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1 Owlstone Road, Cambridge

NEEDHAM

25th. May, 1941

tel. 2183

My Dear Charles Singer:

Many thanks for your nice letter; we were so glad to hear from you and about your new book. I do not think very highly of the RS actually, or of their method of elections. You ought to have been put in many years ago under one statute or another instead of the various stuffed-shirts who are introduced as men useful to, and interested in, science. Still as it is, for a researcher, definitely unpleasant to be out, after a certain point, <sup>rather</sup> than pleasant to be in, I'm glad it happened; and of course the historical associations are delightful. My new book, "Biochemistry & Morphogenesis", is now in complete page proof, and I hope this will all be done before many weeks are past; only the examinations are holding it up. I corrected the galleys in the U.S., where I was till November last, and had a micro-film of them made to leave at Yale, before returning across the Atlantic. Here everything is remarkably quiet, and masses of research (largely connected with the "war effort") going on. At Caius we have dear old Sherrington (one of our Hon. Fellows) evacuated, so I sit next him often when I dine in. He certainly is a charmer. Dophi & I would very much like to take advantage of your kind invitation to stay with you & Dorothea some time this year; may we write again and suggest some time which would be feasible for us ?

Ever yrs. affectionately,

Joseph



2.2.1943

My dear Joseph;

We are thinking much of you and delighted to hear from Dophi this morning a little of what you have been achieving. We do look forward to hearing of your safe arrival at Chungking for the splendid work that you are doing.

The following tiny note may possibly be of interest to you though you probably know all about it.

The Spanish Benedictine humanist Benito Geronimo Feyjoo

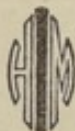
Legro (1676-1764) makes the statement that the Chinese  
"the reign of King Hoanti four centuries before the Flood"  
knew both of the circulation of the blood and also knew how  
to recognise diseases by the pulse. This statement occurs  
in Feyjoo's work "Teatro Critico Universal" first published  
in 8 volumes between 1726 and 1739. The British Museum has  
only a later edition of Madrid, 1773, and this passage occurs  
there on page 315.

Many best greetings from us both. We are much  
hoping to see Dophi before long.

Yours very sincerely,

Mrs Charles Singer.





# HOTEL MIDTOWN

BROADWAY & 61st STREET

NEW YORK CITY

28th. Dec. 1942

Dear Charles & Dorothea Singer:

I am waiting here, all packed up, for the word to proceed further on my mission, having successfully accomplished all the work that had to be done in Washington. In the meantime I am improving the occasion by using the fine Asiatic library of Columbia Univ., the sort of thing one could not do in all places where one might be temporarily detained.

I wish I could talk with you both, esp. Dorothea, about the origin of alchemy. You know, of course, all the papers of Temey Davis and his Chinese collaborators on Chinese alchemy. (Dophi is receiving some copies of a bibliography of it, and would send you one, if desired). A paper by W.J. Wilson which I have just been reading, gives all the usual discussions about "the land of Khem", the Egyptian word "qem" meaning black, etc. the original form of the Gk. word  $\chi\upsilon\mu\epsilon\iota\alpha$ , the possible existence of a person called Chemes, the possible transposition of consonants from  $\mu\omicron\lambda\chi\epsilon\iota\alpha$  to  $\chi\omicron\lambda\mu\epsilon\iota\alpha$ , and finally the old Gk. word  $\chi\upsilon\mu\alpha$  meaning an ingot. I never feel that any of these are very convincing.

As is well known, Chinese alchemy, associated with Taoism, is ancient, and indeed the first printed book on it, by Wei Po-Yang, goes back to 142 A.D. The words for alchemy are 鍊金術 lien ch'in shu, lit. the art, mystery, magic or deception, of transmuting (things into) gold. Thinking it over with Lu Gwei-Djen the other evening, it suddenly struck us that the Cantonese or South Chinese way of saying ch'in (gold) is kim - most suspiciously like what we are looking for.

金



Tenney Davis does, of course, bring forward a lot of evidence, mostly drawn from the concepts of later European alchemy, that they were derived from Chinese sources. Maybe this suggestion has already occurred to you, but I don't remember it being made either by Waley or Davis.

Write to me c/o Brit. Embassy, Chungking, via Foreign Office, London. Heaven only knows when I shall get back, but before returning to laboratory work I am determined to write my "Sketch of the History of Science and Scientific Thought in China". The more I go into it the more fascinating it is, and the less ordinary ideas about the Chinese mind seem to have to do with reality! Chu Hsi, for example, the head of the Sung Confucians, about the time of our Norman Conquest, produced a theory of the world closely resembling Democritus-Lucretius or Spencer-Darwin-Huxley, yet without any great backing of ascertained scientific fact. The ability of the Ch. scholars to keep their heads in the midst of Buddhist and other superstition becomes more and more extraordinary.

I hope you can persuade Dophi to pay you a visit at Kilmarth while I'm away.

Ever yours affectionately,

Joseph

Gonville & Caius College, Cambridge

ANTHOLOGY-

28th. August, 1946

tel. 3275

Answered  
24.9.46

My Dear Charles Singer:

By way of a breadandbutter letter here comes a set of the texts you spoke about as wanting for your forthcoming book on original descriptions of discoveries and inventions. I hope that you will find them the kind of thing you needed. I did them all during one weekend and might be able to find further ones if you let me know.

I also enclose a letter from Chang Tzu-Kung about alum. No doubt you had already had a look at Sino-Iranica of Laufer. Chang's etymology of "fan" is interesting. The character has two wood radicals at the top with two crosses between them, then the radical for great and at the bottom the radical for stone.

I wonder whether you had a discussion with Reymont in Switzerland, and whether the documents I sent reached you and him safely.

With very best affectionate regards from  
to both of you both of us,

Ever Yours,

Joseph



林岩 fan

2 Huntingdon Road, Cambridge  
August 21st, 1946.

My dear Joseph Needham,--

Kindly send the enclosed note along to Professor Singer. It is copied from Laufer's Sino-Iranica with the names of literature in Chinese added.

As I conceive it now, the Chinese word "<sup>林</sup>岩" was most probably coined to denote the stone (salt) obtained from putting wooden rods in its solution, a process quite commonly and especially resorted to in crystallizing alum.  
the use of

Further information concerning this substance in China can be gathered from:

Mei Piao's Shih-yao-Erh-Ya (梅彪: 石药尔雅) of Tang Dynasty

H. C. Chang's Lapidarium Chinoise (章鸿钊: 石雅) published some years ago by the Geological Survey of China, and probably from Chao Yih's Heg-yu-chun Kao (赵翼: 陔余丛考).

I forgot to tell you the other day that I enjoy reading your recent book on "History is on Our Side" immensely. Sometime later I would be writing a review ~~xxxxx~~ of it in Chinese.

I may add that I have moved to the address above, at which you can get in touch with me. I will certainly call on you should I chance to be in London in the near future.

Most sincerely yours,

T. K. Djang  
T. K. Djang.

Dr. Joseph Needham  
UNESCO Preparatory Commission  
46 Belgrave Square  
London, S. W. 1.



Arabia

see also p. 336

From Berthold Laufer: Sino-Iranica, pp. 474-475.  
(Field Museum of Natural History Publication 201, Chicago, 1919)

In regard to alum, F. P. Smith (5) stated that apart from native localities it is also mentioned as reaching China from Persia, K'un-lun, and Ta Ts'in. J. L. Soubeiran (1) says, "L'alun, qui était tiré primitivement de la Perse, est aujourd'hui importé de l'Occident". F. de Mély (2) translates the term Po-se ts'ei fan by "fan violet de Perse." All this is wrong. Hirth (3) noted the difficulty in the case, as alum is not produced in Persia, but principally in Asia Minor. Pliny (4) mentions Spain, Egypt, Armenia, Macedonia, Pontus, and Africa as alum-producing countries. Hirth found in the P'ei-wen-yün-fu a passage from the Hai-yao pên ts'ao, according to which Po-se fan ("Persian alum," as he translates) comes from Ta Ts'in. In his opinion, "Persian alum" is a misnomer, Persia denoting in this case merely the emporium from which the product was shipped to China. The text in question is not peculiar to the Hai-yao-pên-ts'ao of the eighth century, but occurs at a much earlier date in the Kwang-chou-chi, an account of Kwangtung, written under the Tsin dynasty (A.D. 265-419), when the name of Persia was hardly known in China. This work, as quoted in the Chêng-lei-pên-ts'ao, (5) states that kin-sien-fan ("alum with gold threads") is produced in the country Po-se, and in another paragraph that the white alum of Po-se (Po-se pai fan) comes from Ta Ts'in (6). The former statement clearly alludes to the alum discolored by impurities, as still found in several localities of India and Upper Burma. (7) Accordingly the Malayan "Po-se" (for this one only can come into question here) produced an impure kind of alum, and simultaneously was the transit mart for the pure white alum brought from western Asia by way of India to China. It is clear that, because the native alum of Po-se was previously known, also the West-Asiatic variety was named for Po-se. A parallel to the Po-se fan is the K'un-lun fan, which looks like black mud. (8)

(佩文韻府)

(廣州記)

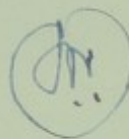
(證類本草)

- (5) Contributions towards the Materia Medica of China, p. 10.  
(1) Etudes sur la matière médicale chinoise (Minéraux), p. 2 (reprint from Journal de pharmacie et de chimie, 1866.)  
2) Lapidaire chinois, p. 260.  
(3) Chinesische Studien, p. 257.  
(4) XXXV, 52.  
(5) Ch. 2, p. 40 b.  
(6) Also in the text of the Hai-yao-pên ta'ao, as reproduced in the Pen-ts'ao-kan-mu (Ch. 11, p. 15b), two Po-se alums are distinguished.  
(7) Watt, Commercial Products of India, p. 61.  
(8) Pen-ts'ao-kan-mu, l. c.  
ix



Passages from the original text prepared for  
use in Dr Charles Singer's collection of texts  
of important discoveries.

- 1) 10th cent. BC Ancient Chinese technology of bronze
- 2) 5th. cent. BC The Taoist Conviction of the Unity of the  
Order of Nature
- 3) 4th. cent. BC Social Significance of Science
- 4) 2nd. cent. BC First known reference to alchemy in any language
- 5) 2nd. cent. AD Excerpts from the earliest known alchemical book  
in any language
- 6) 2nd. cent. AD Invention of Paper
- 7) 2nd. cent. AD Description of the banana
- 8) 1st. cent. AD A Han Dynasty Sceptic
- 9) 4th. cent. AD First recorded use of insects as a weapon in  
plant protection
- 10) 4th. cent. AD Theory and Practice of early Chinese alchemy
- 11) 5th. cent. AD Chinese knowledge of the Mammoth
- 12) 9th. cent. AD First use of block printing
- 13) 10th. cent. AD Discovery and use of gunpowder
- 14) 11th. cent. AD First use of movable-~~block~~ printing type
- 15) 11th. cent. AD First description of the magnetic compass
- 16) 13th. cent. AD First recognition of the nature of fossils
- 17) 12th. cent. AD Excerpt from the classical book on orange  
cultivation
- 18) 13th. cent. AD Part of the most famous Chinese medico-legal  
treatise
- 19) 14th. cent. AD Empirical knowledge of deficiency diseases



Description of passage : Ancient Chinese technology of bronze

Author : Liu Hsiang and Liu Hsin

Date : about 40 BC

Name of Book : Chou Li Kao Kung Chi (Artificers' Record of the  
Rites of the Chou Dynasty)

Translator : M.Chikashige

Reference : "Alchemy and other Chemical Achievements of the  
Ancient Orient",Tokyo,1936

Copper is divided into six,tin occupies one;this is the recipe for bells and tripod-cauldrons. Copper is divided into five,tin occupies one;this is the recipe for axes and hatchets. Copper is divided into four;tin occupies one;this is the recipe for halberds and tridents. Copper is divided into three,tin occupies one;this is the recipe for swords. Copper is divided into five,tin occupies two;this is the recipe for writing knives and arrow-heads. Copper and tin are half and half;this is the recipe for mirrors.

N.B.All the proportions are metallurgically reasonable except the last-named,which as analyses show,was never carried out. Mirrors do not contain beyond 32% of tin. Such Han dynasty specular metal is truly white,reflects without tinning or silvering,is not easily injured by scratching,and remains underground over a thousand years without corrosion.



Description of passage : The Conviction of the Unity of the Order  
of Nature (Taoist school, 4th-5th. century BC)

Book : Chuang Tzu

Date : about 400 BC

Translator : Feng Yo-Lan

Reference : "Chuang Tzu," Shanghai, 1933

Tung Kuo Tzu asked Chuang Tzu "Where is the so-called Tao ?" Chuang Tzu said "Everywhere". The former said "Specify an instance of it." "It is in the ant". "How can the Tao be in anything so lowly ?" "It is also in the wild grasses". "How can it still be lower ?" "It is in that earthenware tile". "How can it still be lower ?" "It is in that dung". To this Tung Kuo Tzu made no reply. Chuang Tzu said "Your questioning does not touch the fundamentals of the Tao. You should not specify any particular thing. There is not a single thing without Tao. There are three terms : complete, all-embracing, and the whole. These three names are different, but denote the same reality - all refer to the one thing."

COPY

24th September, 1946.

Dear Dr. Djang,

I came back from Switzerland last week and found a letter from Joseph Needham enclosing your note on alum from Laufer and also your note on the word FAN. I am most obliged and will certainly have the three books you mention examined. Are they available in a western language? If not could I employ a Chinese to abstract the material that concerns me from them? Can you suggest anyone? I would, of course, pay a reasonable fee.

I am specially anxious to get anything concerning the manufacture of alum. I have hardly any evidence on this from anywhere outside Europe.

Have any ancient Chinese fabrics been examined for alum? It is not a difficult thing to do and any little fragment of say  $\frac{1}{2}$  inch square will suffice. I can always obtain an expert opinion on the point, but to be of any interest the fragment must be dateable within a century or two.

Again many thanks,  
Yours very sincerely,

CHARLES SINGER.

Dr. T.K. Djang,  
2, Huntingdon Road,  
Cambridge.



Description of passage : Social Significance of Science as seen by  
a philosopher of 4th.century BC,critical  
of the Taoist nature-philosophers

Author : Hsün Tzu

Date : Warring States period,4th.century BC

Name of Book : Hsün Tzu

Translator : Lo Chung-Shu

It is not enough just to think about the greatness of Nature;why not gather things and control them ? It is not enough just to follow Nature and glorify it;why not control the course of Nature and utilise it ? It is not enough just to hope for good seasons and wait for them;why not act in response to reason and ~~control~~ make the best use of them ? It is not enough just to want to multiply things;why not use intelligence to transform them ? It is not enough just to think about things as things;why not put things into order and not waste them ? It is not enough just to desire to know the causes of things'coming into being;why not lead things to come to their full development ?

Therefore to neglect human effort and only think about Nature is to misapprehend the true essence of the world.



Description of passage : The first known reference to alchemy in any language (2nd.century BC)

Author : Pan Ku

Date : 1st.century AD

Name of Book : Chien Han Shu (History of the Earlier Han Dynasty)

Translator : L.Wieger

Reference : "Textes Historiques" vol.I,p.443

At that time (133 BC),Li Shao-Chün,who knew how to sacrifice to the stove,and who possessed the art of living without growing old, was received in audience of the Emperor (Han Wu-Ti) who honoured him. Li Shao-Chün dissembled his age and the story of his life,saying always that he was seventy years old. He had the power of commanding things<sup>@</sup> and of avoiding old age. He made a tour of all the feudal lordships in order to become known. He had neither wife nor child. Those who heard that he had power over things and was not subject to death brought him eatables and presents. He always had abundance of gold ingots,money,clothes and food. As people saw that he was provided with everything without working,and no one could understand how,they all had faith in him and disputed among themselves the honour of serving him.....

Li Shao-Chün said to the Emperor "Sacrifice to the stove and you will be able to evoke transcendent beings. When they have come, it will be possible to change the powder of cinnabar into yellow gold. When this gold has been produced,you may have a drinking-vessel made of it. When you have drunk from it you will have the benefit of longevity. Having this you will be able to see the immortals on the island of Peng-Lai in the midst of the sea. When you have seen them you will be able to make the sacrifices Feng and Shan. Having done this you will achieve immortality. Formerly Huang Ti"(the mythical first emperor)"did all this. Myself also,when sailing on the sea, encountered Master An-Chi,an immortal who haunts the isle of Peng-Lai. When it pleases him to speak with men,he is visible,when it does not please him,he remains invisible." After this,the Son of Heaven made the sacrifice to the stove for the first time,and sent magicians to seek for Master An-Chi and the isle of Peng-Lai in the

midst of the sea. He also occupied himself in converting the cinnabar powder and other drugs into yellow gold.

Some time afterwards, Li Shao-Chün fell ill and died. But the Son of Heaven considered that he had merely changed his form and gone away.

@ Compare typical phrases from the book Kuan Tzu, written some time during the warring states period (4th. century BC) by a philosopher of the Taoist school:  
"The Sage commands things, and is not commanded by them",  
"The Sage follows after things, in order that he may control them."



Description of passage : Excerpts from the earliest known alchemical book in any language.

Author : Wei Po-Yang

Date : about 142 AD

Name of Book : Tsan Tung Chi (The Unification of the Three Principles)

Translators : Wu Lu-Chiang and Tenney L. Davis

Reference : Isis 1932, 18, 210

On the sides (of the apparatus) there is the walled enclosure, shaped like a peng-hu pot. Closed on all sides, its interior is made up of intercommunicating labyrinths. The protection is so complete as to turn back all that is devilish or undesirable, and the meandering passages take good care of emergencies....

In order that the treatise on fire shall not have been in vain, I shall explain here in simple language. Like the moon lying on its back is the shape of the furnace and the pot. In it is heated the White Tiger. Mercury Sun is the flowing pearl, and with it is the Blue Dragon. The east and west merge together, and the hun and po (two kinds of souls) control one another .... The Red Bird is the spirit of fire and dispenses a victory or defeat with justice. With the ascending of water comes the vanquishing of fire....

Treatment and mixing will bring about combination and rapid entrance to the scarlet portal. The escape must be firmly blocked. Below plays the dazzling flame, while the Dragon and the Tiger keep up a sustained vociferation. The flame at the start should be weak, so as to be controllable, and should be made strong at the end. Close attention and careful watch should be given so as to regulate properly the heat and the cold .... The colour changes into a purple. Behold, the Returned Medicine is obtained. This is then made into pills. These are extremely efficacious, although their individual size is so small that they occupy only the point of a knife or the edge of a spatula....

Above, cooking and distillation take place in the cauldron; below blazes the riaring fire. The White Tiger goes before, leading the way; following comes the Grey Dragon. The fluttering a Scarlet Bird flies the five colours. Encountering snaring nets, it is help-

lessly and immovably pressed down and cries ~~witth~~ pathetically like a child after its mother. But irrevocably it is put down into the cauldron of hot fluid to the detriment of its feathers. Before half of the time has passed, Dragons appear with rapidity and in great number. The five dazzling colours change ~~dimcassambdq~~ incessantly. Turbulently boils the fluid in the furnace. One after another they appear to form an array as irregular as a dog's teeth. Stalagmites, which are like midwinter icicles, are split out horizontally and vertically. Rocky heights of no apparent regularity make their appearance, supporting one another. When Yin and Yang are properly matched, tranquillity prevails.

N.B. The White Tiger is ~~the~~ mercury, the Grey Dragon is probably sulphur.



Description of Passage : The invention of paper by Tsai Lun in  
105 AD

Author : Fan Yeh

Date : 3rd.century AD

Name of Book : Hou Han Shu (History of the Later Han Dynasty) -  
biographical section

Translator : T.F.Carter

Reference : "The Invention of Printing in China and its  
Spread Westwards" New York,1925,p.3

During the ~~period~~ period Chien-Chu (76-83 AD) Tsai Lun was a member of the Imperial Guard. The Emperor Ho Ti, on coming to the throne, knowing that Tsai Lun was a man full of talent and zeal, appointed him a privy counsellor. In this position he did not hesitate to bestow either praise or blame on His Majesty.

In the ninth year of the period Yung-Yuan ( 97 AD) Tsai Lun became inspector of public works. By his plans and according to his arrangements, engineers and workmen made, always with the best of materials, swords and arms of various sorts. Later generations could do no better than imitate his methods of work.

In ancient times writing was generally on bamboo or on pieces of silk, which were then called "chih". But silk being expensive and bamboo heavy, these two materials were not convenient. Then Tsai Lun thought of using tree bark, hemp, rags, and fish nets. In the first year of the Yuan-Hsing period (105 AD) he made a report to the Emperor on the process of paper-making and received high praise for his ability. From that time on paper has been in use everywhere, and is called the "paper of Marquis Tsai".

Description of passage ; Early botanical knowledge of the Chinese;  
the banana, earliest description

Author : Yang Fu

Date : end of 2nd. century AD

Name of Book : I Wu Chih (Records of Strange Things)

Translator : P.K.Reynolds & Fang Lien-Chih

Reference : Harvard Journ.Asian Stud. 1940, 5, 165

The Pa-Chiao plant has leaves as large as mats. Its stem is like a bamboo shoot. After boiling, the stem breaks into fibres and can be used for weaving cloth. Women weavers make this fibre into fine or coarse linen which is now known as Chiao-Chih (Cochin-China) linen. The centre of the plant is shaped like a garlic-bulb, and is as large as a bowl. There the fruit grows and holds the stem. One stem bears several tens ~~fm~~ of fruits. The fruit has a yellowish-red skin coloured like flame, and when peeled the inside pulp is dark. The pulp is edible and very sweet, like sugar or honey. Four or five of these fruits are enough for a meal. After eating, the flavour lingers on among the teeth. Kan-Chiao is another name for it.



Description of passage : A Han Dynasty (1st.century AD) Sceptic

Author : Wang Chung

Date : 27-97 AD

Name of Book : Lun Heng (Discourses Weighed in the Balance)

Translator : E.R.Hughes

Reference : "Chinese Philosophy in Classical Times",Dent,London,  
1942

At the height of summer thunder and lightning come with tremendous force,splitting trees,demolishing houses,and from time to time killing people. The common idea is that this splitting of trees and demolishing of houses is due to Heaven setting a dragon to work. And when the thunder and lightning rush on people and kill them,this is described as due to hidden faults,for example,people eating unclean things,so that Heaven in its anger strikes them and kills them. The roar of thunder is the voice of Heaven's anger,like men gasping with rage. Ignorant and learned alike talk thus,making inferences from the ways of men (to those of Heaven) in order to make sense of what happens.

This is all nonsense. The genesis of thunder is one particular kind of vital energy (chi),one particular kind of sound. Its splitting of trees and demolishing of houses is one with the the rushing on men and the killing of them. At the same time as the killing occurs the splitting and demolishing. Are we then only to ascribe the latter as Heaven's setting of a dragon to ~~work~~ work;and the killing of men to hidden faults ? A dragon at work would be auspicious,and would not give rise to an inauspicious event. For the two to be at the same time and have a common sound cannot be true.

Description of passage : First recorded use of insects as a weapon  
in economic entomology and plant protection.

Author : Chi Han

Date : 304 AD

Name of Book : Nan Fang Tsao Mu Chuang (Description of Plants and  
Trees of the Southern Regions)

Translator : M.J.Hagerty

Reference : H.S.Reed, "History of the Plant Sciences" Waltham, 1942

The Kan orange (Citrus nobilis) belongs to the chü class (Citrus sinensis). It has a sweet delicious flavour which is especially remarkable. There are both yellow and deep red fruits. The deep red ones are called hu-kan, or pot mandarin oranges. The people of Chiao-Chih use mat bags in which they store ants and sell them in the market. The nests of these ants are like thin silken floss. The mat bags are attached to the branches and leaves, and when the ants are inside they are removed and sold in the market. These ants are of a reddish-yellow colour and larger than ordinary ants. In the southern regions, if the trees are without these ants, their fruit will be injured by swarms of boring insects, and there will not be one perfect.



Description of passage : Theory and Practice of early Chinese  
alchemy (4th.century AD)

Author : Ko Hung

Date : between 317 and 332 AD

Name of Book : Pao-Pu-Tzu (Book of the Solemn-Seeming Philosopher)

Translators: Wu Lu-Chiang ~~and~~ & Tenney L.Davis ; M.Chikashige

References : Proc.Amer.Acad.Arts & Sci.1935,70,240  
"Alchemy and other Chemical Achievements of the  
Ancient Orient",Tokyo,1936

The scientific mind feeling its way forward :-

Someone said to Ko Hung "Even Pan Ti could not make a sharp needle out of stone. Even Eo Yeh could not weld a fine blade out of lead or tin. The very gods cannot make possible what is really impossible;the very universe cannot do what cannot be done. How is it possible for us human beings to give constant youth to one who must grow old,or confer eternal life on one who must die ? And yet you say that by the power of alchemy you can cause a cicada to live for a year and an ephemeral mushroom to survive for many months. Don't you think you are wrong ?" Pao-pu-tzu answered "The roaring thunder is inaudible to the deaf,the brilliant sun is invisible to the blind. Is it right then to say that the thunder is quiet and the sun pale ? And yet the deaf say there is no roar,the blind say there is nothing. Still less can they appreciate the harmony of music or the splendour of the emperor's robes.... A mind which has become a prey to imbecility will reject even Chou Kung or Confucius, not to speak of the the teaching of the Hsien. The opposition of ~~and~~ life to death,or beginning to end,is in fact only a feature of all natural phenomena. When scrutinised in detail,however,they sometimes reveal that there is no such opposition. Indeed the diversity is boundless,and some things which appear different are in fact the same. Sweeping laws should not be formulated too soon. Things which have a beginning generally have an end also,but there is no universal law about this. It may be said that everything grows in summer, but garlic and wheat fade then. It may be said that everything withers in winter,but bamboos and pines flourish then. It may be



said that everything comes to an end, as it begins, but heaven and earth have no end. It is generally said that life is followed by death, but tortoises and cranes live for ever. In the summer the weather ought to be hot, but we often have cool days; so also we may have mild days in winter. A hundred rivers flow east, but one large river flows north. The earth by nature is quiet, but sometimes it trembles and crumbles. Water by nature is cool, but there are hot springs at Wen Ku. Fire is hot by nature but there is a cool flame upon Hsiao Chiu Hill (natural gas?). Heavy matter ought to sink in water, but there are floating hills of stone in the south seas (islands of matted vegetation?). Light matter ought to float, but there is in Tsang Ko a stream in which a feather sinks ("weak water" - natural light fraction petroleum seepages). If a generalisation is driven too far it always ends in error, as these examples show. Thus it is not to be wondered at that the Hsien does not die like other human beings.

Another person said "It may be admitted that the Hsien differs very much from an ordinary ~~person~~ man, but just as the pine compared with other plants is endowed with extremely long life, so may not the longevity of the Hsien as exemplified in Laotzu and Peng Tsu be after all a gift from Nature? We can not believe that anyone could learn to acquire longevity such as theirs." Ko Hung replied "Of course the pine belongs to a kind different from other trees. But as to Laotzu and Peng Tsu, they were equally human beings. Since they could live so long, so also can we. I have the art of preparing the elixir by means of which one can enjoy everlasting life." Being still unsatisfied, someone protested "If the medicine you employ were of the same substance as our bodies it might be efficacious, but I shall never be convinced of the efficacy of a medicine of quite different origin." Ko Hung replied "If you drink an extract of hair and skin it will not cure your baldness. This proves the inefficacy of things ~~mm~~ of the same nature as our body. On the other hand we can live on grain.



This proves that something of a different nature can have medicinal effect. Thus we see that the effect of a medicine has nothing to do with whether it is of the same nature as our bodies or not.

A practical instruction ~~mm~~ for making gold :-

The first medicine is called Tan Hua. One must first prepare Hsuan Huang (the mysterious yellow). Mix several dozen pounds each of hsiung-huang-shui (orpiment and salt-petre treated with vinegar), fan-shih-shui (solution of alum or copper sulphate), rjung-yen (rock salt or carnallite), lu-yen (ammonium chloride, urea and other substances prepared from human urine), fan-shih (alum), mu-li (calcined eggshells), chih-shih-chih (a kind of earth), hua-shih (talc), and hu-fen (lead carbonate). The mixture is then sealed with Six-One Mud (luting of the vessel). The medicine obtained by thirty-six days' heating will confer immortality on the eater in seven days. When mixed with black fat and heated in a strong flame, the medicine will soon turn to yellow gold. This may also be obtained by heating two hundred and forty ounces of the medicine with one hundred pounds of quicksilver. If yellow gold fails to appear, repeat the heating, and it will then be obtained without fail.

N.B. Chikashige adduces ~~n~~ evidence that the chih-shih-chih mentioned above was a siliceous gold ore, in which case small amounts of gold may well have been obtained at the end of an unconsciously overcomplicated process.

Description of passages: Chinese knowledge of the Mammoth

Author : ascribed to Tungfang So of the Earlier Han Dynasty, ca. 150BC  
& Date : actually a writer in the 4th. or 5th. century AD

Name of Book : Shen I Ching ( Book of Strange Things and Spirits)

Translator : B. Laufer

Reference : Field Museum of Natural History, Chicago, Anthropology  
Leaflet No. 21, 1925

In the regions of the north, where the ice is piled up over a stretch of country ten thousand miles long and reaches a thickness of a thousand feet, there is a rodent, called chi-shu, living beneath the ice in the interior of the earth. In shape it is like a rodent, and subsists on herbs and trees. Its flesh weighs a thousand pounds and may be ~~manam~~ used as dried meat for food; it is eaten to cool the body. Its hair is about eight feet in length, and is made into rugs, which are used as bedding and to keep out the cold. The hide of the animal yields a covering for drums, the sound of which is audible over a distance of a thousand miles. Its hair is bound to attract rats; wherever it is, rats will flock together.

Author, Book, and Date : The Manchu envoy, Tulishen, writing of Yenisseisk in his memoirs, 1715 AD

In the coldest parts of this northern country is found a species of animal which burrows under the ground and which dies when exposed to sun and air. It is of enormous size and weighs ten thousand pounds. Its bones are very white and bright like ivory. It is not by nature a powerful animal and is therefore not very ferocious. It generally occurs on the banks of rivers. The Russians collect the bones of this animal in order to make cups, saucers, combs, and other small articles. The flesh of the animal is of a very cooling quality, and is eaten as a remedy in fevers. The foreign name of this animal is mo-men-to-wa; we call it chi-shu.



Description of passage : Accounts of the first use of block printing ~~in~~ towards the end of the Tang Dynasty. These are the earliest known.

Author : Liu Pin

Date : end of 9th.century AD

Name of Book : Chia Hsün Hsu (Family Instructions)

Translator : T.F.Carter

Reference : "The Invention of Printing in China and its Spread Westwards" New York,1925,p.44

In the summer of the year 883 AD,during my three years' sojourn with the Emperor (Hsi Tsung) in the province of Shu (Szechuan),I was examining books on the south-east side of the imperial residence on behalf of an official named Hsün Hsiu. The books consisted mostly of works on Yin-Yang (natural philosophy or divination),portents,dreams,Feng-Shui (geomancy),and writings of the Chiu-Kung # school (colour arrangements connected with the Eight Trigrams) and the Five-Planet sect. But there were also some character books (copy books for learning penmanship ?) and elementary school-books. Most of these books were printed with blocks on paper,but they were so smeared and blotted that they were not readily legible.

Authors : Wang Hsin-Rjo and Yang Yi

Date : 1005 AD

Name of Book : Tse Fu Yuen Kuei (encyclopaedia)

Translator and Reference,as above,p.213

Feng Tao (b.about 900 AD),Prime Minister of the Later Tang Dynasty,and Li Yu,wished to do honour to the ancient classical learning. They said "During the Han Dynasty Confucian scholars were honoured and the Classics were cut in stone in three different scripts. In Tang time the Imperial College also made stone inscriptions of the text of the Classics. Our dynasty has too many other things to do,and cannot undertake such a task as to have stone inscriptions erected. We have seen,however,men from Wu and Shu who sold books that were printed from blocks of wood. There were







Description of passages: Earliest references to Gunpowder and its use in war.

Books : Sung Shih Ping Chih (Military Records of the Sung Dynasty)  
about 1150 AD  
Sung Shih (History of the Sung Dynasty) by Tou Tou -do-  
Wu Ching Tsung Yao (Compendium of the Military Art)  
by Tseng Kung-Liang and others,  
1044 AD

Translator : Wang Ling

In the second year of the Kai-Pao period (969 AD) Yo Yi-Fang presented a certain type of fire-arrow to the emperor and was rewarded with a gift of silk, (huoyao pienchien, gunpowder whip arrows).

In the third year of the Kai-Pao period (970 AD) of the reign of Sung Tai-Tsu, the general Feng Chi-Sheng, together with some other officers, suggested a new model of fire-arrow. The emperor had it tested, and the trials proving successful, presents of silk gowns were bestowed upon the inventors.

(These fire-arrows were almost certainly rockets)

In the fifth year of Chun-Hua (994 AD) an army of 100,000 men besieged the city of Tsu-Tung. Fierce attacks were made and the inhabitants were greatly alarmed. Chang Yung ordered the hurling of stones from catapults, and at the same time fire-arrows were shot off, whereupon the enemy retreated.

In the third year of Hsien-Ping (1000 AD) Tang Fu, a certain captain in the navy, presented new models of the fire-arrow, the fire-ball, and the barbed fire-ball, to the emperor. A reward of money was given him. (These were certainly grenades or bombs shot from catapults).

(Gunpowder formula of 1040 AD) Take 1 lb. 14 ozs. of sulphur,  $2\frac{1}{2}$  lbs. of saltpetre, 5 ounces of charcoal,  $2\frac{1}{2}$  ounces of pitch, and  $2\frac{1}{2}$  ounces of dried varnish; powder and mix. Then mix 2 ozs. of dried plant material, 5 ozs. of tung oil, and  $2\frac{1}{2}$  ozs. of wax to form a paste. Then mix all ingredients together, slowly stirring. Then wrap the mixture into a parcel with five layers of paper, fasten it with hempen thread, and put some melted pitch and wax on the surface (to protect it from damp).

(The exact sequence of events is still very obscure, but Chen Kuei, co-author of the Shou Cheng Lu (Record of the Defence of Cities), published in 1172 AD, is said to have invented a ~~mm~~ huo-chiang, or fire-gun, a long bamboo tube filled with explosive powder - this, however, seems to have been something in the nature of a flame-thrower. In 1233 AD the Chin Tartars were using a similar projector made of layers of paper, like a modern firework. The first such projector using bullets seems to have been the Tu Huo Chiang of 1259 AD which had a bamboo barrel. About 1275 AD ~~mm~~ Hui-hui Pao ~~mmmm~~ (Moslem guns) were first used, in the sieges of Fan-Cheng and Hsiang-Yang under Chang Chun-Tso. It is probable, though not yet certain, that their barrels were made of metal. After the end of the thirteenth century mentions of guns closely resembling those of modern times, occur more and more frequently.)

About the year 1245 AD, the Sung Prime Minister, ~~mmmm~~ Chao Kuei, reared four tigers, which were kept in a palisade beside the arsenal. On a certain day, while gunpowder was being dried, a fire broke out, and a terrible explosion followed. The ground trembled and houses collapsed. The four tigers were killed instantly. The news rapidly spread and it was considered a marvel. (Chou ~~mmmm~~ Mi's Kuei Hsin Tsa Shih (Record of Miscellaneous Matters), early 14th. century).



Description of passage : First account of movable-type printing  
(11th.century AD)

Author : Shen Kua

Date : 1030-1093 AD

Name of Book : Meng Chi Bi Tan (Dream Pool Essays)

Translators: St.Julien and T.F.Carter

Reference : "The Invention of Printing in China and its Spread  
Westwards" New York,1925,p.160

Under the Tang Dynasty,block printing,though carried on,was not fully developed. In the time of Feng Ying-Wang (Feng Tao),first the Five Classics and then all the ancient canonical works were printed.

During the period Ching-Li (1041-1049 AD) Pi Sheng,a man in cotton cloth (i.e.a man of the common people),made also movable type. His method was as follows :- he took sticky clay and cut in it characters as thin as the edge of a copper coin. Each character formed as it were a single type. He baked them in the fire to make them hard. He had previously prepared an iron plate covered with a mixture of pine resin,wax,and paper ashes. When he wished to print,he took an iron frame and set it on the iron plate. In this he placed the type,set close together. When the frame was full,the whole made one solid block of type. He then placed it near the fire to warm it. When the glue was slightly melted,he took a perfectly smooth board and pressed it over the surface so that the block of type became as even as a whetstone.

If one were to print only two or three copies this method would be neither convenient nor quick. But for printing hundreds or thousands of copies,it was divinely quick. As a rule he kept two frames going. While the impression was being made from one frame, the type were being put in place on the other. When the printing of the first was finished,the second was ready. In this way the two frames alternated and the printing was done with great rapidity.

For each character there were several type,and for certain common characters there were twenty or more type each,in order to be prepared for the repetition of characters on the same page. When



the characters were not in use, he had them arranged with paper labels, one label for each rhyme, and thus kept them in wooden cases. If any rare character appeared that had not been prepared in advance, it was cut as needed and baked with a fire of straw. In a moment it was finished.

The reason why he did not use wood is because the tissue of wood is sometimes coarse and sometimes fine, and wood also absorbs moisture so that the type when set up would be uneven. Also the wood would have stuck in the glue and could not readily have been pulled out. So it was better to use burnt earthenware. When the printing was finished, the frame was again brought near the fire to allow the glue to melt, and then brushed with the hand so that the type fell of themselves and were not in the least soiled.

When Pi Sheng died, his font of type passed into the possession of my followers, and up to this time it has been kept as a precious possession.

N.B. In 1314 AD Wang Cheng, district magistrate of Ching-Teh near Hsuanchow, wrote a book on agriculture and had it printed in movable-block type with the aid of a revolving typesetter's or compositor's cabinet in which the type were kept. He refers to type made from tin. Wooden type of the same date (approximately) have been found at Tunhuang. \* In the first few decades of the 15th. century (1400-1440 AD) a great deal of movable-type printing was done in Korea; for this bronze type were used. In China, no doubt owing to the large number of characters necessary, movable-type printing never displaced block printing - it was easier, as it were, to go straight into stereotypes.



Description of passage : First descriptions of the magnetic compass  
(11th.century AD)

Author : Shen Kua

Date : 1030-1093 AD

Name of Book : Meng Chi Bi Tan (Dream Pool/Essays)

Translators : Alexander Wylie;Tsao Tien-Chin & Joseph Needham

Reference : A.Wylie,"Chinese Researches",Shanghai,1897,p.156

Magicians rub the point of a needle with the lodestone;then it points to the south. But it inclines slightly to the east,and does not point absolutely at the south. If it be made to float on the surface of sufficient water it will easily turn. Or it may be balanced on the finger-nail or on the rim of a cup,but being solid it is liable to fall. It is best to suspend it by a silk fibre attached to the centre of the needle by a piece of wax the size of a mustard-seed,then ~~suspend~~ hanging in a windless place,it will always point to the south. If rubbed in another way it will point to the north,and some needles naturally do so;of these I have some by me. But why the lodestone points to the south,or why the cypress tree points to the west,there is no one who can explain.

(another passage) When a needle is rubbed with the lodestone it points south,but some needles point to the north. Thus needles are not all alike. Just so in the summer the deer shed their horns and in the winter the unicorns do so. Since the south and the north are two opposite principles (as we can see without deep investigation) something like this would be expected.

Author : Chao Rjo-Kua

Date : close to 1250 AD

Name of Book : Chu Fan ~~Records~~ Chi (Records of Foreign Countries)

Translators : F.Hirth & W.W.Rockhill

Reference : "Chau Ju-Kua;his work on the Chinese and Arab trade in the 12th.and 13th.centuries",St.Petersburg,1911, p.176

To the east of Hainan are the thousand-li sandbanks and the

myriad-li rocks, and beyond them is the boundless ocean, where the sea and the sky blend their colours. Passing ships sail only by means of the south-pointing needle - if it be closely watched day and night - for life or death depend on the slightest fraction of error.

N.B. Other early references are as follows :-

Chu Yu in the Pingchow Ko Tan ~~pingchow ko tan~~ (Pingchow Table Talk) of 1119 AD says "The captain ascertains the ship's position, at night by looking at the stars, in the day-time by looking at the sun. When the sun is obscured, they use the south-pointing needle. Or they use a line a hundred feet long with a hook by which they take up mud from the sea-bottom; by its smell they determine their whereabouts."

Hsu Ching, describing his embassy to Korea of ~~hsu ching~~ 1122 AD in the Suan Ho Feng Shih Kaoli Tu Ching of 1167 AD gives a full description of the use of the needle, from which it is clear that the same directional signs as on the geomantic compass were used. This is also shown by ~~hsu ching~~ Chou Ta-Kuan's description of his embassy to Cambodia in the Chen La Feng Tu Chi of 1296 AD.

The first European references are those of Guyot de Provence (1190 AD) and the Cardinal de Vitry (1218 AD). Significantly, they say that the needle points to the south, not the north.



Description of passage : First known recognition of the true nature  
of fossils

Author : Chu Hsi

Date : 1130-1200 AD

Name of Book : Chu Tzu Chuan Shu (Complete Works of Chu Hsi)

Translator : A.Forke

Reference : "The World Conception of the Chinese" London,1925

One frequently sees on high mountains conchs and oyster-shells, sometimes embedded in rocks. These rocks in pristine times were earth, and the shellfish and oysters lived in water. Subsequently everything was inverted; things from the bottom came to the top, and the soft became hard. Careful consideration of these facts will lead to far-reaching conclusions.

Description of passage : Mediaeval botanical knowledge of the Chinese;  
excerpt from the classical book on ~~mangam~~  
orange trees

Author : Han Yen-Chih

Date : 1178 AD

Name of Book : Chü Lu (The Orange Record)

Translator : M.J.Hagerty

Reference : Tung Pao, 1923, 22, 1

The Chen Kan, or true Kan orange, should be classed as very valuable and precious. Its branches, trunk, blossoms, and fruit differ from other varieties, the tree being graceful and its foliage luxuriant. The leaves are narrow and long, and grow very densely, making excellent shade. When in flower it is a tree of great beauty and one which may be admired from a great distance. The fruit, when fully formed, is perfectly spherical with a waxy skin. On the morning of the first frost, the gardener plucks and presents it, "its perfume extends to all the seats of the guests, its fragrant mist sprays upon the people"... This orange is also called the Rju Kan, meaning that its taste is like cream. The skin of the fruit is very thin and has a delicious taste. The vein-like inner skin does not adhere to the pulp segments, so that the pulp may be eaten without any waste. Each orange contains not more than one or two seeds, and many are seedless.



Description of Passage : Part of the most famous Chinese medico-legal treatise, compiled in the Sung (13th. cy) dynasty ~~from the work of~~ and based on earlier work of the Chin and Early Sung dynasties. Similar works in Europe do not appear till two or three centuries later.

Author : Sung Tzu

Date : 1241-1253 AD

Name of Book : Hsi Yuan Lu (Record of the Washing Away of Guilt)  
~~Guilt~~

Translator : H.A.Giles

Reference : Prof.Roy.Soc.Med. 1924, 17, 59

Instructions to Magistrates  
Chap.7 Distinguishing between Real and  
Counterfeit Wounds

In examining a body which is not yet decomposed, pay attention only to such parts as are red, swollen, cut or bruised, discriminating between mortal and non-mortal wounds. Parts which are of a livid or purple colour need not occupy your time, as this hue is common to all bodies in a state of decomposition. Wounds on bones may be of various colours and shades, which are counterfeited in the following manner - red, by taking some genuine safflower, sappan wood, and black plums, making them into an ointment, adding alum, and painting it on the bone, pouring over it boiling vinegar, when a red colour will be obtained of darker or lighter shade exactly like that of a real wound - purple, by taking sappan wood and "earth's blood" and applying as before - dark blue or black, by taking green alum or nutgalls and mixing with vinegar into a thick liquid, regulating the proportions of each according as the shade required is light or dark. Though very deceptive, these counterfeits may be detected by the dullness of their colour, by their being apparent to the touch, and by the absence of the usual halo-like shading off of colour all round. But everything depends on the energy displayed at the time of examination - there must be no carelessness.

Where blows have been given resulting in death, the injured parts will be surrounded by a purple or red halo. If after death lighted bamboo strips have been used to burn a wound, which it is pretended was inflicted before death, the wound will present a scorched appearance, level with the surrounding flesh and not hard to the touch. If the bark of the willow tree be used to make a wound the flesh will be rotten and black, livid all round but without any

swelling, and not hard to the touch. Counterfeit wounds are also made by lighting paper inside a cup and applying it to the flesh; such wounds resemble a blow from a fist, but all round there is a red scorched mark, the flesh inside is yellow, and although it swells, it does not get hard.

All wounds must be determined by the inflammation, which is the gradual diminishing of the wound, change of colour from dark to lighter shades, and lessening of intensity. Also near where the wound ends there should be a halo-like appearance, like rain seen from a distance, or like fleecy clouds, vague and indistinct, fresh-coloured and smooth-looking, a result which should proceed naturally from the infliction of the wound. This is the most important principle of all. If the red is by itself and purple by itself, of a dull colour and collected into one spot, there being, moreover, no halo, then the wounds are counterfeit.

At the time of examination take a piece of white cloth or paper and dip it in the wine or vinegar you are about to use. If the latter have been tampered with, the cloth or paper will change colour.



~~Index~~

Description of passage : Empirical knowledge of deficiency diseases  
in the Yuan Dynasty (14th. century AD)

Author : Hu Sse-Hui

Date : ca. 1320 AD

Name of Book : Yin Shan Cheng Yao (Principles of Correct Diet)

Translators : Lu Gwei-Djen ~~and~~ & Joseph Needham

Reference : text published Commercial Press, Shanghai, 1935

N.B. Hu Sse-Hui, who was Dietitian at the Imperial Court, clearly describes beri-beri, and distinguished between the two forms known today. The acute, or wet, form, he regarded as being due to "fiery chi" (pneuma); the chronic, atrophic, or dry, form, to "cold chi".

For the immediate cure of chou-chi (beri-beri) if due to excess of fiery chi, make a soup of rice and horse-tooth vegetable, and let the patient drink it on an empty stomach early in the morning. Or cook sixteen ounces of pork with one handful of onion, three dried grass-seeds, pepper, fermented beans, and half a pound of rice, and let the patient eat it in the morning. For the cure of chou-chi, if due to excess of cold chi, cook one large carp with half a pound of small red beans, two-tenths of an ounce of the skin of the cheng fruit, the same amount of small dried peppers, and of dried grass-seed; and let the patient eat it. For cases with oedema, stuff one pound of small red beans and five grass-seeds into a duck, and let the patient eat it in the morning.

(The frontispiece of Hu Sse-Hui's book carries the inscription :  
Shih Liao Chu Ping - Food (alone) will cure (many) diseases)



Needham

1 Owlstone Road

Cambridge.

3. 4. 46.

My dear Dorothea,

Very many thanks for your letter,  
& your most kind invitation. I have  
heard that Joseph left Chungking  
& got to Shanghai on March 8<sup>th</sup>.  
This is the first step on his way  
home — he was planning to visit  
briefly Peking, Hongkong & Canton,  
& he remarked vaguely in the telegram  
announcing his arrival in Shanghai  
that he "would be back in a few  
weeks". It is quite possible that  
the Foreign Office has had further  
news & has neglected to tell me,  
but I am hoping to see him here  
any week now.



As you will understand, I can't make any plans until he does arrive now - either to go away before he comes, or for us both after his arrival. But I am sure that, as soon as we can manage it, nothing would be more delightful to us both than a visit to you at Par. So I shall write again later, if I may.

The weather here is grand & Cornwall must be lovely. I am so much enjoying being back at real scientific work, though I feel terribly out of date & out of practice.

I do hope you are all well, & that the work is flourishing.

Yours with love,  
Daphne

1 Owlstone Road, Cambridge

5.9.48

Mii letters  
"Needham"

tel. 2183

My dear Dorothea,

The journey passed off very comfortably & we had a good breakfast at Paddington. We were home by noon, & found Cambridge with blue sky & sun shining.

I can't tell you how much we enjoy visiting you & Charles. Kilmarth in our eyes is a paradise from all points of view. Thank you again for all your kindness.

Joseph rang up just now from College, saying he & Wang Ling are hot on the scent of some of the hares he started at Kilmarth — whether it is the quern or the rudder or the collar harness just now I don't know.



I do hope we shall see you both here before long.

With love from us both to you both,

Daphi.

P.S. The enclosed cheque is for our long-distance telephone calls — I did ascertain the cost & then forgot to give it to you. I am so sorry.

Muse

Hotel Lincoln <sup>[NEEDHAM]</sup>  
Rue Bayard  
Rondpoint des Champs Elyseés  
Paris. 2.4.48

My Dear Dorothea,

Thank you so much for your kind congratulations; it was nice of you to write.

Joseph is handing over to his successor here in a few weeks now, & will be back in Cambridge startup at last on the book Science & Curlyation in China.

We both always so much enjoy visiting you & Charles; if there is any chance this summer, I will write & ask you if you can have us. At any rate,



we ought to meet in May or  
June. If you can pay a  
visit to Cambridge, we should  
be delighted - please let  
us know.

With love & best to you  
both, from Joseph as well,  
Dopshi -

7 NIRE LETTERS NEEDHAM  
1 Owlstone Road, Cambridge

Dec. 17 1950

tel. 2183

My dear Dorothea,

This is to wish you all a very Happy Christmas — I expect you will be having a big family party. I do hope you are keeping well yourself & not getting overtired. I am progressing very well; I am up 9 or 10 hours a day now & find I can do more & more. I expect to give my lectures and practical classes as usual, or nearly so, next term, though I don't suppose I shall start my own experiments just yet.

You said that there was a chance you might



come and visit us in January: I do hope this will materialise. We should both love to have you here & we are well off for help in the house. So please let us know you are coming.

Joseph & I are staying here for Xmas. We have Lu Cwei-Djen, our great Chinese friend, coming from Paris (she came from Shanghai to work with me first in 1937) and after Xmas my sister is coming for a few days while Joseph goes to Paris. We have some wonderful Chinese cooking planned!

Much love from us both to you and Charles, & very best wishes. Doplin.

TABLE OF CHINESE DYNASTIES

	夏 商	HSIA kingdom (legendary, but archaeological finds show that some civilisation existed)		-2000/ca.-1500
		SHANG (= YIN 殷) kingdom (the civilisation of the oracle-bones, names of kings on which confirmed the -2nd.cent.king-lists)		-1500/ca.-1030
	周	CHOU (feudal age)	{ Early Chou period "Spring & Autumn Annals" period 春秋 Warring States period 戰國	-1030/ -722 - 722/ -480 -480 / -221
First Unificatn.	CHHIN dyn. 秦			-221 / -207
	漢	HAN dyn.	{ Former, Earlier, or Western, Han 前漢 HSIN 新 interregnum Latter, Later, or Eastern Han 後漢	-202 / 9 9 / 23 23 / 220
First Partitn.	SAN KUO 三國 (Three Kingdoms) period			221 / 265
			SHU 蜀 221/264 WEI 魏 220/264 WU 吳 222/280	
Second Unificatn.	CHIN dyn. 晉	Western Eastern		265 / 317 317 / 480
		Former, (or Liu 劉) SUNG dyn. 宋		420 / 479
Second Partitn.	Northern and Southern Empires (Nan Pei Chhao 南北朝)			479 / 581
			CHHI dyn. 齊 479/502 LIANG dyn. 梁 502/557 CHHEN dyn. 陳 557/587	
		Northern (Toba) WEI dyn. } Western WEI dyn. } Eastern WEI dyn. }	魏	386/535 535/554 534/543
		Northern CHHI dyn. 北齊		550/577
		Northern CHOU dyn. 北周		557/581
Third Unificatn.	SUI dyn. 隋			581 / 618
	THANG dyn. 唐			618 / 906
Third Partitn.	WU TAI 五代 (Five Dynasties) period (Later Liang, Later Thang, Later Chin, Later Han, and Later Chou)			907 / 960
		-contemporary- LIAO 遼 (Tartar) dyn. West LIAO 遼 HSI HSIA 西夏 (Tangut) State		907 / 1125 1125 / 1168 990 / 1227
Fourth Unificatn.	Northern SUNG 宋 dyn.			960 / 1126
	Southern SUNG 宋 dyn.			1127 / 1279
		CHIN 金 (Nuchen Tartar) State		1125 / 1234
	YUAN 元 (Mongol) dyn.			1260 / 1368
	MING 明 dyn. (approximately 1600 may be taken as the beginning of the Jesuit influence)			1368 / 1644
	CHHING 清 (Manchu) dyn.			1644 / 1911
	Republic 民國			1912 /



BRITAIN-CHINA  
FRIENDSHIP ASSOCIATION

17 BISHOPS BRIDGE ROAD, LONDON, W.2

Secretary: J. Dribbon

Tel.: Ambassador 6372

Dr.D.Singer ,  
Kilmarth ,  
Par ,  
Cornwall .

23rd January 1951.

Dear Dr.Singer ,

Dr.Needham has informed me that you are desirous of joining this Association and asked me to send you the enclosed application form . I can assure you that my Committee would warmly appreciate your membership and also any assistance in developing our work in your part of the country . We are certainly very weak in the West-country and any suggestions you might care to make will receive our serious consideration .

I thank you for passing on the names of your friends and I am writing to them by this same post .

Yours sincerely ,

*Jack Dribbon*  
Secretary .

495

17 BISHOP'S BRIDGE ROAD,  
LONDON, W.2.

22/9/

1952

£ 2 s. 0 d. 0

Rec'd from

Mrs Dorothy W. Suiger  
Cornwall

For BRITAIN-CHINA FRIENDSHIP  
ASSOCIATION

A/c Donation





BRITAIN - CHINA  
FRIENDSHIP ASSOCIATION

17, BISHOP'S BRIDGE ROAD, LONDON, W.2      Tel. Ambassador 1431-2

PRESIDENT: DR. JOSEPH NEEDHAM, F.R.S.

*Treasurer:*  
Mr. G. J. JAMIESON

*Chairman:*  
Mr. W. J. ELLERBY

*Secretary:*  
Mr. J. DRIBBON

JD/WB.

23rd September, 1952.

Mrs. Dorothy W. Singer,  
Kilmarth,  
Par.  
CORNWALL.

Dear Mrs. Singer,

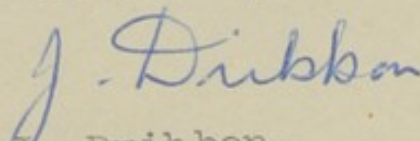
Thank you very much indeed for your letter of the 18th instant and your very generous donation. Our receipt is enclosed herewith.

We have been going through a particularly difficult time financially having had heavy outlay on two pamphlets published recently for which returns are slow. Coupled with this, the summer season is a traditionally difficult time where money is concerned.

However, the rallying round of kind friends like Mrs. Needham and yourself have helped us to meet our creditors and keep on our staff for the intense activity planned for the autumn.

With very best wishes,

Yours sincerely,

  
J. Dribbon.  
Secretary.

BRITAIN-CHINA FRIENDSHIP ASSOCIATION

17 Bishop's Bridge Rd., London, W.2.

APPLICATION FOR MEMBERSHIP

I enclose £. s. d. for.....membership. (Please state whether A, B or C membership).

Name.....

Address.....

- NOTE:-
- A membership is ordinary membership, costing 2/6d per year
  - B membership includes the right to receive all publications of the Association and costs One Guinea a year
  - C membership is life membership, including the right to receive all publications of the Association and costs Ten Guineas

Cheques and Postal Orders should be crossed and made payable to the Britain-China Friendship Association.



BRITAIN-CHINA  
FRIENDSHIP ASSOCIATION

17 BISHOPS BRIDGE ROAD, LONDON, W.2. Tel.: Ambassador 6372

PRESIDENT: Dr. JOSEPH NEEDHAM, F.R.S.

*Treasurer:*  
Mr. G. J. JAMIESON

*Chairman:*  
Mr. W. J. ELLERBY

*Secretary:*  
Mr. J. DRIBBON

JD/EMM

21st February, 1951.

Mrs. D. W. Singer,  
Kilmarth,  
Par,  
CORNWALL.

Dear Mrs. Singer,

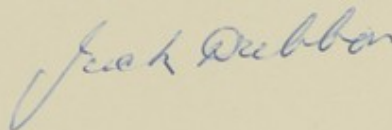
Please accept my apologies for the delay in replying to your letter of the 1st instant. We have been very busy on matters connected with our A.G.M. and also National Conference which is being held in April.

Please accept our very warm thanks for your very good support and good wishes.

You mention your donation as being towards the work of the Association and not as membership fees. However, we are placing you on our mailing list for all material which we issue.

Should I have misunderstood your letter and the cheque was for membership - please let me know.

Yours sincerely,



Secretary.

CHINA

8th March, 1951.

Dear Mr. Dribbon,

It is so kind of you to have sent me a second receipt for my little subscription together with a membership form. I am not really asking to join your Society because it happens that I am very ignorant of Chinese matters; but that does not prevent my warm gratitude for the admirable and courageous work of the Society to try to avert war with China now.

Mr. and Mrs. Needham told me that funds are still badly needed and I have pleasure in sending the enclosed small supplementary cheque of one guinea.

Yours faithfully,

Mrs Charles Singer

The Secretary,  
British China Funds Association,  
17 Bishops Bridge Road,  
London. W.2.



FROM JOSEPH NEEDHAM HIST CHINESE SCIENCE

§ ON UNITY & SPONTANEITY OF NATURE IN CAP ON TAOIST PHILOSOPHY  
(Last page on Unity)

QUOTES:

" If a man sleeps in a damp place, he gets lumbago and  
ma die. But what about an eel ? And living up a tree is frighter  
ing and tiring to the nerves . But what about monkeys ? What  
habitat can be said to be 'absolutely' 'right' ?....  
In my opinion, the doctrines o benevolence and righteousness  
and the paths of right and wrong are inestricably confused"  
from Chuang Tzu ch.2 (Legge ,i,192

and JN sa s there are parallel passages both in the  
Chuang Tzu and elsewhere.

Taoist belief that  
JN quotes this re/"Ultimate benevolence requires  
provisional non-benevolence"

[ i.e. ~~XXXXXXXX~~ Papal & Commuhist "End justifies the means"]

"We are now in a position to ask a central question, what was the main motive of the Taoist philosophers in wishing to engage in the observation of Nature? There can be little doubt that it was in order to gain that peace of mind which comes from having formulated a theory or hypothesis, however provisional, about the terrifying manifestations of the natural world surrounding and penetrating the frail structure of human society. Whether the phenomena be those of natural convulsions, earthquakes, eruptions, storms or floods; or of the varied forms of disease; man at the beginning of the path of science feels stronger and more confident when once he has differentiated and classified them, and especially named them and formulated naturalistic theories about them, their origins, nature, and likely future incidence. This distinctively scientific peace of mind the Chinese knew as ching hsing 靜心. The atomistic followers of Democritus and the Epicureans knew it as *ἀταραξία* ataraxy. We have already noticed the story of the man of the State of Chhi, in Lieh Tzu, who was afraid that the sky would collapse. This parable was by no means the joke that so many have taken it to be; reflective spirits who were not content with Confucian concentration on the affairs of human society stood in great need of assurance, and the Taoists, like the Epicureans, were determined to "pass beyond the flaming ramparts of the world" to seek it."

J.N.



16th June 1955

The first volume of Science & Civilization in China by Dr. Joseph Needham, F.R.S., was published eight months ago. Volume II will appear this year. Volumes III and IV are well advanced, and Volumes V - VII are planned and will complete the work. We need not stress the significance for social science of these historical aspects of the only continuous and unified civilization with which those of the Near East and Europe can be reasonably compared. Dr. Needham's project is one of the most important in the whole range of humanistic and social studies that is before the learned world.

Dr. Needham is uniquely equipped for this task by a combination of special scientific training and experience, by previous research in the history of science, by prolonged residence in China, and by extensive technological, social, and linguistic study. To maintain the momentum of the work it is necessary for Dr. Needham to have the help of a Chinese assistant, whose salary together with certain other incidental expenses are at present being borne by Dr. Needham. The project will, it is estimated, be completed in about five years. Dr. Needham will, for all this period, need a suitable assistant and a certain amount of other clerical and literary aid.

We would suggest to the Nuffield Trustees that they allocate to Dr. Needham for his project £1,000 a year for five years, the greater part for the salary of an assistant. We would be obliged if the Trustees would address correspondence to Professor Charles Singer, 'A History of Technology', Thames House, Millbank, London S.W.1, who is acting as secretary to the group of appellants.

*George Sanson*

BRATTON HOUSE,  
WESTBURY, WILTSHIRE.  
BRATTON 231.

June 19th, 1955.

Dear Dr. Singer:-

I have signed and return the document enclosed in your letter of June 16th (CS:EH) - though I hope no one will ask my qualifications for expressing these opinions.

Yours sincerely,

*Grace Seymour*



16th June 1955

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*Alan Seymour*

SCHOOL OF ORIENTAL AND AFRICAN STUDIES

UNIVERSITY OF LONDON, W.C.1

DEPARTMENT OF THE FAR EAST

PROFESSOR W. SIMON

Telephone: MUSEUM 2023/4

Telegrams: SOASUL, PHONE, LONDON

WS/JED/530

22nd June, 1955.

Dear Professor Singer,

Thank you for your letter of 16th June.  
Enclosed please find your appeal, duly signed  
by me.

Yours sincerely,

*W. Simon*

Professor Charles Singer,  
Thames House,  
Millbank,  
London, S.W.1.



16th June 1955

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W. Simon

Room 160,

//

CS:EH

5th July 1955

My dear van der Sprenkel,

Many thanks for your letter  
and signature to the appeal to the  
Nuffield Trustees.

I had, of course, added your  
name, knowing that the matter was  
as you wished.

Yours sincerely,

CHARLES SINGER

O. P. N. B. van der Sprenkel Esq.  
Department of Oriental History  
School of Oriental & African Studies  
University of London  
London, W.C.1



1 TANZA ROAD · LONDON · NW3

*Tel. Hampstead 7972*

30 June 1955

Dear Dr. Singer,

I must apologise for my delay in returning the enclosed signed letter to you, but I have been out of town, and this was not forwarded. I very much hope the application will be successful. If it is not, or only partially so, there will, I think, be a chance of our obtaining some financial assistance for Joseph Needham from the Universities China Committee, as in last Tuesday's elections to the Executive Council four additional 'pro-Needham' academics were elected to it: Wu Shih-chang of Oxford, van der Loon of Cambridge, and Walter Simon and I from London. Together with Dawson of Durham and Pulleyblank of Cambridge, who were already members, we will now have six of the twelve members of the Council on our side if the matter should be raised again. Please treat this information as confidential

for the moment. If an appeal to the U.C.C. should prove desirable, it would be as well that it came from an influential outside source - for instance the group for which you are already so kindly acting as secretary. Should the question arise, we could perhaps have a talk about it.

yours sincerely,

Otto B. van der Sprenkel



16th June 1955

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Otto P. N. B. van der Sprentkel

Dept. of Oriental History, School of Oriental and African Studies, Univ. of London.

16th June 1955

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*Arthur Waley*



*From*

MARGERY FRY,

48 CLARENDON ROAD

LONDON, W.11.

Telephone : PARK 4942.

---

22nd June /55

Miss Fry is away from home for three weeks, and I have forwarded your letter on to her.

Yours truly,

*Mabber*

Secretary

POST CARD

THE ADDRESS TO BE WRITTEN ON THIS SIDE



Charles Singer Esq.,  
Room 160  
North Block  
Thames House  
Millbank S.W.1.



16th June 1955

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I agree  
A.F. Whyte

[Sir Edmund Whyte R.C.S.I.]



SINO-BRITISH FELLOWSHIP TRUST

ALL COMMUNICATIONS TO:  
THE HONORARY SECRETARY  
M<sup>RS</sup> C. FRANKLAND MOORE, M.B.E.

TELEPHONE: WESTERN 4533

31, PEMBROKE ROAD  
KENSINGTON  
LONDON, W. 8

CS/EH  
VEM/VHR

10th June, 1955.

Dear Mr. Singer,

Thank you so much for your letter of the 3rd June regarding the case of Mr. Wang Ling and I am sorry that I have not answered this before.

Actually Lady Violet Seymour wrote to us on the 21st May giving us a brief outline of the history of Mr. Wang Ling.

I will certainly take the very earliest opportunity of placing the matter before the Council of the Trust and as soon as I have their decision I will communicate with you again.

Yours sincerely,

V. Elizabeth Moore.  
HON. SECRETARY.

Charles Singer Esq.,  
Room 160,  
North Block,  
Thames House,  
Millbank,  
LONDON, S.W.1.



Room 160,

-----  
CS:EH

3rd June 1955

Dear Sir Horace,

I have today sent a letter, of which I enclose a copy, to Mrs. Frankland Moore.

I agree with you that it does not altogether fit this particular case, but it seems to me that it would be very difficult to find one that does fit exactly the conditions laid down in the circular issued by the Sino-British Fellowship Trust. I think Wang Ling comes as near to it as anyone is likely to come and at any rate we can wait for a reply.

Meantime, I have had quite a number of favourable answers and I am meeting Otto van der Sprekel next Tuesday.

Yours sincerely,

CHARLES SINGER

Sir Horace Seymour, G.C.M.G., C.V.O.  
Bratton House  
Westbury, Wilts.

Room 160,

-----  
CS:EH

3rd June 1955

Dear Madam,

You have doubtless seen the work by Dr. Joseph Needham and Mr. Wang Ling : Science and Technology in China, of which the first volume has appeared and the second volume is in the press and will be available quite soon. I understand that the third and fourth volumes will also appear before very long.

Mr. Wang Ling is, at the moment, a candidate for the Ph.D. of Cambridge and I think he will most probably be awarded that degree this summer. At present he is having his expenses paid by Dr. Needham himself. I am extremely interested in this project on general grounds of scholarship. To be able to compare the cultural history of Chinese civilisation with that of the West seems to me to be a matter of the very utmost importance and interest. I can hardly imagine anything that would be educationally more significant.

Sir Horace Seymour has forwarded me the fellowship regulations of the Sino-British Fellowship Trust. It seems to me that the case of Mr. Wang Ling might reasonably be included under the heading "Educational : Teaching of Adults, including Mass Education". The work will doubtless be translated into Chinese and thus will come under this heading both in the East and in the West.

As regards the general considerations governing fellowship, I may say

- (1) that Mr. Wang Ling is over 27;
- (2) that he is likely shortly to hold a University degree;
- (3) that although he has studied abroad (that is out of China), his study is continuous and will continue;



- (4) that he is unmarried;
- (5) is obviously fulfilled, as are (6), (7), (8) and (9);
- (10) would certainly be fulfilled if it were possible; and
- (11) does not arise.

Do you think, under the circumstances, that Mr. Wang Ling should be considered? My interest in the matter is entirely from the point of view of the general advancement of learning.

Yours faithfully,

CHARLES SINGER

Mrs. C. Frankland Moore, M.B.E.  
The Honorary Secretary  
Sino-British Fellowship Trust  
31 Pembroke Road  
Kensington  
London, W.8

(copy to Sir  
Horace Seymour)

BRATTON HOUSE,  
WESTBURY, WILTSHIRE.

BRATTON 231.

May 30. 1955.

Dear Mr. Singer:-

Here are some papers  
from Wm. Moore. On reading  
the regulations it seems  
unlikely that J. V.'s man  
could be made to fit  
into them, I fear.

Yrs sincerely,

Trace Seymour





SINO-BRITISH FELLOWSHIP TRUST

ALL COMMUNICATIONS TO:  
THE HONORARY SECRETARY  
M<sup>RS</sup> C. FRANKLAND MOORE, M.B.E.

TELEPHONE: WESTERN 4533

31, PEMBROKE ROAD  
KENSINGTON  
LONDON, W. 8

VEM/VHR

25th May, 1955.

*Walter Henry Seymour.*

Thank you very much for your letter of the 21st May. It was so nice to hear from you again after so long and I do hope you are enjoying your retirement. It must be very pleasant to be in the country.

I am enclosing some papers in connection with the Sino-British Fellowship Trust, which I think will put you in the picture. The Sino-British Fellowship Trust papers will give you some idea of the scheme operated by the Trust and the copy of the Chairman's Report for 1954-55 will tell you what we have been doing.

I have made a careful note of the address and telephone number of Mr. Charles Singer. I will certainly bring your request to the attention of the Trustees.

I have not heard from Michael for some time, and last year when he was home we tried to arrange a meeting but he seemed to be flying all over the place lecturing. I heard from a friend that he was looking

P.T.O.

much older.

What a pity he does'nt marry; he would make such a nice husband for someone. He always seems to fall in love with the wrong people and anyway no one is prepared to go out to the West Indies with him.

Very kind regards.

James Searis  
V. Elizabeth Moore

V. Elizabeth Moore.  
HON. SECRETARY.

Enc.

Lady Violet Seymour,  
Bratton House,  
WESTBURY,  
Wilts.



## SINO-BRITISH FELLOWSHIP TRUST.

### FELLOWSHIP REGULATIONS.

---

1. The Sino-British Fellowship Trust offers a number of fellowships to Chinese who are eligible to study their particular subject in the United Kingdom.

2. The fellowships are usually tenable for one year and are available for men and women of acknowledged ability and experience in professional or public life, who have held a responsible appointment in a recognised organisation for normally not less than five years, working in the field in which they wish to study **and to which they intend to return.**

3. The fellowships are awarded for study of subjects of a practical nature. Certain fields will be announced yearly and will be chosen from the following subjects :—

- |                         |  |
|-------------------------|--|
| <b>Medical :</b>        | Social Medicine, Tuberculosis and Industrial Medicine<br>(including Hospital Almoner training or Social Service)<br>Orthopaedics including Physiotherapy<br>Rehabilitation of the Sick (including Artificial Limb<br>Making and Occupational Therapy)<br>Health and Hospital Administration<br>Nursing and Midwifery |
| <b>Educational :</b>    | Teaching in Nursery, Infant, Junior and Secondary Schools<br>Teaching of the Deaf, Blind and Crippled<br>Teaching of Adults, including Mass Education<br>Audio-visual Methods in Education   |
| <b>Social Welfare :</b> | Techniques of Social Insurance<br>Training for Social Welfare<br>Child Care and Child Welfare<br>Prison Reform (including Probation and Parole)<br>Police<br>Methods of dealing with Juvenile Delinquency  |
| <b>Labour :</b>         | Industrial Welfare<br>Labour Relations<br>Factory Inspection<br>Employment Service (including Vocational Guidance,<br>Vocational Training and Employment Exchange)<br>Fostering of Rural and Subsidiary Industries   |
| <b>General :</b>        | Civil Administration<br>Town Planning<br>Housing<br>House Property Management  |

4. Because of the nature of the study, it will not always be possible to obtain a diploma in Great Britain.

5. The fellowships cover travel expenses to and from Great Britain, maintenance, pocket money and fees for one year. No grant is made for clothing.

6. Grants will be considered to enable applicants to go to Great Britain where they or their organisations could pay part of the expenses in place of a fellowship covering total expenses.

7. **General Conditions Governing Fellowships :-**

- (1) Candidates must be over 27 years of age and in a good state of health.
- (2) Candidates need not necessarily hold a University or College degree but they should have had a sound education and must speak and write English.
- (3) Preference will be given to those who have not previously studied abroad.
- (4) No fellow may take his wife or other member of his family with him.
- (5) Fellows must agree to work diligently at their studies and to follow the Course arranged for them. Any alteration in the Course must be approved by the Committee in London.
- (6) Fellows must report at agreed intervals to the Sino-British Fellowship Trust in London.
- (7) Fellows must abide by the regulations of the organisation or institution with which they work.

- (8) Fellows may not be attached to their Embassy, nor undertake any form of paid employment during the tenure of their fellowships.
- (9) The money representing a fellowship award may not be used by fellows for purposes of travel or residence outside the United Kingdom without permission of the Sino-British Fellowship Trust.
- (10) It is expected that fellows on completion of their study in the United Kingdom will return to the territory from which they came to work amongst Chinese in a field closely connected with their study in the United Kingdom so that their colleagues may benefit from their experience abroad.
- (11) The Sino-British Fellowship Trust will pay travel expenses by the most direct route, for the journey from the fellows' home town to Great Britain and return. The Sino-British Fellowship Trust will also pay subsistence at the port of embarkation and, on the return journey, at the port of arrival, whilst awaiting onward passage but the Trust is only responsible for expenses direct to the ultimate destination and any delay in port of arrival or diversion in the journey for personal reasons, will be the fellow's own responsibility.

**8. Method of Application :-** The following papers should be completed in English by the applicant. Four copies of each are required.

- (1) A Sino-British Fellowship Trust Fellowship Application Form.
- (2) A signed statement in detail of the course of study or work a candidate wishes to pursue ; his/her general interests ; details of any appointments he/she has held ; and the nature of the work he/she hopes to undertake on return to the country of origin.
- (3) A translation of the candidate's degree certificate, diploma or other evidence of education. Translations must be certified as correct by a responsible translator.
- (4) A certificate signed by one whose native language is English that the candidate's ability to read, write, speak and understand English is adequate to enable him/her to follow a course of study in that language.
- (5) The names and addresses of two persons well-acquainted with the candidate's career and character and able to give evidence of his/her ability to pursue studies abroad. Testimonials should be sent in by the referees themselves to.....  
.....  
and should not be handed to the candidate for inclusion with his/her application.
- (6) Six photographs signed and dated on the back, not larger than 14 cm. by 8 cm.
- (7) A medical certificate obtained from a doctor specified by .....together with X-Ray film of the chest. The required medical form will be sent with the application form, but applicants must pay their own medical fees.

**NOTE :** Documents sent cannot be returned.

**9. Selection of Candidates :** All applications should be received in.....  
not later than.....after which they will be carefully considered by the Selection Committee in.....

10. A recommendation made to London does not necessarily mean that a fellowship will be awarded, as the final selection is made by the London Committee of the Sino-British Fellowship Trust.

11. Candidates whose names have been recommended to London will be informed as soon as possible.

12. If unsuccessful candidates wish to apply again, they must complete new application forms.

13. Applications for Sino-British Fellowships will be received by the British Council in.....  
.....  
and should be forwarded to.....

before.....



SBFT/I

SINO-BRITISH FELLOWSHIP TRUST.

Applications for fellowships will be accepted in any of the following fields for the year 1955/56:-

MEDICAL

General Medicine  
Gynaecology & Obstetrics  
Orthopaedics  
Pediatrics  
Tuberculosis

NURSING

General  
Fever  
Mental  
Orthopaedic  
Public Health  
Tuberculosis  
Hospital Administration  
Paediatric

MIDWIFERY

SBFT/I

SINO-BRITISH FELLOWSHIP TRUST.

Applications for fellowships will be accepted only in the following fields for the year 1952/53:—

Medicine - Tuberculosis.

- Orthopaedics, including Physiotherapy.

Nursing - Specialising in Tuberculosis.

- Public Health.

- Midwifery.



# SINO-BRITISH FELLOWSHIP TRUST

## FELLOWSHIP APPLICATION FORM\*

(To be completed in handwriting)

Family Name ..... Chinese Characters .....  
(Block Capitals)

Other Names ..... Chinese Characters .....  
(Block Capitals)

Nationality ..... Sex ..... Married or Single .....

Address: (English) .....  
(Block Capitals)

(Chinese) .....

Name and address of next of kin in Chinese and English .....

Date of Birth ..... Place of Birth.....

**Education:** Schools and Colleges attended, with degrees and diplomas, if any:—

.....  
.....  
.....

Have you been abroad? If so give details .....

.....

Present occupation and date of appointment .....

.....

Present Employer .....

Previous Appointments (in order, latest first, with dates) .....

.....

.....

Preference, if any, for any particular institutions where you may desire to study:

.....  
.....  
.....

Name two persons (with addresses) in Chinese and English from whom testimonials may be obtained:

.....  
.....  
.....

**Declaration by Candidate:** I declare that I have answered the above questions fully and accurately and have read and understood the regulations as laid down by the Sino-British Fellowship Trust and I hereby promise that, in the event of my being awarded a fellowship, I will accept and abide by them.

Date ..... Signature .....

\* Applicants are required to fill in the above form in English giving Chinese characters where stated.

# Sino-British Fellowship Trust Medical Certificate.

## PHYSICAL EXAMINATION.

Name ..... Date ..... Age.....

Address .....

Height..... Weight..... Chest Measure Insp..... Exp.....

History of previous illnesses and operations .....

.....

.....

Temp. .... Pulse ..... B.P. .... mm. Hg.

General Appearance/Nutrition .....

Skin diseases .....

Eyes: Trachoma .....

Other diseases .....

Vision: Right eye ..... Left eye .....

Ears: .....

Hearing: Right ear ..... Left ear .....

Nose ..... Throat.....

Teeth ..... Lungs .....

Heart ..... Spleen .....

Anus ..... Genitalia .....

Reflexes: Knee ..... Plantar .....

Blood: Wass. R. .... Kahn Test ..... Hb. ....

R.B.C. .... W.B.C. .... Parasites .....

Urine .....

Stool (if considered necessary) .....

X-Ray Film of Chest.....

Remarks .....

.....

.....

Conclusion .....

.....

Signature of Doctor .....

Address .....

Qualifications .....



## CHAIRMAN'S REPORT.

Once more I am happy to send you my report for the year's work. Our efforts have been largely confined to the Sino-British Fellowship Trust; this has expanded considerably. During the year there have been 32 Chinese men and women students in Great Britain under our care.

Three have already completed their courses and returned home. 29 are busily engaged on the courses already arranged and negotiations are taking place with various teaching institutions regarding 10 more expected this Autumn.

The following details will give some idea of the extensive work being carried out.

Sino-British Fellowship Trust Screening Committees have been active in HONGKONG, SINGAPORE, KUALA LUMPUR, and FORMOSA. A Committee has now been formed in North Borneo. Dr. L. J. Clapham, Director of Medical Services, Jesselton, will act as Chairman of the Committee in the absence of the Ven. C. J. Alliston, Archdeacon of North Borneo, who is, at present, on furlough. Application forms will be sent at the end of this year with details of the fields in which we are able to offer scholarships.

The Screening Committees for HONGKONG, SINGAPORE and KUALA LUMPUR have been most helpful, and in all three places the personnel of the Committees has changed slightly. Membership is now as follows:-

### HONGKONG:

MR. E. A. INNES, Representative, British Council, Hongkong.  
DR. K. H. TUTTLE, Deputy Director of Medical & Health Services, Government of Hongkong.  
DR. L. G. KILBORN, Dean of the Medical Faculty and Professor of Physiology, University of Hongkong. (Previously of West China Union University.)

The applications of those in Government institutions were individually considered by Dr. K. C. Yeo, Director of Medical and Health Services. Miss M. L. Everett, Principal Matron, Medical Department examined the nursing applications.

### SINGAPORE:

MISS D. AGATE.  
MR. YAP PHENG GECK.  
PROFESSOR J. A. F. CAMERON, M.B., CH.B., D.T.M. & H., F.R.C.S., M.Ch. Orth., of the Faculty of Medicine, University of Malaya.  
MR. R. ELLIS, of the Education Department.  
REV. J. R. FLEMING, Malayan Christian Council.

### KUALA LUMPUR:

MR. W. M. EMSLIE, Acting Representative, British Council.  
DR. M. L. BYNOE, Deputy Director of Medical Services, Federation of Malaya.  
MISS E. M. HILL, Principal Matron, F.M.  
MR. A. W. D. JAMES, Acting Deputy Secretary for Chinese Affairs, Federation of Malaya.  
MR. R. W. I. BAND, Secretary to Member for Education, Federation of Malaya.  
DR. LOW NAN WAN, D.T.M.N.H., M.R.C.P. (Edin.), Medical Practitioner in private practice in Kuala Lumpur.

Mr. Goatley, British Council Representative in Sarawak, while on leave in Great Britain, called with Mr. R. C. Barkworth, Deputy Director of the Students Department, British Council, and discussed the situation with us, with regard to the possibility of School Teachers coming for a year's Fellowship Course to London University.

For the 10 provisional awards of Fellowships available for 1955-56, the following have already been put forward to the Teaching and Training institutions in this country:-

HONGKONG:

One Doctor (Obstetrics & Gynaecology.)  
One Nurse (Psychiatric Nursing).

MALAYA:

(One Doctor - Hygiene - case pending).  
One Nurse (Ophthalmic Nursing).  
Two Midwives.

SINGAPORE:

One Doctor (Bacteriology).  
Three Nurses (One Tuberculosis, One (male) Orthopaedic, One Mental).

The Doctor from Malaya, who wishes to study Hygiene, is at present being favourably considered by the British Post-Graduate Medical Federation.

There are no applications from Sarawak for this session.

FORMOSA:

We wrote to Dr. Landsborough asking him not to submit students for 1955-56 from Formosa, as we have already 5 in this country and there has been difficulty over their English. It was thought better to observe their progress before obtaining further students from Formosa.

FELLOWSHIPS AWARDED (STUDENTS AT PRESENT IN THE UNITED KINGDOM)

HONGKONG 1952-53.

DR. BENJAMIN HO and DR. HARRY S. Y. FANG.

Dr. HO passed the Primary Examination (F.R.C.S.) and at the present time he has obtained a paid appointment in a hospital in North London, meanwhile he is continuing his studies in preparation for the Final F.R.C.S. Examination this year.

DR. FANG has passed both the Primary and Final F.R.C.S. Examinations. He has now taken a paid appointment at the Broad Green General Hospital, Liverpool, pending an M.Ch. Course in Orthopaedics, which he is most anxious to take before returning to Hongkong.

The money allowance for these two Doctors ceased in December, 1954, and they will return August, 1955.



HONGKONG 1953-54

MISS ALICE CHUN was granted an extension of 1 year in order to take the Midwife Teachers' Examination. She is now at the Kingston Midwife Teachers' Training College. A favourable report has been received from the Royal College of Midwives. She is due to leave in August, 1955.

MISS SHEILA IU, passed the British Tuberculosis Association Examination in July with Honours and because of her distinction she is now at the Royal College of Nursing taking a year's course in Hospital Administration. She is due to leave in September, 1955.

SINGAPORE

MISS MARLENE KHONG on the special recommendation of the Royal College of Nursing has been awarded an extension of her Fellowship for 1 year. She is now training for the Midwives Teaching Diploma at the Bearsted Memorial Hospital, Stoke Newington, for which she is being paid by the hospital. No further grant has been paid from the fund since October, 1954. The Royal College of Nursing have submitted a very good report on this student and are anxious for her to finish the course.

SARAWAK

MISS FAITH LO's Fellowship was extended for 2 years. She is now taking a two year course in Midwifery on the advice of the Colonial Office and sponsored by the Sarawak Government who asked for her extension and are financially responsible for her extended stay. No grant has been made to her since September, 1954. She is now at St. Alfeges Hospital, Greenwich. We shall arrange for her return passage in due course.

HONGKONG 1954-55

MISS JANE YIP arrived in this country on the 8th August, 1954, to take a course in Physiotherapy. She is training at St. Mary's School of Physiotherapy and the report which has been received so far from the Principal is that she is making satisfactory progress. She is due to leave this country in August, 1956.

MRS. RITA CHENG (nee YIP) arrived in this country on the 8th August, 1954, to take a course in Physiotherapy. She is training at St. Mary's School of Physiotherapy and according to the Principal is making satisfactory progress. She is due to leave the United Kingdom in August, 1956.

DR. DENNY M. H. HUANG arrived in this country on the 28th September, 1954, to take a course in Tuberculosis at the Welsh National School of Medicine, Cardiff. He is making excellent progress and the Hon. Director of Medical and Health Services, Hongkong, has asked him to attend the Fourth Health & Tuberculosis Conference of the National Association for the Prevention of Tuberculosis to be held in June this year, as one of the delegates from Hongkong. Dr. Huang has asked that his Fellowship may be extended for another year in order that he can take a Course for the M.R.C.P. in Edinburgh, and also take the Membership Examination. He is due to leave the United Kingdom in October, 1955, and his case is under consideration



HONGKONG 1954-55.

DR. DENNY M. H. HUANG cont.

by Professor Heaf of the Welsh National School of Medicine, and on his advice we shall be asked to act regarding the extension.

DR. GANG TONG LEE, arrived in this country on the 26th September, 1954, to take a course in Tuberculosis at the Welsh National School of Medicine. He visited the Pasteur Institute, Paris, for the 10 days in Paris and on his return to this country went to the Llangwyfen Hospital, Denbigh, N. Wales. He is making good progress and is due to leave the United Kingdom in October, 1955.

MISS CHUNG LAU arrived in this country on the 31st August, 1954, to take a 2 year's course in General Education at Whitelands College, Putney. She is making good progress and is due to leave in September, 1956. Her training is undertaken in conjunction with the Church Missionary Society.

FORMOSA

DR. BUN TSU SI arrived in England on the 28th June, 1954, to take a course in Pediatrics. At first she had great difficulty with her English but now seems to be making good progress. She is at the West Middlesex Hospital, and attends the Peltham Clinic in Teddington four times a week.

DR. YANG K'UN TS'AI arrived in this country on the 31st August, 1954, to take a course in Orthopaedics at the London Hospital. He is progressing satisfactorily.

DR. MING HUI HWANG arrived in this country on the 31st August, 1954, to take a course in General Medicine. He was at the Edinburgh Post-Graduate Board of Medicine for a while and is now training at the Post-Graduate Medical School of London. He is making good progress.

MISS A. CHAO CHEN arrived in the United Kingdom on the 31st August, 1954, to take a course in Midwifery at St. Stephens Hospital, S.W.10. She has asked for her Fellowship to be extended for another year so that she can study Hospital Administration. She is making good progress and her English is improving. Negotiations are now in hand with the Royal College of Midwives concerning her extension, which will probably be granted on their advice.

All these students are due to return to Formosa on the S.S. "CARTHAGE" sailing from Southampton on the 16th September, 1955.

DR. YENG SUNG CHEN arrived in this country on the 31st August, 1954, to take a course in Tuberculosis at the Welsh National School of Medicine, Cardiff. He visited the Pasteur Institute in Paris for a short course and is now at the Abergele Sanatorium in Denbighshire. He has asked that his Fellowship be extended for another year in order that he may try for a place in the T.D.D. Course next year. The Honorary Secretary has



FORMOSA 1954-55

DR. YENG SUNG CHEN cont.

agreed this programme with Professor Heaf, who called to discuss his case. He will take a three weeks intensive course in English arranged by the Ministry of Health.

MALAYA.

DR. KUO AN HUANG arrived in this country on the 26th September, 1954, to take a course in Orthopaedics. He is now at the Royal National Orthopaedics Hospital, W.I. He is making good progress and passed an examination on Pathology in November. He is due to leave this country in September 1955.

MRS. PUI CHEONG CHEE, arrived in this country on the 24th August, 1954, to take a course in Public Health Nursing arranged by the Birmingham Public Health Department. She is making good progress and is due to leave England in September, 1955.

MISS JUN SAM CHOOI arrived in the United Kingdom on the 24th August, 1954, to take a course in Public Health Nursing arranged by the Birmingham Public Health Department. She is due to leave in September, 1955.

MISS MONICA CHOW arrived in this country on the 24th August, 1954, to take a course in Midwifery at the Fairfield General Hospital, Bury. She has had difficulty in settling down, but I think she is now more settled. She is due to leave England in September, 1955.

MRS. JOAN TAN SIEW YOONG came to England on the 24th August, 1954, to take a course in Midwifery Parts I and II at the Bristol Maternity Hospital. She is making good progress and is due to take the Part II Midwifery Examination in March. She is due to leave in September, 1955.

MISS AGNES LIP arrived in the United Kingdom on the 24th August, 1954, to take a course in Midwifery. She is making satisfactory progress and after she has completed six months at the Glenroyd Hospital, Blackpool, she will be going to the Kingston Teachers' Training College for Part II Midwifery Examination. She is due to leave in September, 1955.

MR. LOCI FOOK CHEE, arrived in this country to take a course in Mental Nursing at Springfield Hospital, Tooting. His progress is most satisfactory and he leaves England in September, 1956. He is the first male nurse to come from the Far East to this country for training.

SINGAPORE

MRS. ONG ING CHEN arrived in England on the 17th August, 1954, to take a course in Public Health Nursing at the Royal College of Nursing. Her progress is steady and she is due to leave in August 1955.



SINGAPORE 1954-55

MISS AGATHA KWEE SIN CHUA came to this country on the 17th August, 1954, to study Public Health Nursing at the Royal College of Nursing. The Royal College of Nursing report that she is progressing quite satisfactorily. She is due to leave in August, 1955.

MRS. LOUISE YEN KIAW WONG arrived in the United Kingdom on the 18th August, 1954, to take a course in Fever Nursing at the Fazakerley Hospital, Liverpool. She is, however, anxious to take a course on Hospital Administration at the Royal College of Nursing and has already taken the entrance examination for the course. She is due to leave in August, 1956.

MISS CHENG KIOK LIM arrived in this country on the 18th August, 1954, to take a course in Pediatrics at the Victoria Hospital for Children, Chelsea. Her Fellowship award was originally for 2 years; however, on the 27th October, 1954, she changed over to Orthopaedic nursing so that her Fellowship was reduced to 1 year. She is making satisfactory progress at the Rowley Bristow Hospital, Pyrford, Nr. Woking and is now due to leave in August, 1955 instead of 1956.

MISS SOO YONG LEE arrived in this country on the 18th August, 1954, to take a course in Orthopaedics at the Rowley Bristow Hospital, Pyrford, Nr. Woking. Her progress is most satisfactory and she is due to leave in August, 1955.

MR. OON ENG KHOO arrived here on the 28th September, 1954, to study Religious Education for a period of two years. He is making good progress at Richmond College Divinity School and is due to leave in October, 1956.

Mr. Khoo took the place (at Mr. Fleming's suggestion) of Mrs. Ah-Suen CHONG from Singapore, who was unable to accept the Fellowship awarded to her in 1953-54 owing to domestic reasons.

STUDENTS WHO HAVE RETURNED TO THEIR HOMES DURING 1954-55.

MALAYA 1953-54

MRS. BEATRICE VAN GEYZEL - Public Health Nursing - was awarded an extension of 3 months in order that she could sit for the Royal Sanitary Institute Certificate in November, 1954. She passed this and left England for Malaya on the 10th December, 1954. We have received a good report, copy attached, from the Royal College of Nursing on her and now await her personal report.

MISS CHOY SIM CHANG - Midwifery - left England on the 9th October, 1954, and is now back in the General Hospital, Penang. She passed the Part II Midwifery Examination in June, 1954. The Royal College of Midwives have submitted a report, copy attached, which speaks highly of Miss Chang. She herself has submitted a personal report, also a copy attached.



STUDENTS WHO HAVE RETURNED TO THEIR HOMES DURING 1954-55.

FORMOSA 1953-54. DR. YU CHI YANG left this country on the 13th August, 1954, and returned to Formosa via the United States. Copies of two reports received from the Institute of Diseases of the Chest and the Birmingham Chest Clinic are submitted herewith. (Pending his personal report.)

COMMITTEES:

MANCHESTER Committee have adopted Miss Sheila IU, Dr. M. H. HUANG and Dr. Gang Tong LEE, all taking Tuberculosis Courses and the cost of their Fellowships are being met from the Manchester Fund.

SHEFFIELD. The Final Notice of the definite closing down of the Sheffield Committee has been received. All money held by the Committee has now been received.

SUBSCRIBERS:

The list of Covenanted Subscribers remains at 6. Fourteen firms have sent donations during the year and a small number of individual donations have been received.

FINANCE:

(A) Payments of Students expenses and other out of pockets continued to be made from the Company's resources until July 31st, 1954. For this reason an Income and Expenditure Accounts has been compiled. All such outlay was made on behalf of the Sino-British Fellowship Trust and, as will be seen, has been charged to the Trust. From 1st August, 1954, onwards, all payments have been made by the Trust.

(B) Income from Donations, Investments, etc., amounted to £371.10s.6d. and this amount after deduction of £127.18.11d., the measure of income from Manchester Tuberculosis Fund investments, has been credited to the Sino-British Fellowship Trust.

(C) Steps are now in operation to transfer Investments and Cash totalling £6,221.5s.2d. to the Sino-British Fellowship Trust, so extinguishing the amount standing to the credit of the Trust at 31st December, 1954.

(D) The Manchester Tuberculosis Fund has been charged with £1,500 being £500 each for three students sponsored by Manchester and enjoying Sino-British Fellowship scholarships in the year 1954. This charge reduced the responsibility of the Company to Manchester to £4,590.4s.10d. and as a result the 2% Conversion Loan holding now exceeds this liability by £829.14s.2d.

We are indebted to the indefatigable work of the Honorary Secretary, who this year has said farewell to 3 visitors, is supervising the work of 29 now here and dealing with the 10 new students expected in the Autumn.

Those who have had experience in arranging for one

visitor to this country regarding arrival, clothing, language, suitable courses, lodgings, holidays and finance, will appreciate the volume of hard work and imaginative sympathy required in dealing with so many folk visiting this country for the first time.

Once more I would call attention to the immense value of personal acquaintance with our visitors, who include several most gifted and attractive young people. A good Chinese friend is a remarkable enrichment and a friend for life. This I can testify from my own experience.

(Signed) Stanley H. Dixon.

10th February, 1955.

CHAIRMAN.



Room 160,

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CS:EH

31st May 1955

Dear Sir John,

Thank you for your letter of  
May 26.

All right; we will lunch together  
on Thursday, June 2. Let's get in  
at 12.45 before everything is eaten  
up. I have booked a table so that  
we can have a talk.

Looking forward to seeing you,

Yours sincerely,

CHARLES SINGER

Sir John Hutchison, K.B.E.  
Bullaceton  
Saltwood  
Hythe, Kent.

THE 6336.

BULLACETON,  
SALTWOOD,  
HYTHE, KENT.

26 May 1955.

Dear Professor Singer,

Like you, I have  
great admiration for Needham  
- and also a personal  
liking - and I would gladly  
help if possible. The U.C.C.,  
however, has I believe  
not much unallocated  
money at the moment,  
and the Council (of  
which I am not a  
member though I attend



meetings or F.O. representative)  
could not I feel sure  
be able in any circumstances  
to consider so large a  
grant as you seem to  
have in mind.

However, I am going to  
a meeting of the Council on  
the morning of the 2<sup>nd</sup> June  
and will raise the matter  
of a further £100 grant to  
Needham then, though I

am not optimistic that they  
will feel able to give it favourable  
consideration.

I shall be lunching at  
the Athenaeum afterwards  
and if you should happen  
to be there we could, as  
you suggest, lunch together  
and talk - if not, I will  
write to tell you the Council's  
reaction.

Yours Sincerely  
V. P. Kenyon.



Room 160,

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CS:EH

24th May 1955

My dear Arthur,

Many thanks for your letter of May 22.

Of course you are right, and I quite agree with you that £600 is about right for Wang Ling. It isn't quite as simple as that. He would have to be moved from Cambridge to London and some sort of allowance would have to be made for it. Joseph Needham was, moreover, hoping for some incidental expenses in the way of transcribing, clerical work etc. I think, however, that £600 would in fact do the trick, though £1,000 would oil the wheels much better and would give a quicker and more efficient result. Perhaps I was wrong in not mentioning these extra Wang Ling matters in the first instance. Meanwhile I am going forward with the matter as well as I can.

As I dare say you know, the whole thing is tied up with complications in connection with the Chair of the History and Philosophy of Science at London University.

Kind regards,

Yours sincerely,

CHARLES SINGER

Arthur D. Waley Esq., C.B.E., F.B.A.  
50 Gordon Square  
London, W. C. 1

May 22

50 Gordon Square  
W.C.1

Dear Charlie

I am so sorry I left you all that time without an answer. The point that seems to me to present some difficulty is Wang Ling's salary. I had a feeling that most people would regard £1000 as excessive. I began to make enquiries about what would be regarded as comparable cases, & the general opinion seems to be that something like £600 would be usual, if the post is a whole-time one (which from talk with Wang I should not suppose it is). The view that £1000 is excessive is therefore likely to be taken by any person or body approached with a view to raising funds. I am quite aware that Wang would be almost impossible to replace, & that if he has been receiving something like £1000, he cannot now be asked to accept less. I will gladly repeat, what I have already said in print, that I think Needham's book is of the greatest importance, if any kind of testimonial is asked for.

Yours sincerely  
Arthur Waley



BRATTON HOUSE,  
WESTBURY, WILTSHIRE.  
BRATTON 231.

May 22nd, 1955.

Dear Mr. Singer:-

On receiving your letter of May 20th I got my wife, who is a member of the (rather nebulous) committee of the United Aid to China Fund, to write to Mrs. Moore, who manages it, about Wang Ling. She gave Mrs. Moore your address and telephone number, so you may perhaps hear from her direct.

I am sorry, but I know nothing about the Universities China Committee. Would there not be someone at the School of Oriental Languages in London who would be in contact with them and also interested in Needham's work?

All this is not very helpful, I feel. And it is rather with a feeling of false pretences that I accept, with much pleasure, your invitation to lunch at the Athenaeum on July 9th.

Yours sincerely,

*Eric Sayer*

Room 160,

6666-----

CS:EH

20th May 1955

My dear Arthur,

May I beg you to give me some sort of answer to my letter of May 3 concerning Joseph Needham ?

I may say that since I wrote to you I have had helpful letters from Sir George Sanson and Sir Horace Seymour. I feel that I must know where you stand in the matter before I can go further forward.

It is obviously a very difficult position for you, as for me. The thing that I care about, however, is Needham's project itself, which seems to me simply magnificent and to be encouraged at all costs. Of course, others may take a different view.

Kind regards,

Yours very sincerely,

CHARLES SINGER

Arthur D. Waley Esq., C.B.E., F.B.A.  
50 Gordon Square  
London, W. C.



Room 160,

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CS:EH

20th May 1955

Dear Sir Horace,

Many thanks for your prompt reply to my letter concerning Needham. I can answer some of your questions right away.

At the present moment, Needham assures me, he is paying Wang Ling out of his own pocket.

Wang Ling may surely be regarded as a student. He is, in fact, a candidate for the Ph.D. this year at Cambridge, which will no doubt be awarded to him. He is registered as a student and thus comes certainly under any fund which helps Chinese students in this country.

I quite realise the awkwardness of endeavouring to obtain anti-communist funds for communist propaganda. Had I been a member of a committee disposing of such funds I think I should have looked twice at the matter but, having done so, I think I should go on and say that this is a proper learned project and should be aided. Maybe those who constitute these committees are not as easily persuaded as you and I !

As regards this absurd germ warfare business. I, like Needham, am a trained biologist. I can only assure you again that what he has said on germ warfare doesn't make biological sense. I therefore accept it as one of the aberrations of a very distinguished mind. I cannot explain Joseph Needham's attitude on it and I fear that it is one of those things that just remains inexplicable. To give a parallel, I have recently heard

that Sir Charles Parsons, the inventor of the turbine and perhaps the greatest scientific engineer of modern times, had such an abiding terror of the number 13 that he falsified the date of his birthday - which happened to be on the 13th - and that the false date has gone into the Annals of the Royal Society, of which he was one of the most distinguished members. I am quite sure that your experience agrees with mine that human beings are odd creatures.

As regards the Universities' China Committee, the Provost of University College, London, - where I was once a Professor - assures me that this body has funds of which they don't dispose as readily as they might. The funds are there and he is under the impression that pressure might be brought to bear on them. I don't know who the members of that committee are. Have you access to any information on the subject? They are not mentioned in Whitsker.

Arthur Waley is, of course, a very good bet but he is not the most businesslike man that I know. I have difficulty in extracting an answer from him but I will try again. I regard this project of Needham's as so important and so basic to our whole culture that I am reluctant to relinquish any effort that I can possibly make to forward it.

I am so glad to hear that you will be in Town. Let's lunch together at the Athenaeum on Thursday, 9th June, at 12.45. I have already booked a table. Try and be in time because Thursday is the busy day at the Athenaeum and we shouldn't get anything to eat if we started late!

Yours sincerely,

CHARLES SINGER

Sir Horace Seymour, G.C.M.G. C.V.O.  
Bratton House  
Westbury, Wilts.



*Confidential.*

BRATTON HOUSE,  
WESTBURY, WILTSHIRE.  
BRATTON 231.

May 18th, 1955.

Dear Mr. Singer:-

I was much distressed to see, from your letter of yesterday, that Joe Needham is in trouble over his Mr. Wang Ling. I realise that J.N. has, in the germ warfare affair, let his irresponsibility (quite highly developed in some ways) run away with him. It is, incidentally, odd, but I suppose quite natural, that these accusations against the Americans had such a much wider press coverage than the exactly similar ones which the then Chinese Government made against the Japanese.

But that is all by the way. I do not know how Wang's expenses have been financed hitherto. Two years ago, I should think, I acted as a reference for some organisation which was finding some money, but it was done by filling up some kind of form and I did not, I see, keep the correspondence. I assume from your letter that whatever was arranged then has come to an end. But I do not of course know what sources it is hoped to tap to fill the gap.

So far as support for the project is concerned, I assume that the China Society, which Waley could mobilise, could be counted upon, but, like all these societies, they have no spare cash. You mention the Universities China Committee: I don't know what they are doing now, but I think they generally prefer to do nothing. The British Council, being always under fire in the press, would probably think J.N. too hot to touch. The British United Aid to China Fund still has money, some of which is supposed to be for the benefit of students. Could Mr. Wang be considered a student - perhaps we all are? This I could find out from the Fund for you, if you think it a possibility. But I think that Sansom and Waley are your best bet: they can speak with authority at any rate on the Eastern side of the question, tho' not on the scientific, and I can only reflect the feeling of the general reader that this is, to judge from Vol. 1, a prodigious work.

*\*Not in his  
book, of  
course.*

I am sorry not to be more helpful, and sincerely hope the present difficulty will be surmounted, but Joe, to whom I am much attached is, to put it plainly, trying to combine Communist propaganda with anti-communist finance. But I hope it will work.

*Yours sincerely  
H. R. Seymour* *NS*

P.S. I shall be I expect in London on  
June 8-9 & should be delighted to call  
on the 8<sup>th</sup> or lunch on the 9<sup>th</sup>, if  
the affair is not settled by then. Many  
thanks for the suggestion.



MERTON HALL

CAMBRIDGE

TELEPHONE 4488

18th May, 1955.

Dear Professor Singer,

Lord Rothschild is away at a Marine Station off the coast of Scotland at present, and I therefore write to acknowledge your letter to him of yesterday's date. It is being forwarded on to him to-day.

Yours sincerely,

M. E. Brewster.

Secretary.

Professor C. Singer, D. Litt., M.D.,  
D.Sc., F.R.C.P.,

Room 160,

-----  
CS:EH

17th May 1955

Dear Sir Horace,

I have the utmost admiration for the work of Joseph Needham, which seems to me to be quite the most important enterprise in the humane studies now before the English-speaking public. I can think of nothing that would be more significant than the comparison of western civilisation with its only possible parallel. I would do anything in my power to advance it.

There are, as you doubtless know, various obstacles in Needham's path, not least of which is his own unfortunate commitment on this absurd germ warfare business. That is no concern of mine, though it is, in fact, most unfortunate that so eminent a biologist in his own right should have written what seems to me mere biological nonsense. What is my concern is to do what little I can to see that the magnificent literary project, which is now well advanced, is properly continued and completed.

The chief and immediate difficulty seems to me to provide for his Chinese assistant, Wang Ling. This means roughly \$1,000 a year for five years. I cannot believe that the Universities' China Committee (if that is its correct name), which has money in hand, cannot be persuaded on this point.

Joseph Needham and his wife have been spending a week with me in Cornwall. They are both interested in this History of Technology. I, on my side, have undertaken to do what I can for Wang Ling. I would very much



like to have your opinion on the matter and advice as to the best procedure. The names that Needham suggested for first attack were Sir George Sanson, Otto van der Sprenkel and Arthur Waley. I have written to the first, who has agreed to do what he can; I am writing to the second; and Waley happens to be a fairly near connection of my own. I need hardly say that I would prefer very much for someone else to undertake it than for me, who am quite unknown, at any rate in such circles.

If you are in London, perhaps we could confer on these matters. Would you lunch with me at the Athenaeum or would you prefer to call one morning at my office here, where we could sit and talk ?

Yours sincerely,

CHARLES SINGER

sent to :

The Rt. Honourable Lord Rothschild, F.R.S.  
Merton Hall, Cambridge.

Sir Horace Seymour, G.C.M.G., C.V.O.  
Bratton House, Westbury, Wilts.

Professor H. H. Dubs  
133A Banbury Road, Oxford

Sir John Hutchison, K.B.E.  
Bullaceton, Saltwood,  
Hythe, Kent.

~~Sir Horace Seymour, G.C.M.G., C.V.O.  
Bratton House  
Westbury, Wilts.~~

Room 160,

-----  
CS:EH

17th May 1955

Dear Mr. van der Sprenkel,

I have the utmost admiration for the work of Joseph Needham, which seems to me to be quite the most important enterprise in the humane studies now before the English-speaking public. I can think of nothing that would be more significant than the comparison of western civilisation with its only possible parallel. I would do anything in my power to advance it.

There are, as you doubtless know, various obstacles in Needham's path, not least of which is his own unfortunate commitment on this absurd germ warfare business. That is no concern of mine, though it is, in fact, most unfortunate that so eminent a biologist in his own right should have written what seems to me mere biological nonsense. What is my concern is to do what little I can to see that the magnificent literary project, which is now well advanced, is properly continued and completed.

The chief and immediate difficulty seems to me to provide for his Chinese assistant, Wang Ling. This means roughly \$1,000 a year for five years. I cannot believe that the Universities China Committee (if that is its correct name), which has money in hand, cannot be persuaded on this point.

Joseph Needham and his wife have been spending a week with me in Cornwall. They are both interested in this History of Technology. I, on my side, have undertaken to do what I can for Wang Ling. I would very much



like your advice and opinion on the matter. What I want to know is whom to approach and how to approach them. The names that Needham suggests for first attack are Sir George Sanson and Arthur Waley. I have written to the first, who has agreed to do what he can, and Waley happens to be a fairly near connection of my own. Before going further I would like to have your opinion on the matter and advice as to the best procedure. I need hardly say that I would prefer very much for someone else to undertake it than for me, who am quite unknown, at any rate in such circles.

Could we perhaps discuss these matters? Would you lunch with me one day at the Athenaeum or would you prefer to call one morning at my office here, where we could sit and talk?

Yours sincerely,

CHARLES SINGER

O. P. N. B. van der Sprenkel Esq.  
School of Oriental and African Studies  
The University of London  
Gower Street  
London, W.C.1

May 15, 1955

Chandos Lodge,  
Eye,  
Suffolk.

Dear Dr. Surin,

I agree with you about the importance of Needham's work, and should like to give him my help that is in my power. I did a year or two ago support his appeal to the Universities China Committee, for help to continue employing Wang Ling, but without success.

I know very little about the "Politics" of these matters, but it is certain that Needham antagonized some people or institutions of his own warfare statement. This remains an obstacle, but I think it can be surmounted if we can mobilize enough important people in the field of Chinese studies (and Asian studies in general) to signify the completion



Charles Lodge

Essex

1892

of his project is a matter of first-class importance. Waley and van der Sprenkel are, of course, good names; but I should think the list ought to include as many Scandinavians as possible (not only English) and also scientists and historians like Gausef.

The position ought to be more favourable now than in Vol. I is not and has been very well received here and abroad.

\* I will let you know in advance

It would be a pleasure to have a talk with you when I am next in London. That, I fear, will not be until early June.\*

As I spend so little time in England, I cannot undertake any continuous, consecutive work on Neesham's behalf, but I am ready to lend a hand.

Yours sincerely  
George Sanson

→ Arthur Waley

→ Otto von der Spenckel  
Laidan School of Oriental

→ Sir George ~~Fan~~ Sansom.



Room 160,

-----  
CS:EH

12th May 1955

Dear Sir George,

I have the utmost admiration for the work of Joseph Needham, which seems to me to be quite the most important enterprise in the humane studies now before the English-speaking public. I can think of nothing that would be more significant than the comparison of Western civilisation with its only possible parallel; I would do anything in my power to advance it.

There are, as you doubtless know, various obstacles in Needham's path, not least of which is his own unfortunate commitment on this absurd germ warfare business. That is no concern of mine. What is my concern is to see that the project is properly continued.

The chief and immediate difficulty seems to me to provide for Wang Ling. This means roughly £1,000 a year for five years. I cannot believe that the Anglo-Chinese Academic Committee (if that be its correct name), which has money in hand, cannot be persuaded on this point.

Joseph Needham and his wife have been spending a week with me in Cornwall. They are both interested in this History of Technology. I, on my side, have undertaken to do what I can for Wang Ling. I would very much like your advice and opinion on the matter. What I want to know is whom to approach and how to approach them. The names that Needham suggests for first attack are Otto von der Spenchel and Arthur Waley, but before going further I would like to confer with you. I need hardly say that I would prefer very much for someone else to undertake it than for me, who am quite unknown, at any rate in such circles.

Could we perhaps discuss these matters ? Would you lunch with me one day at the Athenseum or would you prefer to call one morning at my office here, where we have a quiet room where we could sit and talk ?

Yours sincerely,

CHARLES SINGER

Sir George Sansom, G.B.E., K.C.M.G.  
Chandos Lodge  
Eye, Suffolk.



Room 160,

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CS:EH

3rd May 1955

My dear Arthur,

I have the utmost admiration for the work of Joseph Needham, which seems to me to be quite the most important enterprise in the humane studies ~~that is now before us~~. I cannot think of ~~anything~~ <sup>anything</sup> that would be more significant than the comparison of Western civilisation with its only possible parallel. I would do anything in my power to advance it.

*English speaking public*

There are, as you doubtless know, various obstacles in Needham's path, not least of which is his own unfortunate commitment on this absurd germ warfare business. That is ~~neither your concern nor mine~~ <sup>his</sup>. What is ~~our~~ <sup>my</sup> concern is to see that the project is properly continued.

The chief and immediate difficulty seems to me to provide for Wang Ling. This means roughly £1,000 a year for five years. I cannot believe that the Anglo-Chinese Academic Committee (if that be its correct name), which has ~~plenty of~~ money in hand, cannot be persuaded on this point.

Joseph Needham and his wife have been spending a week with ~~us~~ <sup>me</sup> in Cornwall. They are both interested in this History of Technology. I, on my side, have undertaken to do what I can for Wang Ling. I would very much like your advice and opinion on the matter. What I want to know is whom to approach and how to approach them. The names that ~~Joseph~~ <sup>Needham</sup> suggests for first attack are Otto von der Sprengel and ~~Sir George Sanson~~ <sup>Arthur Waley</sup>, but before ~~doing~~ <sup>going</sup> anything I would like to confer with you. I need hardly

*further*

*going*

say that I would prefer very much for someone else to undertake it, ~~notably yourself~~, than for me, who am quite unknown, at any rate in such circles.

*Could perhaps*  
When could we discuss these matters? Would you lunch with me one day at the Athenaeum or would you prefer to call one morning at my office here, where we have a quiet room where we could sit and talk?

~~With kind regards,~~

Yours ~~very~~ sincerely,

CHARLES SINGER

Arthur D. Waley Esq., C.B.E., F.B.A.  
50 Gordon Square  
London, W.C.



27th. April, 1955

tel. 3275

My Dear Charles ~~Singer~~ <sup>Sorry!</sup>:

Thanks very much indeed for setting the ball rolling about the Nuffield Foundation support by trying to enlist the cooperation of Ifor Evans at University College, and for sending me a copy of your letter to him. I sincerely hope that this proposal will continue to go forward.

You ought further to be aware of the following development. When I was in Durham lately I spent some time with the Reader in Chinese there, R.S. Dawson, who was most surprised to hear of my financial difficulties concerning Wang Ling, and subsequently spoke about it to the new Professor of Chinese here, Edward Pulleyblank, who also had not realised the situation. Both of them are members of the Universities' China Committee. Pulleyblank therefore telephoned me to say that he was sure that the Cambridge Faculty of Oriental Studies could be persuaded to put forward a proposal to the General Board in such terms that an official appeal for funds would go to the UCC from the University. This was a very welcome "vote of confidence", but, as all of us know, the UCC is at present in the hands of certain people so "right-wing" that any application on my behalf might be refused even if it were to have the full backing of Cambridge University. Today I talked the matter over further with Pulleyblank, and pointed out that although I was very grateful for his help, I did not want to interfere in any way with the important *démarche* which you yourself are making, and it was therefore agreed between us that my sinological colleagues here should hold their hand for the time being. At the same time, he said that he would be extremely willing to be asked to join in the group of signatures which you are collecting, and though himself still young, occupies nevertheless a strategic position in his chair which would surely add much weight to the group. I therefore send you his address, which is 24 St. Andrews Road, Chesterton, Cambridge.

Andrews /

Lastly, would you please tell Dorothea that although I called on Taton at Paris, he was unfortunately out of town. Thus I could only leave a note for him, and was unable to discuss with him personally the responsibility which we should all like him to undertake.

Ever yours,

Joseph

Phoned 2.5.55 &amp; 3.5.55



UNIVERSITY COLLEGE LONDON  
GOWER STREET WCI

From THE PROVOST  
B. IFOR EVANS, M.A., D.LIT.

Telephone  
EUSTON ~~4000~~ 7050

ghb

19th April, 1955

Dear Singer,

I was very interested to have your letter of 14th April and to know that Needham and Mrs. Needham had been staying with you.

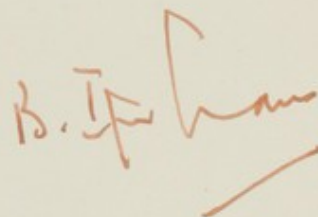
I do know of the difficulty that Needham is having to find financial support for his Chinese coadjutor, Wong Ling. I note with interest that you are going to approach the appropriate Trusts.

I am sure you will realise that I have a deep appreciation of the scale and importance of the work Needham is doing, and I hope that you will be successful in your application. I take it that this is all that you are suggesting in your letter when you say that you wish to "assure yourself that you would have me with you".

I am very interested to know that you are coming to the Fellows' Dinner and that you will be in London for some time after that. I should much appreciate a call from you, and look forward to a visit. Perhaps you would be kind enough to let me know in advance when you are likely to come so that I can set aside the necessary time to explore all the matters in which we are both interested.

Yours sincerely,

Professor Charles Singer,  
Kilmarth,  
PAR, Cornwall.





15th April 1955

My dear Joseph,

Many thanks for your two letters.

The first thing to do, I feel, is to get the Provost of University College on our side. I therefore have written to him a letter of which I enclose a copy. I shall be in London the week after next and will make a point of calling on him as soon as possible. Once having got his adhesion I shall follow the lines that we discussed.

It was really lovely having you both here. It gave us a great deal of pleasure, as well as teaching us both a great deal.

With love to you both from us both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
12 Rue Degas  
Paris XVIe





UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

ORGANISATION DES NATIONS UNIES POUR L'ÉDUCATION, LA SCIENCE ET LA CULTURE

Téléphone : KLÉber 52.00 - Télégr. UNESCO PARIS  
19, AVENUE KLÉBER - PARIS XVI\*

In your reply, please refer to :  
En répondant, veuillez rappeler :

N°

Wed. 13th. April, 1955

12, Rue Degas, Paris, XVIe

as from : Caius College  
Cambridge

My Dear Charles:

This letter is supplementary to my letter of the 8th. concerning the financial support which I need for my collaborator and research assistant Wang Ling.

You will remember that I mentioned Toynbee's listing of "Science and Civilisation in China" vol. 1, as one of the best books of 1954 in one of the Sunday papers (I think the Observer) around Christmas time. Dophi has now remembered that the name of the other interviewee who also mentioned the book as one of those which had most interested him, on the same occasion, was A. J. Ayer. He is, as you know, one of the most distinguished of the younger generation of philosophers, and is Professor of Philosophy at University College. He also visited China recently. Although we are not yet personally acquainted, it is obvious that he would support your plan if asked.

On re-reading my letter, I see that I said nothing about the length of time for which a subvention is needed. Clearly one or two years only would not suffice for the completion of the project, and I had intended to say that I would like to seek support for at least five years. Perhaps a 7-year period would be too much to ask for, but that would set all my anxieties at rest.

I wonder whether you have seen the review of vol. 1 in Nature, just out, of which Dophi sent me a cutting? Evidently the editors were quite nonplussed to find a reviewer, and must have just telephoned the School of Oriental Studies, so that it got into the hands of Eve Edwards, one of the sinologists there. Although the review is quite favourable, she failed to seize on any of the really important points, and produced a couple of columns filled with a bric-a-brac of trivialities. Addressed to the scientific world, this is, we feel, most unfortunate. If you know Brimble, I wonder whether you could find an opportunity of ensuring that at least the subsequent volumes are entrusted to someone with more sense of responsibility? Neither the Press nor I could do anything about this directly.

Ever yours affectionately,

*Joseph*



UNIVERSITY COLLEGE LONDON

TELEPHONE EUSTON ~~4400~~ 7050

B. IFOR EVANS, M.A., D.LIT.

ghb PROVOST

GOWER STREET W.C.1

15th April, 1955

Dear Professor Singer,

In the Provost's absence I have opened your confidential letter to him of the 14th April. May I send you this note to say that I will show the Provost your letter immediately he returns to College next week?

Yours sincerely,

*B. M. Baker*  
Provost's Secretary.

Professor Charles Singer,  
Kilmarth,  
Par, Cornwall.

14th April 1955

My dear Provost,

I was in London four weeks ago and met McKie who told me that Needham was being considered for the post at U.C. On my return I found a letter from Needham to the same effect. Needham and his wife were with us here last week - a visit arranged many months ago.

Needham had not occurred to me for U.C. because, when I was last on the selection committee, he refused it. Had I known the situation I should have urged McKie not to apply much more strongly than, in fact, I did. I shall be in London for the Fellows dinner and for two or three months after and I would like to call on you.

Quite without regard to the U.C. issue I would like to say that Needham's Chinese project is, in my judgement and within my knowledge, the most important undertaking in the realm of the humanities for many years. Its basic difficulty is to find support for his Chinese coadjutor, Wong Ling. About £1,000 a year for five years is needed for that, and incidental expenses.

I propose, therefore, that I, or a younger and more influential man, if he can be found, draw up an appeal to one or two of the grant-giving trusts - Muffield, Wellcome, Pilgrim etc. - signed by a few influential names. The main object of this letter is to assure myself that I should have you with me.



- 2 -

I should add that at present Needham supports  
Wong Ling out of his own pocket.

With kind regards,

Yours sincerely,

CHARLES SINGER

(B. Ifor Evans)  
The Provost  
University College London  
Gower Street  
London, W. C. 1



UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION  
ORGANISATION DES NATIONS UNIES POUR L'ÉDUCATION, LA SCIENCE ET LA CULTURE

Téléphone : KLEber 52 00 - Télégr. UNESCO PARIS  
BALzac 24 02  
19, AVENUE KLÉBER - PARIS XVI<sup>e</sup>

In your reply, please refer to :  
En répondant, veuillez rappeler :

N<sup>o</sup>

*Confidential*

as from : Caius College, Cambridge

12, Rue Degas, Paris, XVI<sup>e</sup>

8th. April, 1955

My Dear Charles :

I arrived here safely last night, and although Dophi will I know be writing independently to you and Dorothea to thank you both so warmly for the delightful time we had during the past week, I cannot forbear from doing so myself also. There is nowhere on earth like Kilmarth, a unique place of beauty and charm created by two absolutely unique people. As I inscribed in the register-book "To the Singer Family - 10,000 years !"

As you had been so kind as to suggest that what needed doing to solve my Wang Ling problem was to organise an approach to the Nuffield Foundation signed by a group of distinguished people, I have lost no time in giving you what assistance I can by providing a list of people whom I know or believe to be enthusiastic supporters of "Science and Civilisation in China". The essential point is to find some financial provision for my collaborator and research assistant, Wang Ling (Wang Ching-Ning). He is now about 36, and before leaving China had been assistant professor of history at Fudan University (normally in Shanghai, but during the war evacuated to a place near Chungking). He was subsequently a research associate of the Historical Institute of the National Academy (Academia Sinica), and is nominally still on leave of absence from this. Since his coming to England in 1946 he has been supported by a number of grants, first a British Council travelling fellowship, then by a special grant from Mr and Mrs Spalding of Oxford, then for a year by the Universities' China Committee, and lastly two years from the Leverhulme Foundation. Since then, and at various times, his maintenance has had to come from the private funds of Dophi and myself. All this time it has never been possible to pay him more than £ 450 a year (though sometimes this has been exceeded because I have paid his fees as a candidate for the Ph.D. degree). I feel quite convinced, however, that for a man of his value and qualifications, a trained Chinese historian, it is high time that a better salary should be found for him. Now, therefore, that the book is beginning to receive a considerable measure of public recognition, I think I ought to try to get for him something more like £ 600 a year, and as



his student status will soon end (his thesis must be submitted this summer or never) I foresee he will begin to be subject to British income-tax - therefore I should like to ask for £ 700. If this figure were fixed upon, I have wondered whether it would not be possible to ask for a round figure of £ 1000, to help me in carrying the burden of the purchase of books, microfilms, photostats, photographing etc - which all adds up as you well know, to monstrous figures. But this is a matter which I should prefer to leave to your judgment to decide, for you certainly have more extensive experience of these foundations than I have.

In placing before you for your choice the following names, I have divided them into several groups according to the aspects from which they approach my work.

A) Foreign Office; international relations with China:

- 1) Sir Horace Seymour (Luccombe House, Bratton, Westbury, Wilts) KCMG etc, was ambassador in Chungking all through my time (1942-1946), always enormously helpful to my work, and very friendly. Only a few weeks ago I had a letter from him congratulating us on vol. 1.
- 2) Sir George Sansom (Chandos Lodge, Eye, Suffolk), primarily a japanologist but the man originally responsible for the suggestion that there should be the scientific and cultural mission to China, the greater part of which I eventually carried out. It was he who gave the excellent discussion of vol. 1 on the BBC Third Programme recently.
- 3) Sir John Hutchinson (Bullaceton, Saltwood, Hythe, Kent), was Commercial Counsellor and then Chargé d'Affaires in my time. Has always been a supporter (also a Caius man).
- 4) Sir John Pratt (1, Wetherby Gardens, SW 5), never in China with me but admires the book. The least useful of these names, however, because in recent times very active politically against the prevailing current, (for the present purpose, that is to say).

B) General Academic:

- 5) I don't know whether you noticed it, and in spite of a slight criticism of him in vol. 1, Arnold Toynbee listed the book among the best books of the year in the Observer around Christmas-time. Another selector also did the same thing at that time, but for the moment I have forgotten who it was - however, I will get hold of the name and let you know. If Toynbee did this off his own bat, I'd suppose he'd be willing enough to add his signature to your letter.
- 6) Lord Chorley (The Rookery, Stanmore, Middlesex) has been very agreeable; I meet him in Caius, where he comes periodically to teach law. I'm sure he is a well-wisher to the project of the book, and would help if asked.
- 7) Canon C.E. Raven, DD (10, Madingley Road, Cambridge) would, I think, also add support, if you liked to include a churchman. He has been rather patronising about the book in the past, but now always asks after its progress most warmly.
- 8) Prof. E.R. Dodds (Regius of Greek, Christchurch, Oxford), was my colleague on the cultural mission for a short while in China, 1942, and I believe wishes the book well. He helped by reading my chapter on natural law.
- 9) If it were desirable to have someone closely connected with my own College at Cambridge, one of the kindest and keenest is Dr F.P. Bowden, FRS, an influential physical chemist. I am sure he would be delighted to be asked for support.



## C) Sinological:

- 10) One would naturally have to ask Arthur Waley (50, Gordon Square, WC 1). I am pretty sure that he was strongly against my being invited to the chair of Chinese at Cambridge, and in general he tends to be rather anti-scientific, but after vol. 1 appeared he made amends to some extent by doing a very laudatory review in History Today. In the course of this he said that the project deserved every possible encouragement, so quite probably he would be willing to sign up.
- 11) At Oxford the professor of Chinese is the American H. H. Dubs (133A, Banbury Road), whom at one time or another I have felt rather ambivalent (though he was very kind when long ago I gave the Beard Lectures at Oxford). Last year, at the International Orientalist Congress, however, he congratulated me unexpectedly warmly on vol. 1, so I think he would respond favourably.
- 12) Other sinologists who are really keen are also rather younger, notably Otto van der Sprenkel and Professor Phillips at the London School of Oriental Studies. Probably you have been thinking rather of elderly and very well known people.

## D) Natural Sciences : This I find a very difficult department, for all the most eminent people at the Royal Society seem to me hopelessly lacking in appreciation for history of science, especially if it is non-post-Renaissance and non-European. However, I have the following to suggest :

- 13) Julian Huxley FRS of course. I am sure he would like to sign, but of course is very often out of England.
- 14) A man on the spot is Lord Rothschild FRS (Merton Hall, Cambridge). As chairman of the Agricultural Research Council he is eminent, as well as doing good research himself; though not, I think, particularly interested either in history of science or in China, is personally well disposed to my project.
- 15) D. Keilin FRS, emeritus Quick Professor and head of the Molteno Institute (where letters reach him) is rather of the same sort, having known Dophi and me very well from the start, and always benevolent and helpful, so would sign.
- 16) Sir Harold Jeffreys FRS the geophysicist (160, Huntingdon Road, Cambridge) has served with me on all the Cambridge committees about the history of science in Pt. I of the Natural Sciences Tripos, etc., and though so reserved, does, I believe, admire the work we are doing.
- 17) Max Newman, FRS, professor of mathematics at Manchester University (home address, Cross Farm, Comberton, Cambridgeshire) has long been very friendly to my work.
- 18) N. W. Pirie, FRS at the Biochemical Dept., Rothamsted Agricultural Experiment Station, Harpenden, Herts, is, as you know, deeply interested in the philosophy of science, and has himself visited China. Though rather younger than myself, his distinction is widely recognised, and I have no doubt that if you thought he was not too young, he would willingly give his support.

## E) 19) In the field of Engineering there is Prof. A. W. Skempton of Imperial College, whom you know well as he is contributing to your book. Due to his interest in hydraulic engineering he read my chapters on this and has been greatly impressed by them, I am glad to say. He would certainly support.

- 20) Rex Wailes (Davidge Cottage, Knotty Green, Beaconsfield, Bucks), though as the windmill king of somewhat restricted scope, is nevertheless now President of the Newcomen Society. He is a very old friend for we were both at Oundle at the same time, and my invitation to give the Dickinson Lecture doubtless has something to do with him. He'll sign.



- F) 21) In the field of Medicine (though I realise that it might be rather important with the Nuffield) I have no one to suggest except Prof. Benjamin Platt, one of the leading nutritional science experts of the Medical Research Council (Ebor Cottage, the Ridgeway, Mill Hill, NW 7). In his youth he worked for a number of years at the Lester (Medical) Institute, Shanghai, and for long retained a keen interest in all Chinese things, but more recently has been concerned mainly with Africa. I think (though I'm not quite sure) that he would welcome being asked to give his support to your proposal. There must be many medical men who have either had Chinese experience, or who have been interested in vol.1 of the book, but unfortunately I do not know who they are.
- G) History of Science as such:  
You will no doubt be able to think of others, but two reliable ones I'm sure would be :
- 22) J.R. Partington (29, Mill Road, Cambridge) and  
23) Walter Pagel (65, Wriothesley Road, NW 10) - if well enough known - one of our best friends.
- H) Those who know of my international work in general, e.g. building up the Department of Natural Sciences in UNESCO :
- 24) Lord Samuel followed the work of my mission in China, and the subsequent UNESCO work with the same kind of appreciation shown by Cripps and Winant. I used to lunch with him when back in England. But I don't know whether he has looked into vol.1.
- 25) Lt. Gen. Sir Adrian Carton de Wiart, VC (Aghinagh House, Killinardrish, Co. Cork, Eire) is a legendary soldier who was Churchill's personal representative with Chiang Kai-Shek during the war years, and whom therefore strangely we got to know in Chungking. Though peppery according to tradition, he was extremely nice to Dophi and me. Though I don't know whether he has looked into vol.1, his support would be well worth trying for.
- 26) Lord Stansgate - formerly Wedgwood Benn - (40, Millbank, SW 1), knows of my work for friendship between China and this country since the war. But again I don't know whether he has seen vol.1.
- I) The Arts and Literature. The following names may seem rather unlikely, but I think it is worth telling you of them in case you should think it a good idea to have a group very broad in its representativeness, and not only scholarly or of social eminence.
- 27) John Grierson, the famous film producer (Beaconsfield Film Studios, Bucks) was a colleague of mine in UNESCO, and has followed my work in subsequent years, as I found to my surprise when I met him accidentally last year. I have no doubt he would give support if it were asked.
- 28) The poet and writer Rex Warner (Next to the "Bear", Woodstock)  
29) The painter Stanley Spencer and  
30) The actor-dramatist W. Miles Malleson (60, Wigmore Street, W 1) have all visited China recently, and I am personally known to all three. They would certainly join in.
- 31) The same applied to Prof. William Empson, the well known literary critic, who until very recently was occupying a chair in Peking.

This is about all the information which I can provide. It will surely have been tedious reading, but my aim has been to save you trouble.

The heading of this notepaper suggests to me, lastly, that you might wonder why I have never been able to get any financial aid from UNESCO. Of course I have never applied for any, for no one knows better than I do how strictly it is earmarked for assistance to forms of organised international cooperation as such, for short-term rather than long-term projects, and for pilot-operations such as those concerned with the liquidation of illiteracy, fundamental education, and the like. The small amount which UNESCO had to spare for anything of the kind which I am trying to do, went long ago on their own project for the Cultural and Scientific History of Mankind.

So let me apologise once again for depositing this long memorandum with you, and thank you beforehand most sincerely for anything which you may be able to do towards a collective effort on my behalf with the Nuffield or possibly some other Foundation.

With affectionate salutations to Dorothea,

Ever yours,

Joseph



UNIVERSITIES' CHINA COMMITTEE IN LONDON

(Incorporated by Royal Charter).

BCM/UNGHICOM  
LONDON, W.C.1

-16, GORDON SQUARE,-

LONDON,--

W.C.1.

Telegrams & Cables :  
Unchicom, Westcent, London.

Telephone :  
Euston 3736

4th July 1956.

Professor Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

Dear Sir,

I return herewith Volumell of Dr. Needham's  
Science and Civilisation in China which you kindly  
sent with your letter No. CS.EH dated 15th February.  
together with the excerpts from Reviews.

At their Annual General Meeting this Committee  
approved the grant of £400 towards this project.

Yours truly,

*A. G. Hooker*  
Secretary.

FAMDOU 1956  
UNIVERSITIES' CHINA COMMITTEE

25th July 1956

My dear Joseph,

First of all, we have just received the bound copy of Science and Civilization in China, Volume II. What a magnificent thing it is. Thank you very much indeed. I have no doubt that Dorothea will be writing to you soon.

Secondly, I have got a little bit at cross purposes in writing to you about a previous volume, which is in fact the proof copy of this Volume II. I thought it came from you because I had not read the enclosed letter properly, but it was a return of the proof copy that I sent to the China Committee; it contained a letter addressed to me saying that they had voted you £400 on the strength of it. I had a vague idea that the whole thing was addressed to you and that you had re-addressed it to me. This was, of course, wrong, and was simply a mistake on my part. I therefore return to you this proof copy.

I hope you will go on doing this wonderful work until it is completed. It will always have our deepest admiration.

With affectionate regards to you both from us both,

Yours as always,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



1 Owlstone Road, Cambridge

18th July 1956

tel. 2183

My Dear Charles:

Thanks for your letter of the 13th. <sup>(and Dorothea's of the 14th.)</sup> I am delighted to hear that you both like the look of Vol. 2. But I'm distressed to hear about the rheumatism which must be due to this dreadful summer. Actually I didn't send you the letter from the UCC but had daily been meaning to write to tell you about it and thank you once again for all the trouble you took. What they have done is of course a great help.

Ever yours affectionately and Dorothea's

Joseph

Room 160,

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CS:EH

13th July 1956

My dear Joseph,

How lovely to have your second volume in print. It came just as I went out this-morning and I haven't had a chance to look at it yet, but I send you our heartiest and most warm congratulations.

£400 is, after all, better than being kicked down-stairs. I am not sure you meant to send me the letter from the China Committee and I will return it to you as soon as I have shown it to Dorothea. I take it that you can do the same thing with Volume III and get another few hundred pounds out of them. Anyway, it is worth trying.

Let us know when you will come to see us. We leave for Kilmarth on Saturday, 21st July.

Love to you both from us both, and again heartiest congratulations,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



Room 160,

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CS:EH

10th May 1956

My dear Joseph,

I cannot tell you how sorry I am to have missed your Newcomen Lecture last night. I left the College of Surgeons at 5.30, thinking to get a taxi. It started raining and it was a quarter of an hour before I could get one. The rush hour was by then fully on and I should have been at least 20 minutes late. I therefore drove home instead. It was a great disappointment to me. Of course, I very much wanted to see you.

I have a letter from Wu Lien Teh today, saying that he too had missed you because he has been in Cambridge while you were away, but I think that he will be there when you get back.

Love to you both from us both,

Yours ever,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge

T. I. Williams

---

CS:EH

30th April 1956

My dear Joseph,

We have had some long talks with Wu Lien Teh and are greatly attracted to him. We discussed a good deal the prospects of his work and I am writing to you on that subject only.

Wu Lien Teh, like most of us, has his limitations and his qualities. Horses don't run on rocks and bulldogs are no good for racing. Wu Lien Teh is a good doctor with a good English education and good literary tastes; he is a brave man and has had unique experiences. He could write a very interesting book indeed. What he cannot do and what he hasn't got is any philosophic grasp of his own status or that of his people. It is just no good expecting out of a man something that he cannot give because he hasn't got it. He could write a good personal narrative and, of course, his experience of the plague is unique. We must try to keep him to those things and not to get him to give a picture of the relations of East and West. He is not the man for that.

Dorothea is very willing to get his book into order. It is the sort of thing she could do well and it would be a relief to have her occupied on something of that kind, which doesn't involve too much argument and especially not too much doctrine. I think this is just the thing for her and I think you could safely encourage Wu Lien Teh to leave it to her. Wu Lien Teh wants to be headed off anything in the nature of philosophy or religion or relations of East and West, or anything of that kind.

continued . . . .



- 2 -

He just hasn't that kind of brain, though he has a very good brain. I feel sure that if you spent a day with him you would agree with me.

We come to Town tomorrow. The London office will find me.

With love to you both from us both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge

21st April 1956

My dear Joseph,

It is most generous of you to let me have The Herbal in Antiquity. I will return it as soon as the book is out and I will certainly accompany it with a copy of the book. Heaven knows when that will be.

I have been looking through Wu Lien Teh's material and I have come to the conclusion that one might over-improve it. The simplicity of the narrative might easily be injured by sophisticated editing. Nevertheless, I think that it needs drastic cuts and I think too that it would be better as two books rather than as one. However, I shall be seeing him tomorrow and will form my impressions then.

It is extremely good of you to let me have back the odd numbers of Isis. The Belfast people are trying to make a complete set and that is not an easy thing to do.

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge.



My Dear Charles:

1) I was delighted to learn that the interleaved copy of "Greek Med. & Biol. in relation to Modern Med. & Biol." has given you pleasure and will be useful. Naturally I was extremely sorry to part with it, but in the meantime the following suggestion would meet the case. Could you, I wonder, be so good as to ask the press to send me a copy of both vols. of "Studs. in the Hist. & Meth. of Science" at author's rate? Then I would write you a cheque as soon as I knew the amount. I really don't like to be without your monograph, even though it will be a couple of years yet before I can get to the biological-medical volumes of my own book.

2) I do have a copy of your "Herbal in Antiquity",<sup>\*</sup> and am enclosing it herewith, though my pleasure at being able to respond to your request is matched only by my agony at seeing it leave my shelves. Here again, may I beg of you to be sure to have the publishers of the new edition of this wonderful monograph send me a copy at author's rate, for which again I will send a cheque whenever I know the amount.

How soon will it be before the reprinted separate issue appears? I seem to remember your showing me some coloured drawings of plants when I was at Kilmarth recently - perhaps they were destined for this.

3) Your letter of yesterday arrived just in time this morning for me to be able to entrust the package of Isis odd numbers to Wu Lien-Tê, and he has promised to bring them with him. Please do accept my thanks for the long loan I have had of them. Unfortunately it nearly always seems to happen with incomplete runs that the reference one wants is in an issue one hasn't got.

4) Wu Lien-Tê has been endearing himself quite a lot with people here. Our ulterior plans concerning him will depend on the reactions of some people (including a couple of members of the Council of the Senate) whom I have invited to meet him at dinner tomorrow evening. I believe there is a good chance of success.

5) Confidentially, it looks as if Heffer's will print his book (aided by a subvention), and I have agreed to do the necessary blue-pencilling editing (not the complete reorganisation which would have been necessary for non-assisted publication). I feel it an honour that he has sufficient confidence in me.

With love to Dorothea,  
Ever yours,

Joseph

\* Of course I could not think of letting you buy it from me!

18th April 1956

My dear Joseph,

I forgot to say in my last letter could you let me have back those odd numbers of Isis ? The University of Belfast is taking all my spare numbers of Isis.

Wu Lien Teh is coming here on Sunday next and he would, I am sure, bring them with him and so save you the trouble and expense of packing them.

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge.



13th April 1956

My dear Joseph,

Very many thanks for your letter of the 10th April. How good of you to return that interleaved copy, which is really useful.

The thing I am most short of is a copy of my Herbal in Antiquity, which, as you know, is to be reproduced in a new edition with coloured plates. Have you by any chance a copy of that and, if so, would you let me buy it from you? I only had a very few reprints and they fetch as much as £10 or so in the open market. One cannot even buy a run of the journal containing it, so that I am reduced to one single copy, which is getting rather worn.

By some carelessness and owing to having too much to do in connection with A History of Technology, I have neglected communicating with Wu Lien Teh until his arrival in England and now I don't know his whereabouts. He will be calling - and I think staying - at Emanuel. Could you find out and get him to communicate with me? We very much want to see him and if he would get us on the phone we would arrange for him to come down here, if he will. We ourselves go to London on or about the 1st May. I sent you a copy of the letter which I had intended to send to him but it cannot reach him until I am in communication with him. If you see him, you might show your copy to him.

It was lovely having you both here.

Yours affectionately,

CHARLES SINGER

29th February 1956

My dear Joseph,

I have a letter today from Wu Lien Teh saying that he will arrive in London on the 10th April, that he will be there till the 13th April, and will then spend a week in Cambridge. I thought you would like to have these dates as soon as possible.

His address is 12 Brewster Road, Ipoh, Malaya.

Yours ever,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



CS:EH

28th February 1956

My dear Wang Ling,

I have just heard that you have been awarded the Ph.D., and I write you a line of congratulation. I hope and feel sure that this will lead to many important contributions from you.

Mrs. Singer asks me to join her congratulations to mine.

With kind regards and every good wish,

Yours sincerely,

CHARLES SINGER

Dr. Wang Ling  
c/o. Dr. Joseph Needham  
1 Owlstone Road  
Cambridge

T. I. Williams

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CS:EH

28th February 1956

My dear Joseph,

Many thanks for your letter of the 26th February. I am so glad that the Wellcome Trust are coughing up a substantial sum; it will do them good as well as you! You must feel very happy about it.

Did I write to you that Wu Lien Teh will be in England from April 10th for some weeks at least? He is a gallant fellow and I suggested to Dale that he ought to be given an honorary degree at Cambridge, but Dale didn't seem to think him distinguished enough. I cannot agree. I think a possible hope is that I might do something at Oxford, but of course Cambridge is the right place. The only thing against Cambridge is that Oxford and Cambridge don't usually give honorary degrees to their own graduates, I believe.

While writing of Wu Lien Teh, I have a confession to make. You will remember that he changed his name from Gno Lien Tuck. At that time he sent me his History of Chinese Medicine under his new name, which I had never heard before. I could not acknowledge it because I didn't know whose it was and it seemed rather out of my line. It was a very large book and after it had been lying about for some time I got rid of it. Now, of course, it is unobtainable, and I am sorry. But I just did not know at the time that the two names belonged to the same man. I have never confessed this, of course, to Wu Lien Teh himself.

continued . . . . .



How awfully decent of the Blue Funnel Line. It really is a nice gesture. It happens that I have a great great nephew who is an officer in their service and is as happy with them as he can possibly be. He has been several times for a day or two at a time in China.

If the China Committee comes off, I imagine that your affairs are settled.

I have written a line of congratulation to Wang Ling, addressing it care of you.

So far as I know, the Oxford Press isn't affected by the present dispute but, of course, it is by the national economy. The price of our volume I has been raised by a guinea and it now costs 8 guineas instead of 7. Incidentally, they raised it without any reference to me. I don't know whether they asked I.C.I. because the Director in charge of it is at present abroad. I learnt of the rise in price from one of their advertisements. I don't think, however, that either you or I need bother about our volumes being out of reach of the ordinary purchaser because they were that already. It really doesn't matter whether you charge 6 guineas or 10 guineas for a many-volumed book. The private buyer is out of the market and I am quite sure that no-one who uses television is going to substitute either your book or ours for that amenity.

I am so glad things are going all right.

With love from us both to you both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



My Dear Charles:

Several pieces of very good news have come lately, and I hasten to make you and Dorothea participators therein.

First, I heard from Dale yesterday morning that the Wellcome Trust has taken a favourable decision about "Science & Civilisation in China". They have granted 900 per annum for three years to pay the salary of Lu Gwei-Djen to collaborate with me here on the chemical-biological-medical (7th. and 8th.) volumes, starting at the beginning of 1957. In addition, they offer 500 to bring over for a few months in the summer of 1958 or 1959 Hou Pao-Chang (professor of pathology at Hongkong) to collaborate with and advise us on the clinical-medical side of Chinese medical history.

I hope you will accept my warmest and most affectionate thanks for all that you did in paving the way for this most successful outcome to my application. It is hard to find words to express my gratitude.

Secondly, as the result of a quite different application, I heard only a couple of days before from the Blue Funnel Line that they would be pleased to grant 1000 towards the work, payable over a four-year period. This will be a great help towards Wang Ling's salary. Of course, if the Universities China Committee also help, the load would be completely lifted from my mind for some time to come. The Blue Funnel Line, as you may know, is one of the most important trading between Britain and China. Founded by the Holt family, it used to give free passages for medical and other Fellows, and Gwei-Djen herself had one when she first came west in 1937.

Thirdly, the oral examination of Wang Ling passed off successfully, so that when he has emended his thesis for deposition in the University Library, he will become a Cambridge Ph.D. We are all delighted that this has gone through satisfactorily.

I wonder whether your publishers are undergoing anxiety about the financial situation. Kingsford here at the Press has been very worried about the national economic position, and of course the printing trade dispute, which a short while ago threatened to mean complete closing of the Press.. He says that rising prices are such that unless we can get a further subvention, our Vol.3 might have to be priced as high as £ 9, which would put it right out of reach of the private buyer. So I shall appeal again to the Bollingen Foundation. Presumably ICI will keep "History of Technology" afloat in this sense. What worries!

Love from both to both;

Joseph

NEEDHAM

(F)



UNIVERSITIES' CHINA COMMITTEE IN LONDON

(Incorporated by Royal Charter)

Telegrams & Cables: *Unchicom, Westcent, London.*

Telephone: *Euston 3736.*

16, GORDON SQUARE,

LONDON, W.C.1.

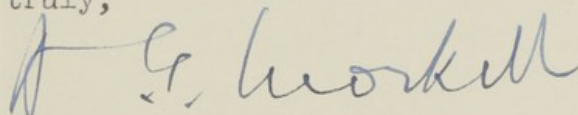
16th February, 1956.

Prof. Charles Singer,  
A History of Technology,  
Kilmarth,  
Par,  
CORNWALL.

Dear Sir,

I thank you for your letter CS/EH of the 15th  
February and for the proof copy of Vol. 2 of "Science  
and Civilisation in China", of which I will take due  
care.

Yours truly,



Secretary.

1 Owlstone Road, Cambridge

16/2/56

tel. 2183

● Many thanks for letter - No need to send the short memo on to Dale; he has already had it. I've met Lloyd at the Horological; he is just as you say. Hope far weather is nice and warm - not like Cambridge snow and ice! Every  
Joseph





Dr. Charles Singer  
Kilmarth  
Par  
Cornwall

T. I. Williams

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CS:EH

15th February 1956

My dear Joseph,

Many thanks for your letter of the 10th February. The parcel from Cambridge arrived yesterday. I have sent it off to the China Committee today with a note of which I enclose a copy. You will observe that the meeting is not until the 31st March. Nevertheless, I think that it is wise to get it into their hands as soon as possible as several of the members of the Committee may wish to see it.

Thanks for the draft for the Wellcome Foundation. I am not sure whether you would like me to forward it or whether you are doing it yourself. I think, however, that if you wish me to do so I had better delay a little because a few days ago I wrote to Dale enclosing a letter from Wu Lien Teh; this letter said that he would be in London this summer. I suggested to Dale that we ought to try to get an honorary degree from either Oxford or Cambridge for Wu and that also he might be of assistance to you in your medical chapter. For these reasons I think I had better wait until I hear from Dale, who, of course, may be abroad.

I am very glad to have your script on Chinese Astronomical Clockwork. I have hanging over me an awful chapter on clocks by a man who knows all about them but nothing at all about how to describe them. The result is that I have to go through his article sentence by sentence and insist upon his making me understand it - no mean task. However, this Alan Lloyd really does know what he is talking about and will, I am sure, be particularly interested in your lecture. Of course, it would be better to have it in a reprint from Nature.

continued . . . . .



- 2 -

We are hoping to get out Volume II of our work by May but your Volume II will obviously be out before ours.

We are much looking forward to the day when you do come down here, and meanwhile affectionate greetings from both to both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham F.R.S.  
1 Owlstone Road  
Cambridge

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CS:RH

15th February 1956

Dear Sir,

Reverting to your letter to me of the 14th  
November 1955.

I have just received from the Clarendon Press  
an advance proof copy of Volume II of Dr. Needham's  
Science & Civilization in China. It is fairly com-  
plete but the cross-references have not been inserted.  
I send it to you now as it seems possible to me that  
some of your Committee would care to know of the pro-  
gress of this work before the meeting on the 31st  
March. I understand that two more volumes are in  
an advanced stage of preparation.

I think it would be difficult or impossible to  
obtain a second proof copy so that this would, for  
the moment, have to be passed from hand to hand by  
those who would wish to understand how the work is  
proceeding.

Yours faithfully,

CHARLES SINGER

The Secretary  
Universities' China  
Committee in London  
16 Gordon Square  
London, W.C.1



Dr. Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

My dear Charles,

I expect you will remember that on the 16th November last, you sent me as an enclosure a letter from the Universities' China Committee in which they said that they would reconsider the question of a grant to me for my work on "Science and Civilisation in China" when the previous financial year came to an end. That means in this month, or the coming one.

I feel that it might be desirable for the members of their Council to have some idea of the extent of detail in which subjects are treated in the main volumes of the work; that is to say, the volumes which follow the first, or introductory volume. I have therefore asked the Cambridge University Press to provide us with a bound Proof copy of Volume 2. As I am not in direct touch with the Universities' China Committee about this, I am asking the University Press to send the copy to you, and I should be very grateful if you could forward it on to the Universities' China Committee in London.

The Clockwork lecture in London went off very well, and I shall be giving it again here next week. In the meantime, I am sending you a mimeographed private circulation note which we have sent to Nature, and hope will be published there.

We were glad to get a letter from Dorothea the other day, and I might take this opportunity of saying that the conical straw hat which she spoke of does not belong to us! We are, of course, as usual looking forward very much indeed to our next visit to Kilmarth; but we cannot quite see when it will be. Perhaps some time in the Spring. Meanwhile, with best wishes as usual to both of you from both of us.

Ever yours affectionately,

Joseph

MEMORANDUM ON THE VALUE OF THE STUDY OF THE HISTORY  
OF SCIENCE AND TECHNOLOGY IN CHINESE CIVILISATION

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- 1) It is now widely agreed that the study of the history of the pure and applied sciences in general is of great value. We have in it the only means of seeing the scientific activities of our own time in true perspective, and a most useful contribution to the humanisation of scientific and technological education. It is a quite indispensable part of the history of human civilisation as a whole.
- 2) It is now becoming apparent that the history of science and technology in the Old World must be treated as a unity. No longer is it possible to think of the work of Hellenistic Greece or of the Middle Ages as completely isolated from developments in India and China. Hence the urgent need for historians of science who are able to use the tools available to orientalists, and to collaborate with Asian scholars.
- 3) It is also becoming clear that the Chinese, in the centuries before the Renaissance, contributed far more to man's knowledge of Nature, and to his control of his environment, than has hitherto been realised.  
For example, the accepted view concerning the extremely important invention of clock-work has long been that it originated in Europe at the beginning of the 14th. century A.D. But no recognisable antecedents of these mechanical clocks were identifiable. Recent research has shown, however, that there existed in China a great tradition of astronomical clock-making from the beginning of the 8th. century onwards, and that the designs employed were directly ancestral to the European inventions.  
*in East Asia* The history of medicine has been studied less carefully than the history of engineering, but many contributions such as variolation, certain discoveries in materia medica, early sphygmology, and remedial gymnastics, are well known.
- 4) The problem of how it was that at the time of the Renaissance modern science in Europe so rapidly outstripped the sciences of Asia, naturally presents itself. But there is the companion problem of why Chinese science and technology, during the first fourteen centuries of the Christian era, were so much more advanced than those of Europe. It is clear that the course of events in Chinese civilisation offers challenging parallels with that which occurred in the West.
- 5) Lastly, this new knowledge, and these problems, are by no means academic only. In a world of constantly narrowing dimensions, the mutual approach of neighbouring but very different civilisations must essentially be based upon sympathetic appreciation of each other's achievements and modes of life. Work in this field, therefore, is assuredly an important contribution to international understanding.



T. I. Williams

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CS:EH

13th December 1955

My dear Joseph,

Many thanks for your long letter of the 26th November, which I should have answered earlier.

I believe if you were to suggest to the Wellcome Foundation that Wu Lien-Teh be invited to come to England to work with you for the summer, they would undertake to pay his expenses. He is universally respected and it happens that he is well known to Dale. I don't think he ought to be asked to stay except in summer for his own sake; he is an old man now and having been born in Malaya and lived there all his life, I don't think he ought to consider being in England in winter. If all goes well he might perhaps come again in '57. So far, I don't believe there would be any difficulty.

As regards Dr. Lu Gwei-Djen, why not ask straight away for a subsidy for her to come to England for, say, six months in the first instance? What about suggesting that she should come about the time that Wu Lien-Teh leaves, say next September?

I believe if you couch such a request to the Wellcome Foundation and stress that it is for the purpose of completing your work on the History of Chinese Medicine and Biology, the matter would be considered in a friendly light. I don't think it would bother the Wellcome Trustees that the book itself was not to be published for some years. If they were satisfied that the work was going on satisfactorily, I think that they would be happy enough to make a grant.

continued . . . .

- 2 -

Drop me a line to let me know what you think of these suggestions so that I may act accordingly if and when I see Dale.

Any chance of Dophi and you coming here ? You know you are always welcome.

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



My Dear Charles:

Thanks very much for yours of the 23rd. on two subjects. I am afraid you have slightly misunderstood my excessively brief paragraph about clockwork. I did not say that extensive gearing was 'native Far Eastern'. Of course I know Derek Price's work on the Anti-Kythera Orrery and his reconstructions. No one could deny to the Alexandrians considerable knowledge of gearing, though I think Price himself has some reservations about it (which I don't quite understand).

But it is also the case that the first water-mill in China comes in the early +1st. century, just before the now-accepted date of Heron. We have, too, moulds for gears from this period in Chinese museums. I would assuredly not like to maintain that Alexandrian mechanical knowledge had no influences as far away as China, but on the other hand there is no positive evidence for it, and the developments seem almost parallel in time. It seems that the question remains open (cf. our Vol. 1, pp. 231, 232).

What I was trying to tell you about is something rather different. The 3rd. chapter of Su Sung's Hsin I Hsiang Fa Yao (+1086) gives a very elaborate description (including specifications for all component parts) of an astronomical clock which was constructed at that time in the imperial palace. In translating this (for the first time of course) we've gathered in more than 120 technical engineering terms of the Chinese +11th. century. Now from the detail given in abundance it is quite clear that we have to deal with a clock involving both trains of gears and an escapement. The former operated a considerable amount of jackwork, and turned besides a celestial globe and an armillary sphere. The latter (i.e. the escapement) retarded systematically the rotation of a great driving-wheel moved by water-power, and comprised a kind of weighbridge for the scoops, together with a system of linked rods and stops which has a distinct similarity in pattern with the anchor escapement invented so much later in Europe. At first we thought that this escapement differed from the later verge-and-foliot types of the European +14th. century, and a fortiori from the anchor escapements, in not itself regulating the time-keeping. This, we thought, depended only on the rate of flow of water into the scoops. But actually it is clear that the escapement contributed to time-regulation because its counterpoise could be delicately adjusted to control the amount of water required in each scoop before it could trip the lever and fall. Furthermore, believe it or not, there is an arrangement to prevent recoil of the driving-wheel at each tick.

Su Sung also gives a historical account, which we've translated, from which it is perfectly clear that his basic



system was not new, but an improvement of principles which had been understood and practised as early as the +8th. century (Thang period), though many of the individual devices were his own contribution. Thus it would appear that the Chinese perfected, in the early middle ages, the application of water-power (in the strict sense) to the slowed rotation required for time-keeping. One +10th. century type used mercury instead of water so that the clock would be unaffected by freezing temperatures.

As I then went on to say, one interesting feature of the situation is that these Chinese clocks seem to be more nearly related to the +14th. century European clocks than do the Byzantine and Arab striking water-clocks of the intermediate period. For the latter (as we can see by the large monograph of Wiedemann) depended only on the sinking of a float in an outflow clepsydra, carrying with it cords which performed various effects without need of either gearing or any escapement. In other words, the earlier Chinese clocks, like the later European ones, depended basically upon a slowed wheel. Nearly a year ago, C.B. Drover published in Antiquarian Horology a picture of a water-clock with bells, and involving a wheel, from a Bodleian MS of about +1280. He accompanied this with a discussion of the evidence for striking water-clocks in European monasteries from the early +12th. century onwards. Generally there is no evidence that they had wheels - they may have been of the Byzantine-Arab type. But it might well be that clocks of the Chinese water-wheel type were known in Europe in those centuries, in which case we might have to think of a transmission westwards about +1100, which is ~~more~~ more difficult to imagine than a similar transmission about +1280 (the Mongol period), though the crusades might ~~well~~ have been instrumental. Yet the paradox is that the Arab type of striking clepsydra was much less closely related to the European +14th. century clocks with falling weights and slowed wheels than the Chinese earlier type with slowed water-wheel.

We have obviously reached here the boundary where secure knowledge begins to peter out. But one thing is clear - I shall have to eat my words about clockwork being an undeniable European contribution ! (cf. Vol. 1, p. 243). I now propose to say very little about Su Sung's 'orrery' clock in the astronomical chapter in Vol. 3, and to reserve a detailed description of it in Vol. 4 (mechanical engineering). But in the meantime we (that is, Price, Wang, and I) will publish the full translation and illustrations in some journal. I suppose there's no chance of your coming to the meeting on Jan. 11th.? It would be so great a pleasure to have you there to honour our communication !



I now follow your example, and descend from what the +4th. century Chinese called chhing than (pure or supra-mundane conversation) to organisational affairs. I want to thank you greatly for raising again the question of the Wellcome Foundation grant, and the desirability of proceeding further with regard to it while Dale is still active and apparently favourably inclined.

The situation is that I myself shall not be able to begin any work on the medical volume (Vol.8) for some years to come. You know how difficult it is for me that I have to continue all normal lecturing duties as Reader in Biochemistry while at the same time trying to press forward with the book. Even if the hypothetical chair of the History of Science materialised, and even if it was offered to me, which is still more hypothetical, my time would not be greatly saved, since administrative duties would be added to lecturing - though of course the mental strain of so wide a coverage would be greatly relieved. Although the C.U. Press cannot put through more than one of our 600-pp. volumes each year, the proof-correcting involved is so time-consuming that it leaves me little more than a quarter of the year for cutting new ice. Consequently we are still stuck in the middle of Vol.6, and I see no immediate hope of more rapid progress. Indeed I feel deep anxiety that now, while still in full possession of my powers, I cannot get on with the creative work required to finish the entire task, but instead must spend literally month after month over the proofs. By 'creative work' I mean not only the actual writing, but what is even more vital, the organisation of the many discrete elements in dossiers, notes, and books, into the coherent, clear and rounded-out account necessary for each topic. The attitude of the Press, however, is that if I were to disappear before the publication of all that has already been written, it would perhaps never be published at all, for they would find it hard to entrust anyone else with the job of seeing it through press. One obviously cannot run the risk of piling up a vast mass of unpublished material. Apart from any other consideration, publishing conditions might change for the worse. The only way of escape from the dilemma that I can see is to hire (if I had any funds with which to do so) some person who could read proofs really well looking for misprints, misplaced footnotes, etc., so that I need only go through them once in each case. The press has readers, of course, but (between ourselves) they are quite insufficient.

What then must the general forecast be regarding dates? Vol.2 (History of Thought) should appear early next year, and I hope (though I have small confidence in it) that Vol.3 (Mathematics, Astronomy and the earth sciences) may appear before the end of 1956. If so, that would mean Vol.4 (Physics and Mechanical Engineering) in 1957, and



Vol.5 (Civil,Hydraulic and Maritime Engineering) in 1958. There would then have to follow a gap if Vol.6 (Techniques of Peace and War ; military technologies,textiles,paper and printing) is not ready. I don't think the chemical and biological volumes (including Medicine) could be finished before 1963,even if additional helpers come,as I have some reason to think,or hope,that they may. The date at which I could envisage beginning to write the volume containing the medical sciences and arts would thus be 1961 approximately. The conclusion of the whole work cannot be expected,therefore,much before 1967,which is the year when I reach the retiring age. These are rather unpleasant facts,but they have to be faced.

Of course,by the time I reach the age of 67,I shall probably take courage and inspiration from your example, and look forward to another ten years of satisfactory activity,but where I am now feels like the lower valleys of a Mount Everest which has yet to be climbed. I seem to be only approaching the snow-line.

Among the additional helpers to whom I have just referred,the most important by far is our old friend Dr Lu Gwei-Djen,who will soon have completed nearly a decade of work in the UNESCO secretariat in Paris,and thus will qualify for a fairly substantial pension. Since she was one of the three friends to whom is owing my original decision to begin work towards the present book,we all feel that it would be truly in the natural pattern of things that she should come and spend some years in collaborating towards the Chemical and Biological-Medical volumes,which are just the fields in which her own specialities and extensive training lie. We do not yet know when she will be leaving UNESCO,but it might be at the beginning of the coming year (1956),perhaps more probably the beginning of 1957 or 1958. Since she would at once start work upon these particular volumes,it would mean that active preparation for them would be going forward,though I myself would not be directly occupied with them. Since that portion of the whole project would be definitely advancing,the situation would surely qualify for the reception of the Wellcome grant.

As is understandable,I should particularly like to use much of the grant by way of two or three years' salary for Dr Lu. This would not need to be at a very high level because she would be concurrently enjoying her UN pension, but some payment from British funds would be in the highest degree desirable,even if only to regularise matters with the immigration authorities. We plan that she should resume university residence at her old college,Newnham. Besides this,some of the grant would naturally be available for expenses on books,microfilms,photostats,photographs,drawings and the like.



If this proposal should materialise, it would indeed be a wonderful thing to feel that work for the later volumes was going ahead at a time when I was still bogged down among the proofs of the earlier ones.

The suggestion that some funds should be spent on bringing over Dr Wu Lien-Té to advise us one summer is, as I believe I have already indicated, perfectly acceptable to us. But I should be very sorry if this were to reduce the amount of the grant to us who will actually do the work. Dr Wu's advice would be most valuable to have, but the cost of his travel would be out of proportion to the value of the guidance which we might expect to get, if we had to spend it out of our grant. In other words, if it is an additional proposal for the use of funds which otherwise would not be made available to us at all, then I am all for it, but I would regret it if it were a deduction from funds which we desperately need for the basic work on the project.

There is one more thing which I should like to say. I should not like to give you, or anyone else, the impression that nothing at all has yet been done towards the preparation of the Medical volume. I have bulging dossiers in my filing cabinets on all subjects connected with alchemy, chemistry, chemical industry, pharmaceuticals, physiology and medicine. Only in the coming few days I have to catalogue some dozens of ancient and mediaeval Chinese medical books which Lu Gwei-Djen bought for our collection when on a visit to Hongkong earlier this year. In our microfilms we have all the alchemical and medical books in the Tao Tsang (Taoist Patrology), dating mostly from Thang and Sung times, and of great value because till now hardly known. They were carefully studied by a former collaborator, Tshao Thien-Chhin, before he returned to China, and his notes are ready for our use. We have also been building up recently a working library of Chinese medical books and dictionaries in Lu Gwei-Djen's apartment in Paris, so that if she does stay one or two more years in UNESCO, she can do a lot of reading and other preparation in her spare time. The main point is that it will be some years yet before I myself can devote my full time and energies to the organisation and writing of the relevant volumes.

In the light of all this, I wonder whether you'd now feel it possible to proceed with a definite request to the Wellcome Foundation? Could you frame it in accord with the above account? Wouldn't it be satisfactory and reasonable for us to offer to  earmark  the grant for the work on the chemical-biological-medical volumes, whatever the times may be when this work, either by my helpers or by myself, goes forward?

With many apologies for the length of this letter and with love to Dorothea as well as yourself from us both,

Ever yours,

Joseph Needham



T. I. Williams,

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CS:EH

23rd November 1955

My dear Joseph,

I am much interested in your story of the astronomical clock. It seems to me that extensive gearing need not be native Far Eastern at all. There is some very elaborate gearing now known from Greek sources, as Derek Price would tell you.

I am sure you are fully acquainted with the Dondi clock, on which Alan Lloyd has written. He is doing our article on Horology, which is really very good. Unfortunately he is quite incoherent in the literary sense and the editing of what he writes is very arduous indeed because it is just no good our publishing stuff that we cannot understand ourselves. What is new to me about the Dondi clock is that it contains oval gears. At first I thought they might be ellipses and I got very excited indeed because I thought, 'Here is the ellipse brought into relation with astronomy', but on further investigation it seemed not to be so. I mention this only in case you should also be led off for a short time on a false scent.

To descend to earth, when are you likely to produce your medical volume? My reason for asking this is simply that I want to know how and when to tackle Dale, who, like most of us, is getting older.

With love to you both from us both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge



20th. Nov. 1955

Confidential

My Dear Charles:

Many thanks indeed for your letter of the 16th. enclosing the letter from Morkill of the UCC, which I return to you herewith.

As you say, the position seems not at all unsatisfactory. The actual meeting took place last Wednesday week, and our friends on the committee worked very hard both before and during it. I heard from some of them immediately afterwards what had happened. It seems that the matter did not come to a vote, because the opposition found itself decisively, though not numerically largely, outnumbered. Everyone was therefore in agreement that the grant should be accepted in principle, the exact amount to be determined next March when the budget for the next financial year is prepared. I hear, however, from some of our friends on the committee that the sum of £ 1000 for 5 years is really rather beyond what their budget can run to while leaving room for other things, and so £ 700 for 3 years will probably be proposed instead. Well, that would indeed be a great assistance anyway.

You are certainly right in your impression that things are changing on that committee, for on another issue, that of restoring the customary grant to the Chinese Students' Association in the UK, it did come to a vote, and the reactionaries were simply defeated.

Meanwhile I am pressing on, though greatly impeded, as usual in this term, by biochemical lectures. It has also taken us a long time to finish off all Vol. 2 index, etc. proofs, and to catalogue the large recent accessions to our private collection. If Vol. 2 does beat the dateline of your Vol. 2, it will only just do so, because we cannot now come out before the end of Feb. and probably mid-March.

Remarkable discoveries keep on turning up, however. We've just translated the Hsin I Hsiang Fa Yao of +1086, by Su Sung, which gives a very detailed description of an astronomical clock. This is going to be of cardinal importance because it involved (though worked by a water-wheel and not a falling weight) both an escapement and a lot of gearing. He even gives us a historical account of the development of this kind of time-keeper, which is much more closely ancestral to the European +14th. cent. clocks than the Byzantine-Arab falling-float type. Derek Price is collaborating with us to publish something on this, and I hope to talk to the Horological Society about it on Jan. 11.

I am also excited by the Huo Lung Ching (Fire-Drake Manual), which extensively illustrates gunpowder weapons at a date between +1350 and +1410. No one has studied it properly before!

With love to Dorothea from us both,

Ever yours affectionately,

Joseph



UNIVERSITIES' CHINA COMMITTEE IN LONDON

(Incorporated by Royal Charter).

Telegrams & Cables: *Unchicom, Westcent, London.*

Telephone: *Euston 3736.*

16, GORDON SQUARE,

LONDON, W.C.1.

14th November, 1955.

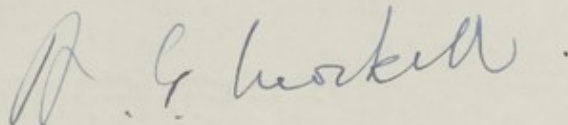
Professor Charles Singer,  
'A History of Technology',  
Thames House,  
Millbank, S.W.1.

Dear Sir,

Dr. Joseph Needham's "Science and  
Civilisation in China".

I refer to your letter of 15th September 1955,  
ref. CS/EH, and am instructed to state that while the  
Executive Council are unable to make a grant during  
the current financial year which ends on the 31st March  
1956, they will give sympathetic consideration to this  
application when they come to prepare the Estimates  
for 1956/57.

Yours truly,



Secretary.



16th November 1955

My dear Joseph,

Enclosed from the Universities' China Committee seems to me satisfactory. In effect it is putting off the matter for six months but otherwise is all that you could ask. Not having heard from the Committee, I wrote asking what had happened and I imagine that this precipitated this letter.

When is your Volume II coming out? I am sure you will beat us because ours won't be out before April.

When are we to see you?

Love to you both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge.

P.T.O.

- C O P Y -

UNIVERSITIES' CHINA COMMITTEE IN LONDON

16 Gordon Square  
London, W.C.1

14th November 1955

Dear Sir,

Dr. Joseph Needham's "Science &  
Civilisation in China"  
-----

I refer to your letter of 15th September 1955  
ref. CS/EH, and am instructed to state that while the  
Executive Council are unable to make a grant during  
1956, they will give sympathetic consideration to this  
application when they come to prepare the Estimates  
for 1956/57.

Yours truly,

(illegible signature)

Secretary.

Dr. Charles Singer.

P.T.O.



9th November 1955

My dear van der Sprenkel,

Have you had any news, official or unofficial, of the action of the Universities' China Committee on the subject of Needham? I gather, since I have heard nothing, that nothing has been done, but is this a permanent situation or do we merely await another meeting or something of the kind?

With kind regards,

Yours sincerely,

CHARLES SINGER

O. P. N. B. van der Sprenkel Esq.  
Department of Oriental History  
School of African & Oriental Studies  
University of London  
London, W.C.1

as from : 1, Owlstone Rd., Cambridge

TELEPHONE: PAR 56.  
STATION: PAR.  
ONE & HALF MILES.

KILMARTH,  
PAR,  
CORNWALL.

25th. Sept. 1955

My Dear Charles :

It seems most extraordinary to be writing to you from Kilmarth, and indeed I think this is the first occasion that I've ever been here in the absence of both you and Dophi. However, it has been extremely kind of Dorothea to let me bring Wang Ling here for the weekend as part of the peregrination on which I'm taking him. The point of this letter, however, is to thank you as quickly as I can for the news which Dophi read me over the telephone from you last night. I really find it hard to express my thanks to you for all your help; it certainly seems now as if the Wellcome Foundation will contribute something towards the cost of preparing the biological-medical volume or volumes. The details of course must be for further consideration, but I wanted to lose no time in assuring you again of the gratitude of

Y<sup>r</sup> very well-wishing and obedient lovyng  
servaunte

Joseph



Room 160,

-----  
CS:EH

22nd September 1955

My dear Joseph,

Two bits of news for you.

(1) I have sent an exact copy of the letter which I sent to the Nuffield Trustees to the Universities' China Committee. The only difference is that I have omitted the names of Professor Simon and Professor Dubs because they are now themselves members of the Committee. The next meeting of the Committee is on September 28, when the matter will be considered.

(2) I went yesterday to see H. H. Dale and had a long talk with him. I know all about your relations with him. I said, and he quite agreed, that the Wellcome Trust should support specifically the medical volume of your history. He not only agreed but further he said that it would give him particular pleasure to support such an idea because of the disputes you and he had had. He would like to demonstrate that the matter was not personal and he felt that this subject was of the kind that would do this. I think that they would grant £1,500 for a year-and-a-half's service of your Chinese assistant and other incidental expenses. We can leave that matter until we have heard the response of the Universities' China Committee.

Dale further made the suggestion that it would be delightful to get Wu Lien Teh to England, perhaps in the summer, possibly to collaborate with you over the medical field. I am personally very fond of Wu Lien Teh, as is Dale himself. He is, of course, now pretty old but he might be tempted to come over on a grant from the Wellcome Trust because he has a son and, I think, a daughter too in England. He is far too old to stand an English winter now, but I should really think he might be tempted for a few months in the summer. This is just a mere suggestion for your consideration.

continued . . . . .

I hear from Dorothea that you are going down to Cornwall just when I am not there. As at present arranged, I come down on the 29th, though I may be delayed for a day or two. Will Dophi be with you ?

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge.



UNIVERSITIES' CHINA COMMITTEE IN LONDON  
(Incorporated by Royal Charter)

Telegrams & Cables: *Unchicom, Westcent, London.*  
Telephone: *Euston 3736.*

16, GORDON SQUARE,  
LONDON, W.C.1.

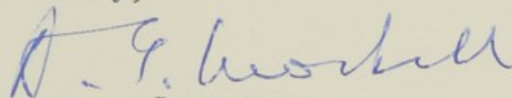
20th Sept. 1955

Professor Charles Singer,  
"A History of Technology",  
Thames House,  
Millbank, S.W.1.

Dear Sir,

I write to acknowledge receipt of your letter dated  
15th September refnceCS/EH on the subject of Dr Joseph Needham's  
"Science and Civilisation in China". which will be considered  
by the Executive Council in due course.

Yours truly,

  
Secretary.

HYTHE 66336.

13 September 1955.

BULLACETON,  
SALTWOOD,  
HYTHE, KENT.

Dear Professor Singer,

I have no objection to the attachment of my name to the letter you are sending to the U.C.C. about a grant to Dr. Newtham though, as I think I said when you first approached me, I doubt very much whether the Council of the Committee will feel able to respond to the appeal. I am merely the F.O. representative on the Council, not a member,



but at the next meeting, which  
is on the 27<sup>th</sup> of this month,  
should presumably your letter  
will be on the agenda, I  
will, as I have done on previous  
occasions, speak in favour.

Yours Sincerely  
V. L. Kitchison.

Room 160,

-----  
CS:EH

The Secretary  
Executive Council  
Universities' China Committee  
University of London  
London W.C.1

15th September 1955

Dear Sir,

The first volume of Science & Civilization in China by Dr. Joseph Needham, F.R.S., was published eleven months ago. Volume II will appear this year. Volumes III and IV are well advanced, and Volumes V to VII are planned and will complete the work. We need not stress the significance for social science of these historical aspects of the only continuous and unified civilization with which those of the Near East and Europe can be reasonably compared. Dr. Needham's project is one of the most important in the whole range of humanistic and social studies that is before the learned world.

Dr. Needham is uniquely equipped for this task by a combination of special scientific training and experience, by previous research in the history of science, by prolonged residence in China, and by extensive technological, social, and linguistic study. To maintain the momentum of the work it is necessary for Dr. Needham to have the help of a Chinese assistant, whose salary together with certain other incidental expenses are at present being borne by Dr. Needham. The project will, it is estimated, be completed in about five years. Dr. Needham will, for all this period, need a suitable assistant and a certain amount of other clerical and literary aid.

continued . . . .



We would suggest to the Universities' China Committee that they allocate to Dr. Needham for his project £1,000 a year for five years, the greater part for the salary of an assistant. We would be obliged if the Committee would address correspondence to Professor Charles Singer, 'A History of Technology', Thames House, Millbank, London S.W.1, who is acting as secretary to the group of appellants.

Yours faithfully,

Margery Fry, J.P., M.A.

Lynda Grier, C.B.E., formerly Principal of Lady Margaret Hall, Oxford.

John Hutchison, K.B.E., Formerly H.M. Charge d'Affaires at Peking.

Julian Huxley, F.R.S., M.A., D.Sc.

C. H. Philips, Professor of Oriental History, University of London.

John Pratt, K.B.E., C.M.G., Vice-Chairman, Governing Body of the School of Oriental and African Studies, London.

E. Pulleyblank, Professor of Chinese, University of Cambridge.

George Sansom, G.B.E., K.C.M.G., Emeritus Professor of Columbia University; formerly Director of the East Asian Institute, New York.

Horace Seymour, G.C.M.G., C.V.O., formerly Ambassador to China.

O. P. N. B. van der Sprenkel, Lecturer in the History of the Far East, University of London.

Arthur Waley, C.B.E., F.B.A., Litt. D.

Frederick Whyte, K.C.S.I., formerly Political Adviser to the National Government of China.

Charles Singer, Hon. Fellow of Magdalen College, Oxford; Emeritus Professor of the University of London.

SCHOOL OF ORIENTAL AND AFRICAN STUDIES

UNIVERSITY OF LONDON, W.C.1

DEPARTMENT OF THE FAR EAST

PROFESSOR W. SIMON

Telephone: MUSEUM 2023/4

Telegrams: SOASUL, PHONE, LONDON

WS/JED/58

8th September, 1955.

Dear Professor Singer,

Professor Simon has asked me to tell you that he has now heard that the meeting of the Executive Council of the Universities' China Committee will be held on Wednesday, 28th September, 1955.

Yours sincerely,

*Jennifer E. Davis.*

Secretary to Professor Simon.

Professor Charles Singer,  
Kilmarth,  
Par,  
Cornwall.



1 TANZA ROAD · LONDON · NW3

Tel. Hampstead 7972

7th Sept. 1955

Dear Professor Lings,

My husband is in Rome at present to attend the Historians' Congress and will not be back until after the date you mentioned.

In his absence I opened your letter. I am sure that you can depend on his support in whatever action you take on behalf of Dr. Needham's work.

Yours sincerely,

Ljilka van der Sprenk

1, WETHERBY GARDENS,  
KENSINGTON S.W. 5.

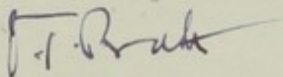
FRE. 2450.

August 31 , 1955

Dear Mr. Singer,

I am sorry indeed to hear that the Nuffield Trustees have refused to make a further grant for Dr. Needham's work. Science and Civilisation in China will rank as the most outstanding work on China ever written. It is a landmark in the relations between China and the West and, as <sup>a</sup> former member of the Scarborough Commission, I can only express my earnest hope that you will be successful in your efforts to obtain a further grant that will enable the work to be carried forward without delay.

Yours sincerely

  
J.T. Pratt

Charles Singer Esquire

Kilmarth

Par,  
Cornwall.



24 St. Andrews Road,

Cambridge

2 September, 1955

Dear Dr. Singer

In reply to your letter of 27<sup>th</sup> August,

I assure you that I have no objection to your  
sending <sup>to the Universities' Change Committee</sup> the letter with my signature attached  
regarding Dr. Needham's book.

Yours sincerely,

E. J. Palleyblank

SCHOOL OF ORIENTAL AND AFRICAN STUDIES

UNIVERSITY OF LONDON, W.C.1

DEPARTMENT OF THE FAR EAST

PROFESSOR W. SIMON

Telephone: MUSEUM 2023/4

Telegrams: SOASUL, PHONE, LONDON

WS/JED/45

31st August, 1955.

Dear Professor Singer,

Thank you for your letter of 30th August. I am afraid I do not yet know when the first Council meeting of the U.C.C. will be held, but I think it likely that it will take place sometime in October.

I shall be writing again as soon as I know more definitely.

Yours sincerely,

*W. Simon*

Professor Charles Singer,  
Kilmarth,  
Par,  
Cornwall.



SCHOOL OF ORIENTAL AND AFRICAN STUDIES

UNIVERSITY OF LONDON, W.C.1

Telephone Number: MUSEUM 2023/4  
Telegrams: SOASUL, PHONE, LONDON

30th August, 1955.

Dear Dr. Singer,

Thank you for your letter of 27th August. Professor Philips is at present away from the School, and I am not sure whether he will return within the next fortnight, though I will of course pass your letter to him as soon as he arrives.

Yours sincerely,

*Dora Bawn*

Secretary to  
Professor Philips

Dr. Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

SENIOR COMMON ROOM,  
UNIVERSITY COLLEGE,  
OXFORD.

29 Aug., 1955.


Dear Mr. Singer,

Thank you for your letter about the application in behalf of Dr. Needham. Will you please omit my name from your application to the Universities China Committee.

My reason is not that I have changed my mind about Dr. Needham, but that I happen to be a member of the U.C.C. Council, before which your application will undoubtedly come. I shall speak in Dr. Needham's behalf.

The U.C.C. has had a great deal of trouble with certain Chinese Communists in London and Manchester. You will recognize the implications.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Homer A. Dubois". The signature is written in a cursive style with a large, stylized initial "H".



Chandos Lodge,

Eye,

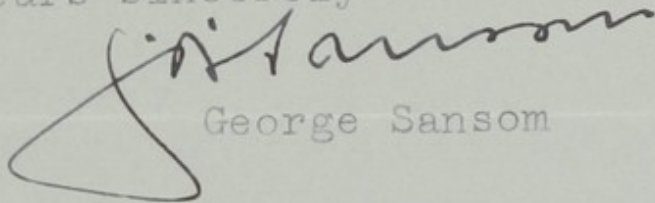
August 29, 1955

Suffolk.

Dear Dr. Singer,

Yes, indeed. I shall be pleased to sign your application to the Universities China Committee on behalf of Dr Needhams project.

Yours sincerely

A handwritten signature in cursive script, appearing to read 'G. Sansom', written over the typed name.

George Sansom

30th August 1955

Dear Professor Simon,

Thank you for your letter of August 29. I quite understand that you cannot sign the application for Joseph and I am very glad indeed of the reason.

Could you perhaps give me some idea of the date at which the matter can be considered by the Universities China Committee ?

I am thinking of also speaking to Sir Henry Dale to ask if the Wellcome Foundation would consider helping with the medical volume. I think if it were known that the matter had the blessing of the China Committee, the Wellcome Trustees would probably consent. As always, it is the first step that costs.

Yours sincerely,

CHARLES SINGER

Professor W. Simon  
School of Oriental and  
African Studies  
University of London  
London, W.C.1



SCHOOL OF ORIENTAL AND AFRICAN STUDIES

UNIVERSITY OF LONDON, W.C.1

DEPARTMENT OF THE FAR EAST

PROFESSOR W. SIMON

Telephone: MUSEUM 2023/4

Telegrams: SOASUL, PHONE, LONDON

WS/JED/42

29th August, 1955.

Dear Professor Singer,

Thank you for your letter of 27th August. I am sorry to hear that the Nuffield Trustees turned down your application. I am a member of the Executive Council of the Universities China Committee, and shall be glad, as such, to support your application. For the same reason, however, I feel my name should not appear on the application.

Please forgive if this letter goes without my signature, because I only come up rarely to town at present.

Yours sincerely,

W. SIMON. *JED*

Professor Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

30th August 1955

My dear Julian,

A few years ago I started writing a centenary history of the Cancer Hospital. Nothing came of it and I dropped it. The basic trouble was that the place had had a rather disreputable history which had to be skilfully covered - more skilfully than was within my literary powers. I did, however, begin to go over the subject with some little care. By far the best general book on it that I found was E.C. Dodd's Penguin.

I think the first person who realised that cancer is a cellular condition was Valentin, then a Professor somewhere in Switzerland, and his effective paper was about 1837, at any rate before Schwann and certainly before Virchow. The essential new discovery seemed to me to be the extraordinary vitality of living cells in general and cancer cells in particular at very low temperatures. This is just a line that may possibly aid you on your way.

As regards the Rockefeller Foundation for Joseph, I think they have become rather allergic to humanistic subjects. I am going to try Dale for the medical volume, in connection with the Wellcome Foundation, but I am told that there is now good hope of the Universities China Committee. At any rate, we had better wait a few weeks before we hear from them.

Yours ever,

CHARLES SINGER

Dr. Julian Huxley, F.R.S.  
31 Pond Street  
Hampstead  
London, N.W.3



31, Pond Street,  
Hampstead, N.W.3  
Telephone: Hampstead 5908

Aug. 28th, 1955

Dr. Charles Singer  
Kilmarth  
Par, Cornwall.

Dear Dr. Singer,

Thank you for your letter of Aug. 27th.

I shall be very glad to let my signature go forward to the letter to the Universities China Committee on behalf of Dr. Needham.

Yours sincerely

*Julian Huxley*

Julian Huxley

*It is too bad that the Nuffield has  
been turned down. If the China Com  
also does so, I suggest asking the Rockefeller  
Foundation - I have to do it myself in mind at, & shall be seeing Warren Coover  
them - I could speak to him on the matter if you wished. If I am leaving*

a desperate time at present - I was captured & pulled  
into giving the 1<sup>st</sup> Alfred Sloan Lecture to the Sloan  
Kettering Inst. for Cancer Research - I told them I  
know nothing particular about cancer, but they said  
they wanted a "General Biological view" - However,  
a view worth of something, & I am now spending all  
my spare time reading, marking, & elaborating  
unwisely digesting the subject with a view to later republication.  
Meanwhile I have given a solid sermon to the PA  
at the Inst. as well Sunday on 'Science & (w) - the  
Intestestic appeal' - I meant say that cancer  
& its cure presents a more difficult problem!  
By now J.H.



27th August 1955

Dear

You will remember that in July of this year I obtained your signature to an application to the Haffield Trustees for a grant for Dr. Hoedham to prosecute the work on his Science and Civilization in China. On July 31 the Haffield Trustees replied that they felt unable to make this grant.

I propose therefore to send an identical letter to the Universities China Committee, attaching to it the same names as in the previous letter.

If you have any objection to this, I should be greatly obliged if you would let me know within the next fortnight.

Yours sincerely,  
Miss Margery Fry, J.P., M.A.  
48 Clarendon Road  
London, W.11

Dr. Julian Huxley, F.R.S.  
31 Pond Street  
Hampstead,  
London, N.W.3

CHARLES SINGER

Sent to :

(No) X Professor H. H. Dubs  
133A Banbury Road  
Oxford

Dr. Lynda Grier, C.B.E., M.A.  
Flat 4A  
Lansdowne House  
Lansdowne Road  
London, W.11

Sir John Hutchison, K.B.E.  
Bullaceton  
Saltwood  
Hythe, Kent

(Yes) - by phone  
(No) X Professor C. H. Philips } School of Oriental  
(Yes) X Professor W. Simon } and African Studies  
(Yes) X O.P.N.B. van der Sprenkel } University of London  
London, W.C.1

(Yes) ✓ Sir John Pratt, K.B.E., C.M.G.  
1 Wetherby Gardens  
London, S.W.5

(Yes) Professor E. G. Pulleyblank  
24 St. Andrew's Road  
Cambridge

(Yes) Sir George Sansom, G.B.E., K.C.M.G.  
Chandos Lodge  
Eye, Suffolk

Sir Horace Seymour, G.C.M.G., C.V.O.  
Bratton House  
Westbury, Wilts.

Sir Frederick Whyte, K.C.S.I.  
33 Sussex Lodge  
London, W.2

Dr. Arthur Waley, C.B.E.M., F.B.A.  
50 Gordon Square  
London, W.C.1



TELEGRAMS:  
"GO GO MEN, PICCY, LONDON."  
TELEPHONE: WHITEHALL 6942.

as from:

1, Owlstone Road,  
Cambridge

OXFORD & CAMBRIDGE UNIVERSITY CLUB,

PALL MALL, S.W. 1.

at: La Fosse Beauregard  
Chenu, Sarthe, France

24th. Aug. 1955

My Dear Charles:

Thank you so much for your two letters of the 9th. and the 19th. It will, I am sure, be an excellent thing to send the appeal to the Universities China Committee, whether immediately favourable results are forthcoming or not.

It is very kind of you to be thinking about the biological and medical volume too, and to suggest new approaches to the medical Foundations. Actually, the chemical-biological-medical volumes are becoming a live issue rather earlier than I had expected, for it seems likely that a potential further Chinese collaborator, trained originally in traditional Chinese pharmacy, nutritional science, and medicine, but with a Cambridge doctorate and long laboratory experience as well as good acquaintance with the classical language, may become available next year to join our group. This precious help would be something which I should not like to have to do without.

Regarding the Gulbenkian Foundation, I suppose there is no reason why I should not write to Lord Radcliffe presently asking for information about its frame of reference.

*With love to Dorothea from us both*

*Ever yours affectionately, Joseph*



19th August 1955

My dear Joseph,

Many thanks for your letter of 9th August.

As soon as I can get in touch with the people at the School of Oriental Languages we will open the ball with the China Academic Committee. I don't think it is any use doing anything in August. What I propose to do, if Simon, Philips and van der Sprenkel agree, is to send exactly the same appeal by exactly the same names to the China Committee. My latest information is, as I told you, that that Committee is very much more inclined to be helpful to you than it was previously.

I don't know Lord Radcliffe but everybody must be at him. At any rate, I don't see that anything can be done with the Gulbenkian Bequest until we know its terms. On the other hand, I feel sure that I have enough influence with Dale to persuade him to give a grant from the Wellcome Fund at least for your volume on medicine. When that has taken some sort of shape I will certainly have a go at him. I shall probably be seeing him early in September. I don't think you need fear his reactions on other matters.

Any hope of seeing you both here ?

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
chez Dr. Lu Gwei-Djen  
12 Rue Degas, Paris XVIe  
France



as from 1 Owlstone Road  
Cambridge  
England

chez Dr Lu Gwei-Djen  
12, Rue Degas, Paris, XVIe  
France

5th. August, 1955

My Dear Charles:

Your sad news about the Nuffield Foundation reached me just as I was setting out on my greatly-needed holiday. Dophi and I are distressed for you, as well as on my account, after all the generous trouble which you have taken in this cause. However, although we can know nothing of the inwardness of it, we feel hesitant to ascribe it wholly or even partly to political prejudice, for we believe that the Foundation has always specialised on projects with a medical angle, and my book, though 5 volumes and more have been completed, has not yet reached that stage. Naturally I should be very interested to know the reasons for the refusal to help, if you can ever find them out.

As regards the Universities' China Committee, I believe (though I am not sure) that it has funds much more than adequate for the request we are making. For many years past it has not been able to spend anything on its chief original purpose, that of bringing over to this country Chinese students and professors. But though things may have improved recently, a knot of very inimical men still wields great influence there. You probably heard that Sir Alwyne Ogden, using his casting-vote at the last meeting, succeeded in postponing once more my membership of the Committee, which the Cambridge orientalist had pressed for. Therefore although I doubt whether any good results would follow, I think it would be an excellent thing if the letter with all its signatures could, as you suggest, be sent officially to the Committee. I presume it would be easy to get the agreements of the signatories to the use of the letter vis-à-vis other trusts than the Nuffield? Some day, if not too much trouble, I should greatly like to have the full list.

As regards other possible Foundations, I rather feel that at the Athenaeum you are much more in the centre of things than I am. I couldn't hope to better any advice which your friends in London might give. However, I have noticed lately with interest the setting up of the Gulbenkian Foundation - concerning which I enclose relevant recent cuttings from the Times. Do you know Lord Radcliffe personally, or anything about him? In view of Gulbenkian's Armenian connections would it not be very suitable for his Foundation to support a large work particularly dedicated to the increase of better mutual understanding between the cultures of East and West? An approach to the Gulbenkian Foundation might be particularly fruitful in the initial stages before their plans had had time to become very crystallised and so to exclude projects of the type which mine happens to be. What do you think?

Ever yours affectionately,

Joseph

Once again - heartfelt thanks  
for all your encouragement and effort!  
(Dophi is joining me soon and we are going to the Internat. History Congress at Rome).



## MR. GULBENKIAN'S WILL

### MOST OF MONEY FOR NEW FOUNDATION

#### LISBON HEADQUARTERS

LISBON, July 22.

Mr. Gulbenkian left the bulk of his fortune to create a Gulbenkian foundation for charitable, artistic, educational, and scientific purposes to benefit people of all nationalities, it was announced here today.

His art collections are to go to this institution, which will have its headquarters in Lisbon and will be administered under Portuguese law on the lines of the Rockefeller Foundation.

A service for Mr. Gulbenkian was conducted today in the British cemetery chapel by the Rev. Boswark Tommahan, who had flown from London, where he is chaplain of the Armenian church. Mr. Tommahan is to be flown to Zurich for the cremation.

Dr. José de Azeredo Perdigão, Mr. Gulbenkian's lawyer for the past 13 years, did not indicate the size of the fortune. He said that there were important legacies to the family, which would enable them to lead "a royal life." These gifts and trusts will come under British law, according to the terms of the will. The family comprises Mr. Nubar Gulbenkian, son, Mrs. Rita Esayan, daughter, Mr. Kevoik Esayan, son-in-law, and Mr. Mikael Esayan, grandson.

#### FOUR BASIC RULES

The basic rules laid down for the Calouste Gulbenkian Foundation in the will are:

(i) It is to be perpetual, with headquarters in Lisbon, but branches in any part of the civilized world as deemed necessary; (ii) Its purposes are charitable, artistic, educational and scientific; (iii) Its action will extend to any country, as desired; (iv) It will be administered by three trustees, Lord Radcliffe, a friend of Mr. Gulbenkian for 40 years, Dr. Perdigão, his lawyer, and Mr. Kevoik Esayan, his son-in-law.

The will authorizes the trustees to dispose freely of the estate, in whatever place, and without necessity of an inventory, to give full execution to the dispositions of the will. It provides that the foundation shall maintain all subsidies that Mr. Gulbenkian was paying at his death to individuals, charitable, artistic, religious, and scientific institutions, including the Yedig-Kale Hospital in Istanbul and the Gulbenkian Library in Jerusalem, and certain pensions.

The lands of Salamat Han in Istanbul are left to the hospital of Yedig-Kale, with the express obligation to look after the tombs of his parents and to continue the celebration of Masses for their souls. The will states that Mr. Gulbenkian wanted to pay before his death the expenses necessary to restore the fourth-century cathedral of the ancient city of Echmiadzin, in Soviet Armenia, seat of the Armenian Church, in order to perpetuate the memory of his parents, but "local circumstances and various difficulties" prevented it.

#### CATHEDRAL FUND

His will asks the trustees to set aside a fund of \$300,000 to \$400,000 for this purpose and to use it in accordance with the wishes of the Armenian Church as soon as circumstances permit. But he stated that nothing useful could be done until agreement was reached between the Supreme Patriarch and the Soviet Government, and a formal and irrevocable promise secured from the Soviet Government that the money would be used exclusively for the restoration of the cathedral. Such an agreement had not been obtainable up to now, he stated. He urged the trustees to take strict measures of control, and if necessary to send an architect to the spot.

Dr. Perdigão said in announcing the terms of the will that Mr. Gulbenkian had arrived in Portugal in 1942 seeking refuge and peace. "He found both, and the social order which led him to make Portugal his residence. At the end, as proof of his gratitude to the Portuguese people and Government, he gave Portugal most of his fortune. This is a great honor for Portugal. May God give me life to carry out the high ideals of Mr. Gulbenkian's will." He added that the body was to be cremated because the will expressed a wish to that effect. The will was read to the family this morning.

#### LAWSUIT SAFEGUARD

Mr. Gulbenkian inserted a clause whereby any beneficiary contesting the will would automatically lose his share. If the beneficiary's claim was upheld in a foreign court, he would have to return to the foundation trust everything he had received from Mr. Gulbenkian during his lifetime.

The lawyer said that Mr. Gulbenkian suggested that the trustees could appoint either full or temporary trustees if they were needed. He mentioned his son Nubar and his grandson, Mikael Esayan, as possible choices. The will provides that, in addition to free donations, each member of the family receives a trust fund, the interest of which they will receive during their lifetime, after which the capital will revert to the foundation. The foundation trustees will administer these trusts.—Reuter.

#### LORD RADCLIFFE'S COMMENT

Lord Radcliffe, who is 56, has been a Lord of Appeal in Ordinary since 1949, having been created a life peer in that year. He said in London yesterday that because he held that office he was not at present free to act as a trustee of the Gulbenkian Foundation.

"It was always Mr. Gulbenkian's hope," Lord Radcliffe continued, "that I should become chief trustee of the foundation, which is a very wonderful foundation. But he realized, as I did, that I could not take that position so long as it conflicted with my commitments as Lord of Appeal. The question is when, or whether, I can be freed from those commitments. I can take no decision at the moment."

Lord Radcliffe explained to a representative of *The Times* that it would first be necessary for him to approach the highest authorities to learn whether in their view it would be right for him to ask to be relieved of his legal duties. As chief trustee of the foundation he—or anyone else—would not necessarily have to live in Portugal, but the work would clearly involve maintaining close touch with Lisbon, as this was to be a Portuguese foundation.

Foundation





THE NUFFIELD FOUNDATION

PATRON: H. M. QUEEN ELIZABETH THE QUEEN MOTHER

CHAIRMAN: THE HON. GEOFFREY C. GIBBS. DIRECTOR: LESLIE FARRER-BROWN

Nuffield Lodge, Regent's Park, London NW1

PRImrose 8871-5

Telegrams: Nuffound Norwest London

C.V.

6th July, 1955.

Dear Professor Singer,

Thank you for your letter of the 4th July.  
I will add to the list of those who signed the letter  
about Needham the names of Julian Huxley and Miss Margery  
Fry.

Yours sincerely,

*L. Farrer-Brown*

Professor Charles Singer,  
"A History of Technology",  
Room 160,  
North Block,  
Thames House,  
Millbank,  
London, S.W.1.

31, Pond Street,  
Hampstead, N.W.3  
Telephone: Hampstead 5908

July 6 1955

Dear Charles

Thanks for your letter &  
for adding my name to the  
album - would it not be  
relevant to add to my  
name "Vice-President of the  
Commission for the  
Unesco Scientific & Cultural  
History; late Director General,  
Unesco." It is through  
Unesco & the History that  
I feel the importance  
of the Needham work.

Alan, this year it  
doesn't look as if we  
were likely to get down  
to the West Country -



at least not this summer.

Perhaps in the autumn!

Best wishes

Yours ever

Julian Huxley

---

Room 160,

---

CS:EH

4th July, 1955

My dear Julian,

I have just heard from Sir Horace Seymour that you would have liked to sign the appeal to the Nuffield Foundation on behalf of Joseph Needham. I have added your name to the letter, of which I enclose a copy. In fact, the Trustees meet some time at the end of this month so that I was not too late.

I wish you and Juliette could see your way to visit us again.

Yours ever,

CHARLES SINGER

Dr. Julian Huxley, F.R.S.  
31 Pond Street  
Hampstead  
London, N.W.3



Room 160,

-----  
CS:EH

4th July, 1955

Dear Mr. Farrer-Brown,

I have just heard from Julian Huxley that he would like his name to be added to the list of those who signed the letter concerning Needham.

If it is not too late perhaps you would attend to this. I am sorry for this delay; I had in fact not asked Huxley simply because he is not closely associated with China, but I am quite sure that all those who have signed would be delighted to have his name added.

I am very sorry indeed to give you this extra trouble.

Yours sincerely,

CHARLES SINGER

L. Farrer-Brown Esq.  
The Director  
The Nuffield Foundation  
Nuffield Lodge  
Regent's Park  
London, N.W.1

Room 160,

-----  
CS:EH

4th July 1955

Dear Sir Horace,

Many thanks for your letter.

I have added Julian Huxley's name. In fact, the Nuffield Trustees do not meet until the end of this month so that we are in time.

I have today heard that there is also a very fair chance that the China Committee would be helpful. It looks as though there might be something in the nature of competition in well-doing! I am sure your experience accords with mine that this is a rare event in this vale of tears.

Yours sincerely,

CHARLES SINGER

Sir Horace Seymour, G.C.M.G., C.V.O.  
Bratton House  
Westbury, Wiltshire.



BRATTON HOUSE,  
WESTBURY, WILTSHIRE.

BRATTON 231.

June 3rd, 1955.

Dear Dr. Singer:-

I happened to meet Julian Huxley yesterday at a party and, talking to him of Joseph Needham, whom he knows well, I mentioned the difficulties about his finance which you are trying to surmount. Huxley said he would be only too glad to help in any way and in fact seemed slightly hurt that he had not been asked to do so. If therefore it is not too late you might think it worth while to communicate with him. He said I might let you know of his readiness to help.

Yours sincerely,

*Grace Seymour*

Room 160,

-----  
CS:EH

30th June 1955

Dear Mr. Farrer-Brown,

Many thanks for your letter of June 29.

It happens that today my one belated signature has come in. It is that of Miss Margery Fry. Perhaps you would be so kind as to add her name to the list in our application. It is late because she has been and still is in Sweden.

Yours sincerely,

CHARLES SINGER

L. Farrer-Brown Esq.  
The Director  
The Nuffield Foundation  
Nuffield Lodge  
Regent's Park  
London, N.W.1



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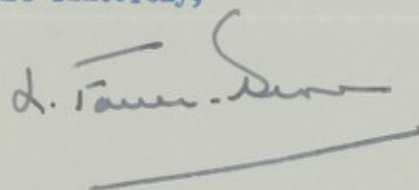
C.VII/6

29th June, 1955.

Dear Professor Singer,

Thank you for your letter of the 28th June about the grant required by Dr. Joseph Needham for his project relating to science and civilisation in China. I will bring this matter to the notice of the trustees when they meet at the end of July.

Yours sincerely,



Professor Charles Singer,  
'A History of Technology',  
Thames House,  
Millbank, S.W.1.

Björko Ormö Sweden - 27. VI. 55

Dear Dr. Singer

I can't flatter myself that the enclosed signature will have any weight with the Nuffield Trust, but am glad to send it.

I'm afraid there is little chance of our meeting, as I expect to be here for another fortnight.

My cordial greetings to you  
Gott!

Yours sincerely  
Harry Fry

(Excuse scrap of paper!)



16th June 1955

The first volume of Science & Civilization in China by Dr. Joseph Needham, F.R.S., was published eight months ago. Volume II will appear this year. Volumes III and IV are well advanced, and Volumes V - VII are planned and will complete the work. We need not stress the significance for social science of these historical aspects of the only continuous and unified civilization with which those of the Near East and Europe can be reasonably compared. Dr. Needham's project is one of the most important in the whole range of humanistic and social studies that is before the learned world.

Dr. Needham is uniquely equipped for this task by a combination of special scientific training and experience, by previous research in the history of science, by prolonged residence in China, and by extensive technological, social, and linguistic study. To maintain the momentum of the work it is necessary for Dr. Needham to have the help of a Chinese assistant, whose salary, together with certain other incidental expenses, is at present being borne by Dr. Needham. The project will, it is estimated, be completed in about five years. Dr. Needham will, for all this period, need a suitable assistant and a certain amount of other clerical and literary aid.

We would suggest to the Nuffield Trustees that they allocate to Dr. Needham for his project £1,000 a year for five years, the greater part for the salary of an assistant. We would be obliged if the Trustees would address correspondence to Professor Charles Singer, 'A History of Technology', Thames House, Millbank, London S.W.1, who is acting as secretary to the group of appellants.

Margery Fry

- C O P Y -

A HISTORY OF TECHNOLOGY

Room 160, North Block, Thames House, Millbank, London S.W.1

28th June 1955

Dear Mr. Farrer-Brown,

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Yours faithfully,

H. H. Dubs, Professor of Chinese, University of Oxford.

Lynda Grier, G.B.E., formerly Principal of Lady Margaret Hall, Oxford.

John Hutchison, K.B.E., formerly H.M. Chargé d'Affaires at Peking.

G. H. Philips, Professor of Oriental History, University of London.

continued . . . . .



John Pratt, K.B.E., G.M.G., Vice-Chairman, Governing Body of the School of Oriental and African Studies.

E. Pulleyblank, Professor of Chinese, University of Cambridge.

George Sansom, G.B.E., K.C.M.G., Emeritus Professor of Columbia University; formerly Director of the East Asian Institute, New York.

Horace Seymour, G.C.M.G., C.V.O., formerly Ambassador to China.

W. Simon, Professor of Chinese, University of London.

O. F. N. B. van der Sprenkel, Lecturer in the History of the Far East, University of London.

Arthur Waley, C.B.E., F.B.A., Litt. D.

Frederick Whyte, K.C.S.I., formerly Political Adviser to the National Government of China.

Charles Singer, Hon. Fellow of Magdalen College, Oxford; Emeritus Professor of the University of London.

Later additions :

Miss Margery Fry

Dr. Julian Huxley, F.R.S.

L. Farrer-Brown Esq.  
The Director  
The Nuffield Foundation  
Nuffield Lodge  
Regent's Park  
London, N.W.1

16th June 1955

L. Farrer-Brown

PR:rose  
8871

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- D R A F T -

27th June 1955

- ✓ ~~Professor~~ H. H. Dubs, Professor of Chinese, University of Oxford.
- ✓ ~~Dr.~~ Lynda Grier, C.B.E., *Formerly Principal of Lady Margaret Hall, Oxford.*
- ✓ ~~Sir~~ John Hutchison, K.B.E., formerly H.M. Charge d'Affaires at Peking
- Professor C. H. Philips, Professor of Oriental History, University of London.
- ✓ ~~Sir~~ John Pratt, K.B.E., C.M.G., *Vice-Chairman, Governing Body of School of Oriental & African Studies.*
- ✓ ~~Professor~~ E. Pulleyblank, Professor of Chinese, University of Cambridge
- ✓ ~~Sir~~ George Sansom, ~~Emeritus~~ G.B.E., K.C.M.G., Emeritus Professor of Columbia University; formerly Director of East Asian Institute, N.Y.
- ✓ ~~Sir~~ Horace Seymour, G.C.M.G., C.V.O., former Ambassador to China.
- ✓ ~~Professor~~ W. Simon, Professor of Chinese, University of London.
- O. P. N. B. van der Sprenkel, ~~B.Sc.~~, Lecturer in the History of the Far East, University of London.
- ✓ ~~Dr.~~ Arthur Waley, C.B.E., F.R.S.
- ✓ ~~Sir~~ Frederick Whyte, K.C.S.I. *✓ 2 6 5 5 5 5*

*Charles Singer Hon Fellow of Magdalen College, Oxford  
Emeritus Professor of the University of London, ~~Secretary~~  
of 'A History of Technology' to whom the  
answer should be addressed*



Sir Frank Engledow,  
C.M.G. F.R.S.

School of Agriculture  
Cambridge.

3 17 9 - 2 11

20 54

---

Sir John Stopford, M.B.E. F.R.S.  
etc.

The Firs  
Rusholme, Here.

---

Sir Hector Hetherington  
K.B.E.

The Principal's Lodging  
The University, Glasgow.



TELEPHONE  
WHITEHALL 4843  
TELEGRAMS  
% HELLENIST (PICCY)

THE ATHENÆUM  
PALL MALL S.W.1

W. Simon Prof. of Chinese  
Sc. of Oriental Langs.  
C. H. Phillips Prof. Oriental  
Hist. Sch. of Orient.  
E. S. Pulleyblank Prof. of  
Chinese at Camb.  
F. Homer H. Dubs, Prof. of  
Chinese at Oxford  
Earl of Scarborough set Phillips line  
Sir John Hatchinson <sup>KB</sup> Mem. of U.C.C.  
Was diplomat in Persia  
Discuss with Phillips over  
phone - but not till

Monday  
Prof. Etienne Balázs  
68 Avenue de la République  
Paris XI<sup>e</sup>

Prof. Wolfgang Franke  
Hamburg University

R. A. Butler  
Sir George Whyte  
Lady Whyte

T.O.



Min Lunda Eric - <sup>(Petered)</sup> L.M.H.  
B.C. representative in  
China 1848-9

Min Mayer Fry.

Young Lindsay of Borneo now  
in Canberra

C/O Australian Nat. Univ.  
Research Fellow

C. P. Fitzgerald Prof. of Chinese  
at A.N.U.

Sir John Pratt



WHITEHALL 4010

27 June 55

STABLE YARD

ST. JAMES'S PLACE, S.W.1.

Dear Professor Singer,

In reply to your  
letter of 21<sup>st</sup>, I never sign round  
notions to the Press or other parties:  
I regret I must decline to sign  
your proposed letter to the Napfield  
Trustees.

Yours very truly,

Scarbrooke

FROM THE PRINCIPAL  
SIR HECTOR HETHERINGTON  
TEL. KELVIN 2231.

THE UNIVERSITY,  
GLASGOW, W.2

Your Ref:- CS:EH  
Our Ref:- D1187.

23rd June, 1955.

Dear Professor Singer,

Thank you for your letter relating to the communication to the Nuffield Foundation. I have read it with interest. But, as it happens, I shall be in London for only one day before the beginning of August and that is already very crowded, so that there is no possibility of a meeting. But I think the proposal is reasonably self-explanatory.

Yours sincerely,

*Hector Hetherington*

Professor Charles Singer,  
Room 160,  
North Block,  
Thames House,  
Millbank,  
London, S.W.1.





SIR JOHN STOPFORD, M.D., F.R.S.  
Vice-Chancellor.

FROM  
THE VICE-CHANCELLOR,  
THE UNIVERSITY,  
MANCHESTER, 13

Telephone: ARDwick ~~4004~~ 3333

23rd June, 1955.

Dear Professor Singer,

Thank you for your letter of June 22nd and enclosure regarding an approach to the Trustees of the Nuffield Foundation. I should be very glad to have a chance of meeting you but it so happens that I have recently been in London twice and am not expecting to be there again until about the middle of July when I have a very quick visit and I regret to say every moment occupied. I cannot prolong that visit since I have to come back for a meeting of the University Council, which being the last this session, is a particularly important one. If, however, I have to arrange another trip to London before the beginning of August I will certainly get in touch with you so that we may meet.

Yours sincerely,

*John S. S. Stopford*

Professor C. Singer,  
Room 160, North Block,  
Thames House,  
Millbank,  
London, S.W.1.

Confidential

My Dear Charles:

I hasten to thank you most warmly for your letter of yesterday's date, telling me of the remarkable and encouraging results of your démarche to obtain some support for my project, and research assistant. Although of course one cannot foretell what the reactions of the Foundation will be, I know you will appreciate the depth and sincerity of my feelings of gratitude to you for taking such extraordinary trouble to find some help for me. It is highly encouraging that so distinguished a group of people have been willing to join together for this purpose.

At the present time I am working full time on the correction of the page proof of vol. 2, which should appear in the autumn. Wang Ling is not able to give me any help just now, as it is the period just before the latest possible date for submitting his Ph.D. thesis. I hope to take him away for a well-earned holiday next month.

You will be interested to know (although of course the matter is still highly confidential) that just recently the first steps have been taken here towards proposing the establishment of a chair at Cambridge in the history and philosophy of science. There will be, however, a long distance between the cup and the lip, for the proposal concerns the coming quinquennium as a whole, and there is no telling whether the highest authorities in the university will wish to include it in their overall plan vis-à-vis the universities grant committee - even though I have reason to think that the latter would view the suggestion very favourably. Some here think that in the meantime an effort ought to be made to secure endowment of the kind necessary from one of the Foundations, but no concrete plan for this has been put forward. What we all visualise is (a) a professor to take charge of the department, (b) an actual department with two more lecturers besides Hall and Hanson, one to double the part of Curator, (c) adequate space for the Whipple Collection, and its valuable library. How and when all this can be obtained, only the gods know.

With love to Dorothea, to whom Dophi will be writing:

Ever yours,

Joseph



Room 160,

-----  
CS:EH

CONFIDENTIAL

22nd June 1955

My dear Joseph,

I am addressing a letter, of which I enclose a copy, to the Nuffield Trustees. I have already the signatures of Professor Dubs, Sir John Hutchison, Professor Philips, Professor Pulleyblank, Sir George Sansom, Sir Horace Seymour, Professor Simon, Mr. van der Sprenkel, and Dr. Arthur Waley. I have had no refusals nor even any sign of reluctance. There are several names that I shall add if thought desirable, and I have written to Sir John Stopford, Sir Hector Hetherington and Sir Frank Engledow, asking if I could meet them in London.

I have a feeling that this matter will go through all right.

Yours ever,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.  
1 Owlstone Road  
Cambridge

Room 160,

-----  
CS:EH

22nd June 1955

Sir Frank )  
Sir John )  
Dear Sir Hector, )

We are proposing to address a letter, of which I enclose a copy, to the Huffield Trustees. It has been signed by the following :

Professor H. H. Dubs, Professor of Chinese, University of Oxford.  
Sir John Hutchison, formerly H.M. Charge d'Affaires at Peking.  
Professor C. H. Philips, Professor of Oriental History, University of London.  
Professor E. Pulleyblank, Professor of Chinese, University of Cambridge.  
Sir George Sansom, Emeritus Professor of Columbia University and former Director of the East Asian Institute, N.Y.  
Sir Horace Seymour, former Ambassador to China.  
Professor W. Simon, Professor of Chinese, University of London.  
Mr. O. P. N. B. van der Sprenkel, Lecturer in the History of the Far East, University of London.  
Dr. Arthur Waley.

Other names of those associated with China and Chinese studies are coming in and we have had no refusals or reluctances.



Should you be in London in the near future I should be grateful if I might have a word with you on this question. I shall be here until the beginning of August.

Yours sincerely,

CHARLES SINGER  
Emeritus Professor of the University of London  
Honorary Fellow of Magdalen College, Oxford.

Also sent to Sir Frank Engledow, C.M.G., F.R.S.  
School of Agriculture  
Cambridge

with the following paragraph added :

I do not know whether you are a Nuffield Trustee but if not would you perhaps sign this appeal ?

Sir Hector Hetherington, K.B.E.  
The Principal's Lodging  
The University  
Glasgow.

Sir John Stopford, M.B.E., F.R.S. etc.  
The Firs  
Rusholme  
Manchester

Room 160,

-----  
GS:EH

21st June 1955

Dear Dr. Grier,

Would you be so kind as to sign the enclosed, which I have already sent to Professor Dubs, Sir John Hutchison, Professor Philips, Professor Pulleyblank, Sir George Sansom, Sir Horace Seymour, Professor Simon, Mr. van der Sprenkel, Dr. Arthur Waley, and to a few others, who have all signed it.

If there is anything that you would like to change in it I would endeavour to meet your wishes if they agree with those of the others who sign it. If you can see no serious fault in it I will draw it up formally, addressing it to the Nuffield Trustees, and will let you have an exact copy before it goes.

Yours sincerely,

CHARLES SINGER

Emeritus Professor of the University of London  
Honorary Fellow of Magdalen College, Oxford

Sir John Pratt, K.B.E., C.M.G.  
1 Wetherby Gardens  
London S.W.5

Dr. Lynda Grier, C.B.E., M.A.  
Flat 4A  
Lansdowne House  
Lansdowne Road  
London, W.11

Sir Frederick Whyte, K.C.S.I.  
33 Sussex Lodge  
London, W.2.

The Right Honourable the  
Earl of Scarborough  
St. James's Palace, S.W.1



Room 160,

-----  
CS:EH

21st June 1955

Dear Miss Fry,

Would you be so kind as to sign the enclosed, which I have already sent to Professor Dubs, Sir John Hutchison, Professor Philips, Professor Pulleyblank, Sir George Sansom, Sir Horace Seymour, Professor Simon, Mr. van der Sprenkel, Dr. Arthur Waley, and to a few others, who have all signed it.

If there is anything that you would like to change in it I would endeavour to meet your wishes if they agree with those of the others who sign it. If you can see no serious fault in it I will draw it up formally, addressing it to the Nuffield Trustees, and will let you have an exact copy before it goes.

This is a formal letter but I would like to add kind wishes from Dorothea and myself. We are in Town for a few weeks. Is there any chance of seeing you ?

Yours sincerely,

CHARLES SINGER

Emeritus Professor of the University of London  
Honorary Fellow of Magdalen College, Oxford

Miss Margery Fry, J.P. M.A.  
48 Clarendon Road  
London, W.11

16th June 1955

The first volume of Science & Civilization in China by Dr. Joseph Needham, F.R.S., was published eight months ago. Volume II will appear this year. Volumes III and IV are well advanced, and Volumes V - VII are planned and will complete the work. We need not stress the significance for social science of these historical aspects of the only continuous and unified civilization with which those of the Near East and Europe can be reasonably compared. Dr. Needham's project is one of the most important in the whole range of humanistic and social studies that is before the learned world.

Dr. Needham is uniquely equipped for this task by a combination of special scientific training and experience, by previous research in the history of science, by prolonged residence in China, and by extensive technological, social, and linguistic study. To maintain the momentum of the work it is necessary for Dr. Needham to have the help of a Chinese assistant, whose salary together with certain other incidental expenses are at present being borne by Dr. Needham. The project will, it is estimated, be completed in about five years. Dr. Needham will, for all this period, need a suitable assistant and a certain amount of other clerical and literary aid.

We would suggest to the Nuffield Trustees that they allocate to Dr. Needham for his project £1,000 a year for five years, the greater part for the salary of an assistant. We would be obliged if the Trustees would address correspondence to Professor Charles Singer, 'A History of Technology', Thames House, Millbank, London, S.W.1, who is acting as secretary to the group of appellants.



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*Howard W. Dubs*

FLAT 4A, LANSDOWNE HOUSE,  
LANSDOWNE ROAD, LONDON, W.11  
PARK 6001

22 June 1955

Dear Professor Singer

I enclose the paper you sent which I  
have signed with pleasure.

Yours sincerely

*Lynda Grier.*

Lynda Grier



16th June 1955

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*Lynnda Frier.*

THE 66336.

BULLACETON,  
SALTWOOD,  
HYTHE, KENT.

18 June 1955.

Dear Professor Singer,

I have much pleasure  
in subscribing to the enclosed,  
and hope the appeal may  
be successful.

I hope you received my  
phone message to cancel our  
lunch engagement, which I  
was sorry not to be able to  
keep owing to the train  
movements at that time.

Yours sincerely

V. P. Kenton



16th June 1955

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V. P. Kitchin  
18 June 1955.

16th June 1955

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*L. H. Phillips*  
21 June 1955.



*With the Compliments of*

Professor C. H. Philips

These two paragraphs about Dr. Needham may  
be of use to you.

SCHOOL OF ORIENTAL AND AFRICAN STUDIES  
UNIVERSITY OF LONDON, W.C.1

MUSEUM 2023-4

Dr. Needham's combination of scientific experience and sinological knowledge equips him to examine the history of Chinese civilisation. There is no question of his ability to deal with Chinese materials. His years in China have given him a mastery of colloquial Chinese (now used in most modern writings), and his wide reading in literary Chinese makes him well able to handle classical sources. His work is held in high esteem by Sinologists both in and out of China. The Academia Sinica, of which he is a foreign member, has, for some time past, allowed one of its members to work in close collaboration with him in Cambridge. As leader of the British Scientific Mission to China during the war he came in touch with a large number of Chinese scientists, from many of whom he has been able to secure continuing aid and advice.

Dr. Needham has rare research energy, coupled with a remarkable capacity for the scientific organisation of research work. On no other terms would it have been possible for a single person to have undertaken a project on the scale of his "Science and Civilisation in China". The first volume of this has appeared. (The second is in page proof, and the third and fourth are complete in draft. Six volumes in all are proposed.) The general plan, and the first two volumes, are impressive. It has been very well received as a monumental work in the best sense of the word. A work on this scale especially when conceived and written with enthusiasm opens itself to criticism. Yet it is substantially objective. It can be said without exaggeration that "Science and Civilisation" opens a new era in our understanding of the culture of the Far East.

14. June, 1955.  
CHP/DWH



1, WETHERBY GARDENS,

KENSINGTON S.W. 5.

FRE. 2450.

June 23, 1953

Dear Professor Fingler,

I have copied, and  
return herewith, the appeal  
to the Muffield Trustees as  
repeated in your letter of  
June 21. I know of no work  
more worthy of support than  
Dr. Needham's Science and  
Civilization in China.

Yours sincerely

J. J. Roth

16th June 1955

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*J. I. Brak*



24 St. Andrews Rd.,  
Cambridge

18 June 1955

Dear Professor Singer

Thank you for the invitation to  
sign the appeal for assistance for  
Needham's book which I gladly do and  
return.

Yours sincerely,  
EJP Alleybank

16th June 1955

The first volume of Science & Civilization in China by Dr. Joseph Needham, F.R.S., was published eight months ago. Volume II will appear this year. Volumes III and IV are well advanced, and Volumes V - VII are planned and will complete the work. We need not stress the significance for social science of these historical aspects of the only continuous and unified civilization with which those of the Near East and Europe can be reasonably compared. Dr. Needham's project is one of the most important in the whole range of humanistic and social studies that is before the learned world.

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*E. G. Pulleyblank*



June 15 1951  
Chandos Lodge,  
Eye,  
Suffolk.

Dear Mr. Singer

I have sent back the  
append duly signed. It occurs  
to me that, for the purpose it  
is to serve, I should have dated  
myself as:

LL.D. & Emeritus Professor of Columbia University  
New York, and former Director of  
The East Asian Institute there.

Member of the Academy of Japan.

Associate Fellow of Berkeley College, Yale.

Yours sincerely

Lege Sammons

*Wishing You A Merry Christmas  
and  
A Happy and Prosperous New Year  
— 1949 - 50 —*

*From  
Dr. & Mrs. Wu Lien-teh  
& Family  
12, Brewster Road,  
Ipoh, Malaya.*

恭  
賀  
新  
禧

伍  
連  
德  
博  
士

馬來亞怡保坡士打律十二號



29th September, 1958.

My dear Joseph,

How are you and when are we going to see you?

As one Dickinson Lecturer to another, I thought you might care to glance at my funeral oration for it is nothing else.

Love from us both to you both,

Yours affectionately,

CHARLES SINGER.

Dr. Joseph Needham,  
1, Owlstone Road,  
Cambridge.

23rd October, 1958.

My dear Joseph,

We should so like to hear your Wilkins Lecture but we cannot possibly get up to London on the 6th November. I do wish we could because, in fact, we have to be there on the 12th when the last volume of A History of Technology is published.

When are we going to have a visit from you? We do miss you so much.

I am just correcting the proofs of the Elementary History of Scientific Ideas, which is the new name for a metamorphosis of the Short History of Science now enlarged and almost unrecognisable, with Dingle's help.

Do let us hear from you.

Yours affectionately,

CHARLES SINGER.

Dr. Joseph Needham, F.R.S.,  
~~1,~~ Caius College,  
Cambridge.



5th January, 1959.

My dear Joseph,

First of all a Happy 1959 to you both.

Next, thank you very much indeed for the signed copy of Iron and Steel Technology in China which we treasure greatly. I would not write to you until I had made some figure at reading it and I enjoyed it thoroughly. You really are a wonderful man and the material that you have dug out for this one lecture would have occupied an ordinary scholar's lifetime. It is a very fine volume indeed. As it happened, I had fairly recently reviewed Schubert's book on Iron and Steel in Britain for the Journal of the Iron and Steel Industry. How very different its history is to that of China. It really is marvellous that the Far East was so many centuries ahead of the West and it has made me wonder more and more why the scientific idea did not penetrate more deeply. I read, just before your lecture, G.P. Thompson's Strategy of Research which does, I think, explain more aspects of this question which has been puzzling you and me for a good many years.

When is the next volume of your great work to appear?

Why don't you both come down here and polish it off? We are longing to see you both again.

With affectionate regards to you both from us both and again many thanks,

Yours as ever,

CHARLES SINGER.

Dr. Joseph Needham,  
Caius College,  
Cambridge.

Needham

Dr. Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

My dear Charles,

It was a very great pleasure to get your letter of the 5th January. I had been feeling rather guilty for a long time past that I had not written you a letter, having received several on one thing and another from you. Now I felt rather overwhelmed by the much too kind terms in which you spoke about my work in your letter. I am so delighted to hear that you enjoyed the monograph on the Development of Iron and Steel Technology in China.

Another by-product monograph, that on the History of the Development of Clockwork in China and of the other civilizations before the 14th century, is now going through the Press and should appear any time during the coming two or three months. Equally ready to come out is the third volume (on Mathematics, Astronomy, etc.) of the main work.

Just over Christmas I have been quite enjoying doing something towards Volume 5 with my collaborator Ho Ping-Yü from Singapore. Although he is himself an astronomer and astro-physicist, he has been devoting most of his time with me to the history of Alchemy and medieval Chemistry in China. So now we are going to produce a series of papers for Ambix, Chymia, etc. One is on the apparatus used by the Chinese alchemists (much more full and clarified than anything so far written on the subject, I think). Another is on the theories of categories which the medieval alchemists had; a third concerns a book of the 5th century on methods of getting minerals into solution. They made a lot of use of dilute nitric acid, prepared by the action of acetic acid on nitrate. In the meantime, I am busy preparing Volume 4, Part I of the main book for Press and I hope to get the whole of that in by Easter.

As regards revisiting Kilmarth, there is nothing, of course, that Dophi and I would like more. Maybe it would be possible during the Easter vacation. Maybe later in the year. The past year, of course, was so much



occupied by my travels in Asia that we did not have much time to do anything European at all. As you know, I was in Ceylon for the first three months of the year working on the University Development Commission, the report of which is now practically ready to be submitted; and after that, passing through Malaya and Cambodia, I had nearly three months in China, making a great tour of some 12,000 miles in the country. I came back loaded with fresh material for the book, and there is no doubt that the whole expedition was abundantly worthwhile. On the way home, I had a delightful fortnight in Jaipur in Rajasthan finishing off the Ceylon work with my Indian colleague, who is Vice-Chancellor of the University there.

How is Dorothea, I wonder? I hope that her health, as well as your own, is in pretty good shape. We certainly look forward very much to seeing you both again.

Derek Price got back eventually to Princeton after a long visa wait. I suppose he will be there another year or two. I gather that he is seriously thinking of taking the post at Greenwich, which certainly does sound very attractive. The general situation here at Cambridge continues to be more depressing than ever as regards the History of Science. The whole subject seems to have come to an absolute standstill, and with the departure of Rupert Hall, I really don't know what will happen. There is a lot I should like to tell you about when we meet, but all I can say at the moment is that I can hardly imagine that things could be worse. Fortunately, it has the great advantage that I am not concerned and can have my time uninterrupted for getting the book finished. After all, that is the obvious primary aim of my existence, and if I can get that accomplished, or nearly accomplished, in the rest of my time, I shall consider myself extremely fortunate.

Dophi sends her best love and, of course, both of us the best possible wishes for the New Year.

Ever yours,

Joseph

P.S. I hope you will forgive me for my harping on Asia in reviewing "History of Technology" 3 & 4 in Cambridge Review. I made it absolutely clear that it is unique, indispensable and a great personal triumph!



18/4 /59

- 1) Present position of the work.
 

Vol.1	Introductory Orientations	already published	1954
2	History of Scientific Thought	-do-	1956
3	Maths, Astron. and Earth Sciences	coming May	1959
4	Physics and Physical Technol.		
	pt.1 Physics, Mechanical Engg.	now being revised for press	
	pt.2 Civil Engg., Hydraulics, Nautics	fully written	
5	Chemistry and Chemical Technol.		
	pt.1 Milit. Tech., Metall., Textiles	half written	
	pt.2 Chemistry, Alchemy, Mining, Salt		
6	Biology and Biological Technol.	isolated sections	
	including Medicine and Agriculture	only written, but	
7	Social and Economic Background	material fully pre-	
	(with combined glossaries etc.)	pared	
- 2) Sources of Funds. Importance of continuing to secure UK support. Undesirability of accepting support from either USA or China.
- 3) Great difficulty of getting collaborators. Academia Sinica would be pleased to help with salary, as it did with Wang Ching-Ning (who had always been one of their Research Associate Fellows), but suitable persons most hard to find. This was looked into last summer.
  - (a) Young men of classical training not now apt in western languages
  - (b) Very few of them also having interest in science, or knowledge
  - (c) No incentive to leave China, as opportunities so great there.
- 4) Thus very fortunate to have Lu Gwei-Djen and Ho Ping-Yü. Important at all costs to retain them, since the work can absolutely not be done at all without Chinese collaborators. She is pioneering for 6 and he for 5.
- 5) The present moment is one when it would be highly appropriate to ask ICI for substantial support. My first task, after finishing revising Vol.4 for press, is to do the gunpowder story in 5 pt.1. We then have the central chemical subjects before us (5 pt.2). But 6 also contains a great deal of chemistry, e.g. nutrition, fermentations, pharmacy, etc. If at any time, therefore, now is when they might reasonably be expected to be interested.
- 6) Ho Ping-Yü has proved unexpectedly successful and co-operative as a colleague. Originally trained as an astro-physicist, he is permanently Lecturer in Physics at the University of Malaya, Singapore. His work in research, however, has all been in the history of astronomy and of chemistry.
  - (a) In striking contrast to Wang Ching-Ning, he is highly methodical, reliable, and industrious, but also extremely intelligent, and wonderfully quick in tracing things in old Chinese texts.
  - (b) Though with much better knowledge of modern science, his classical Chinese is excellent.
  - (c) We know from experience that we can collaborate together in actual writing (three large draft parts are in the press; Ambix and Journ. Warburg Inst.) very satisfactorily and well.
 It is clear that his co-operation in Vol.5 will be essential.
- 7) Having had two sabbatical years, Ho Ping-Yü is legally, and feels morally, bound to return to his post. But he is as anxious to return to work with me as I am to have him back. The plan therefore is that he should be in Singapore for 1960 and 1961, then take leave of absence without pay for the following three years, 1962 - 1964. This will be exactly the time I would like to have him with me, as the work on Vol.4, and 5 pt. 1, will fully occupy me in the meantime.
- 8) Pay at the University of Malaya is unusually high, and Ho could not accept less, as he has three children and extensive family commitments in the support of other relatives. The total emolument for the three years in question, plus the double sea-passage for himself and his family, will amount to £ 9,600 approximately. (The emolument must be an average of £ 2,600 p.a.).



- 9) More than this must be allotted to this part of the scheme, however, as the University of Malaya might be within their rights in asking for the refund of half a year's present sabbatical allowance since Ho would not have served six years in Singapore after the conclusion of his sabbatical leave. A total sum of £ 12,000 would cover this possibility, and if not used in this way, would permit of use for incidental expenses of production (microfilms, photographic material, books, etc.)
- 10) During the past three years, Lu Gwei-Djen has been supported by the Wellcome Foundation. Would not the present time be a suitable one for transferring her support to ICI? I think it is quite probable that the Wellcome would continue the grant for her, but if ICI were to take over, it could all be part of one general quinquennial scheme, which could begin in the near future, when the Wellcome ends. The point here is that it is so much chemistry in the biological volume.
- 11) In either case the question of Lu Gwei-Djen's salary will have to be faced in view of that necessary for Ho Ping-Yü. Although much more senior than he, she has so far since coming to Cambridge been receiving only £ 800 p.a. The contrast is all the more striking with the salary which she received during the nine years of her service in UNESCO, and her work with me in Cambridge must be recognised as done at considerable financial sacrifice. Ought we not now to ask for £ 1,000 or £ 1,200, so as to make it more comparable with Ho's? Of course she has no family commitments.
- 12) If it should be thought desirable, I would be willing to suggest to ICI that they might regard part of the grant as a loan, repayable by a portion of the royalties on Vols. 5 and 6. C.U.P. would certainly have no objection to this.
- 13) The total amount which I should thus like to apply for for the coming quinquennium would be £ 12,000 plus £ 6,000, i.e. £ 18,000 in all, for both persons and for both volumes.
- 14) In support of the appeal I would furnish the ICI with copies of the first three published volumes, and copies of by-product monographs (iron and steel technology, and clockwork), as also copies of joint publications with both Ho Ping-Yü (apparatus of the ancient and mediaeval Chinese alchemists, theories of categories in Chinese mediaeval chemistry, early tractates on bringing minerals into solution with dilute nitric acid, etc. etc.), and Lu Gwei-Djen (hygiene and preventive medicine in ancient and mediaeval China).



PROSPECTUS

# HEAVENLY CLOCKWORK

THE GREAT ASTRONOMICAL CLOCKS OF  
MEDIAEVAL CHINA  
A MISSING LINK IN HOROLOGICAL HISTORY

BY

JOSEPH NEEDHAM, F.R.S.

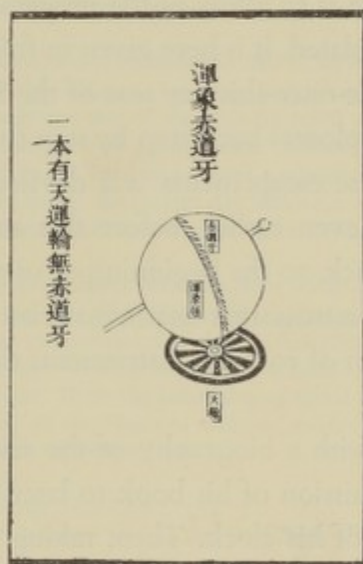
*Fellow of Gonville and Caius College, Cambridge  
Foreign Member of Academia Sinica*

WANG LING, Ph.D.

*Associate Research Fellow of Academia Sinica  
Trinity College, Cambridge*

DEREK J. PRICE, Ph.D.

*Christ's College, Cambridge  
Consultant in Astronomy and Engineering,  
Smithsonian Institution, Washington*



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CAMBRIDGE UNIVERSITY PRESS



THE INVENTION of the mechanical clock was one of the most important turning-points in the history of science and technology—indeed of all human culture. The problem was to find a way of slowing down the rotation of a set of wheels so that it would keep step with the great clock of the skies, that apparent diurnal rotation of the heavens which star-clerks and astronomers had studied since the beginning of civilisation.

In the course of a general survey of engineering in old China, Dr Needham and Dr Wang stumbled upon material which, with the fruitful collaboration of a historian of astronomical instruments, Dr Price, revealed six centuries of mechanical clockwork preceding the first mechanical escapement clocks of the West of about A.D. 1300. These Chinese clocks were powered, however, not by a falling weight but by a water-wheel. Yet they contained what has been called 'the soul of the mechanical clock', namely a form of *escapement*. This was a device of link-work and weigh-bridges which prevented the onward motion of the driving-wheel while each scoop filled in turn. In mediaeval China, machines of this kind were chiefly used to drive astronomical spheres and globes, the time being told by puppets and jacks beating upon drums and gongs or bearing placards to note the hour.

A description of an elaborate clock of this kind written in A.D. 1090 by a statesman who was also a scientist, throws abundant light on the technique of the time, and proved to be so complete as to allow of the preparation of detailed working drawings. Never before translated, it is here given in full. The evidence of earlier writings, only comprehensible once this key text of the Sung dynasty was understood, then took the three explorers back step by step to the year A.D. 725, in the T'ang, when the first of these escapements was devised—by a Buddhist monk and a military official. But even earlier, before this ancestor of all mechanical clocks, the trail led further back, to the beginning of our era, when in the second century A.D. an outstanding astronomer-mathematician of the Han dynasty applied his mind to the problem of rotating instruments slowly and steadily by the power of falling water.

The present work opens with a biography of the scientist-statesman of 1090, and an account of the transmission of his book to later times. There follows the description and explanation of his clock. Then, taking this as a focal point, the authors tell first the story of the clocks and 'proto-clocks' before his time, returning



## BIOGRAPHY OF SU SUNG

calendar was correct. Of course, Su Sung was unable to accept it,<sup>1</sup> but he calmly engaged in wide-ranging discussions on calendrical science, quoting many authorities, which puzzled the (Liao) barbarian (astronomers)<sup>2</sup> who all listened with surprise and appreciation. Finally he said that after all, the discrepancy was a small matter, for a difference of only a quarter of an hour would make a difference of one day if the solstice occurred around midnight, and that is considered much only because of convention.<sup>3</sup> The (Liao) barbarian (astronomers) had no answer to this, so he was allowed to carry out his mission (on the earlier of the two days). But when he returned home, he reported to the emperor Shen Tsung [951], who was very pleased at his success and at once asked which of the two calendars was right. Su Sung told him the truth, with the result that the officials of the Astronomical Bureau were all punished and fined.<sup>4</sup>

At the beginning of the Yuan-Yu reign-period (A.D. 1086) the emperor ordered Su Sung to reconstruct the armillary (clock) [150], and it exceeded by far all previous instruments in elaboration. A summary of data concerning it was handed down to Yuan Wei-Chi [456], Director of Astronomical Observations (Northern Region) [924]. The original model was due to Han Kung-Lien [457]<sup>5</sup>, a first-class clerk in the Ministry of Personnel, who was a very ingenious man. By that time Su Sung had become Vice-President<sup>6</sup> (of the Chancellery Secretariat) and simply gave the ideas to him. He could always carry them out, so that the instrument was wonderfully elaborate and precise. When the (Chin) barbarians took the capital they destroyed the Observatory (or Astronomical Clock Tower) [117] and took away with them the armillary (clock) [150]. Now it is said that the design is no longer known, even to the descendants of Su Sung himself.

*Shih-Lin Yen Yü*, ch. 3, p. 14*b* by YEH MÊNG-TÊ, c. A.D. 1130

The calendar of the Ch'i-tan (Liao) people was different by one day from that of our own dynasty (the Sung). In the Hsi-Ning reign-period (A.D. 1068-77)<sup>7</sup> Su Tzu-Jung [451], (Su

<sup>1</sup> As a high official of the Sung dynasty, he naturally had to adhere to the Sung calendar.

<sup>2</sup> These men were of course also Chinese, but they had taken service with the northern 'barbarian' dynasty, the ruling house of which was that of the Ch'i-tan tribal people.

<sup>3</sup> Cf. Maspero (1), p. 258. Owing to an interpolation method then used for plotting the variation of gnomon shadow lengths, Ho Ch'êng-T'ien [505] missed a solstice in A.D. 436 because it occurred half-an-hour before midnight; but in 440 he got the correct day because it occurred three hours after midnight. To appreciate Su Sung's point one must remember that the quarter was the smallest time division in common non-astronomical use.

<sup>4</sup> In view of what is here suggested about the superiority of the astronomers serving the Liao dynasty in the north it is interesting that the *Liao Shih* [809] (ch. 44, pp. 39*a*, *b*) has extremely little to say about armillary spheres (and nothing about astronomical clocks); indeed it indicates that the Ch'i-tan people never had any at all. It does however say: "For firmness there is nothing better than metal, and for use there is nothing more profitable than water. With the fashioning of metal and the flowing of water one can know the Tao (i.e. the way and order) of the Heavens without stirring outside one's house". There is also a reference to the astronomical clock of I-Hsing (see p. ), so no doubt they knew something of that. Cf. Wittfogel & Fêng (1), p. 467.

<sup>5</sup> The text mistakenly says Chang Shih-Lien [458].

<sup>6</sup> Or Principle Executive Officer.

<sup>7</sup> In A.D. 1126. This statement is found also in the *Sung Shih*, ch. 48, p. 18*a*. The Chin people (Jurchen Tartars) took away not only the clock of Su Sung, as we shall see fully later (p. ), but also all the five astronomical clocks proposed in the Hsüan-Ho reign-period (A.D. 1119-25) which were then under construction. Cf. the passage translated from the *Chin Shih* [810], p. below.



later to recount those subsequent developments the last of which was the coming of the Jesuits with their gifts of time-pieces from Renaissance Europe. These chapters contain many texts now translated for the first time into any Western language. Finally there is a discussion of the social context of the Chinese inventions and an assessment of the possibility that some of them were transmitted to mediaeval Europe. The work is fully illustrated with pictures from the old Chinese books and comparative material from Islam and Christendom. A modern artist's reconstruction of the great Sung clock-tower has been specially prepared. In order to give the book its full value for research, Chinese characters are included in the glossaries of names and technical terms which follow the bibliography.

The discoveries of Dr Needham, Dr Wang and Dr Price are about as exciting as any which can be made in the history of science and technology. For until now there was no clear continuity between the ancient clepsydra water-clocks, depending purely on drip and floats, and the mechanical clocks of the modern world. But the combination of water-power with an escapement now reveals a form of time-keeping apparatus which is truly a missing link, and connects together in an unbroken sequence the earliest leaking pots of Babylonia and Egypt with the watches and chronometers which we use today. Thus the book records a veritable treasure-trove of ancient thought and practice in horological engineering.

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7th May, 1959.

My dear Joseph,

Many thanks for your letter of May 4th and for the advance page proof copy of Vol. III which arrived yesterday. We are very proud to possess it and proud too of the charming compliment in the preface. You both know well that you are always more than welcome at Kilmarth and that it is always a pleasure to us to have you here.

I think that you were right to write direct to Worboys. The letter is a good one and may ease my path if any opportunity to discuss such matters arises. I just do not know what form the meeting or reunion is to take, nor even who, except Worboys, will be there. Worboys himself is a civilised man, trained as a chemist at Oxford and has been the stand-by for the History of Technology throughout. I can be relied on to do anything that comes within my power.

We were greatly amused at reading our Chinese names and that of the Kilmarth Library.

I would write at greater length but we are at work packing up, a more extensive affair than you would think as we are moving into a very bare flat in London.

My Short History of Science is finished to the last stroke but labour troubles are threatened at the Oxford Press. It is promised for next month but may be delayed. I do hope the trouble will not spread to Cambridge and affect Science and

P.T.O.



Civilisation in China.

Our London address as from next Monday will be :-

50, Cottesmore Court,  
London, W. 8.

Tel. No. Western 8347.

With kindest wishes from both to both,

Yours affectionately,

CHARLES SINGER.

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
CAMBRIDGE.



Western 8347

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50, Cottesmore Court,  
London, W. 8.

25th May, 1959.

My dear Joseph,

The lunch at I.C.I. went off very well. It really was a sort of lunch to me.

The people present were Fleck, the Chairman, Worboys, the Commercial Director, Cronshaw, ex-Director who was the real initiator of the History of Technology, the secretary of the Clarendon Press and his first assistant, Wood, Trevor Williams and myself.

Your letter was not mentioned and the opportunity really didn't arise to mention it. I thought it best to be silent on the subject. Nevertheless there was a generally friendly attitude to a History of Technology and, what is of most importance, a recognition that there is a demand for books on the subject. The sales, for the five volume History have been quite excellent. No volume has sold for less than 3,000 copies which does not include the special cheap edition, on rather inferior paper and slightly reduced in size, which is being produced by some photographic method in America. I understand that at least 1500 copies have been printed there. Furthermore, the secretary of the Clarendon Press says that, so far as he can see, the existence of this cheaper edition has not in the least affected the American sales of the proper edition.

The balance sheet is, I think, that I.C.I. can reasonably expect to get its money back in quite a short time. From the most vulgar point of view this means that these volumes have been a very good and cheap advertisement. In effect, it means that they are going to try to do more of the sort. I don't think I can say more than that at the moment.

The meeting at the Imperial College of Science went off also very well though it happened that I had a

P.T.O.



rather tiresome cough at the time which was rather annoying. I took the standpoint which you well know and, furthermore, that the history of science was part of the organon of learning. Therefore any great university must establish a department of it, quite apart from any question of the number of students. This view was carried with acclaim and with complete assent from everybody.

I cannot tell you who all the people were at the Imperial College of Science dinner but they included Sir Reginald Linstead, the Rector, Patrick Blackett, Ubbelohde, Whitrow, A.R.Hall, McKie and several other professors at the Imperial College, whose names escape me. I think there is no doubt that they are going to institute a new department. It will contain one professor and perhaps two. My suggestion was that there should be a professor of the History of Science which would cover the area up to this century and another professor who would be, in effect, a professor of the Philosophy of Science, who would cover the modern approach to the universe. I think there would also be an assistant. Of course none of this is official and it is simply the opinion of the most influential members of the staff at Imperial College but I think things are beginning to move now.

Hall made some effort to bring the question down to the suitability of the subject to the Imperial College and especially whether they would get students there. Ubbelohde, Blackett and I took it well away from that point of view to the fact that the subject was worth pursuing in its own right. This carried the day and I think is well in the minds of the College.

There is in to-day's Times an article 'Universities in mortal peril' by Mansell Jones. He has got some idea of what I have been putting across at Imperial College but he is an extremely obscure writer and some of his points are really so badly expressed that they are unintelligible. If you will



25th May, 1959.

- 3 -

look at the first sentence in the last column of p. 11 you will see what I mean. Where he has introduced the word 'procedure' he really means 'production'. Altogether a good idea extremely badly expressed. I am thinking of following it up with a letter myself if I can summon up energy for it but it means, of course, a day's work.

We have a most comfortable flat here where we remain until the 24th June.

With love to you both from us both,

Yours affectionately,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
Cambridge.



6th August, 1959.

My dear Joseph,

It is a bad business about Cambridge not appointing to the post for the History of Science anyone who has any achievement in that direction to his credit. I have had several letters and one telephonic communication from Derek Price who takes the matter very hardly. I think this is quite natural and I entirely agree with him. I had hoped to get him back to England and there is still the possibility - indeed almost the certainty - that the Imperial College of Science will establish a chair of the subject. These things move so frightfully slowly in academic matters and there is no hope of hastening them. Even if the unexpected were to happen and someone were to offer a thumping sum for the purpose it would mean endless committees. I have, in fact, written to Fleck suggesting that I.C.I. should support such a scheme. He only has a few more months to run as a Chairman but he would, I think, be thoroughly in favour of it. His difficulties are probably the same as ours.

I can remember that when I had been approached by I.C.I. to suggest a plan for a work and it submitted the plan which was substantially that of the History of Technology, it took six months before they really made a specific offer. Where a commercial firm takes six months a university would take at least six years. My own poor little Short History of Scientific Ideas was quite ready a year ago. They put off the last stages of printing time after time but they did get it out before the strike, and when the strike took place they promised publication on September 2nd. I received a bound copy two months ago with the promise that it would be published late in June; then the strike and they then promised early in September. This morning I get a letter to say it will probably be

P.T.O.



"sometime in October" When is your third volume to make its formal bow? I suppose that also has been delayed by the strike.

I am really very worried indeed about Price and don't know what to say to him. Of course he will get that job at Yale and then everyone will say why on earth didn't they offer him a post in England. He wrote to me that you and I were the only two who had taken any notice of the event. Really too bad.

Let us hear that all goes well with you both.

Yours affectionately,

CHARLES SINGER.

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
CAMBRIDGE.



2nd November, 1959.

My dear Joseph,

First of all I cannot tell you what a pleasure it is to see you getting through your great book. It really is a wonderful thing to have it and to be able to compare the two civilisations of the world. To me it seems, as it always has seemed, by far and away the most important literary enterprise of our age. I look forward to seeing its completion. No one realises more than I the immense amount of learning, work and applied genius that it has meant. All good wishes to you both.

Compared to this great work, it is coming down to earth to congratulate you on being President of Caius. I hope it doesn't mean more work and I hope it does mean more pay. Your position, however, is now so triumphantly secure that no one can question it.

We look forward to the time when we shall see you at Kilmarth again. I may say this letter is written on my 83rd birthday. We are, however, both of us surprisingly well. Had our fairy godmother asked us where we would like to spend the last twelve months from the point of view of climate, I don't think we could have chosen as fortunately as we have done.

I think my chief anxiety in life is the rate at which first class men are going to America. I fear that we shall lose Derek Price irretrievably. My view is that we cannot help the fact that England

P.T.O.

has a quarter of the association and perhaps a tenth of the wealth of the United States, but we ought nevertheless to be able to keep our best men and we are not doing so. However, owing to a variety of circumstances, I don't think there is much chance of losing Joseph and Dorothy Needham.

With our joint love to you both,

Yours affectionately,

CHARLES SINGER.

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
Cambridge.



2nd December, 1959.

My dear Joseph,

I cannot tell you what pleasure the review of your work by Pulleybank gave me. I never had any doubt at all that your great enterprise was the leading achievement in the humanistic field - if that correctly describes it - of our time. I don't believe that the review gave you more pleasure than it gave to me.

I do hope that your new post is relieving you of teaching burdens and that it is giving you full leisure. I suppose that it must mean that you get far more accommodation in College for your library. Do let us know when Dophi and you are coming down to rest yourselves here. You well know that you have only to give us a date.

We are altogether more comfortable here than we were. Our central heating is now by oil and is much more efficient. We have had the lift electrified and we have a very efficient house couple to look after us in addition to Abbie.

With affectionate greetings from us both to you both,

Yours ever,

CHARLES SINGER.

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
Cambridge.



15th December, 1959.

My dear Joseph,

I am just engaged in going through your Vol. III and, at the same time, through the Royal Society volume of the Letters of Newton. I am moved to write to you that I feel that by these two the study of the history of science in Britain has been raised to a new level that amounts to a new universe of discourse. 1959 will be regarded by historiographers as a vintage year. I know nothing to compare to the importance of these two volumes in giving a new outlook on the relations of men to each other. I heartily and affectionately congratulate you.

It is not possible for any man to 'review' either of these volumes in any proper sense. I have been asked to review both and I have explained that both are quite beyond my powers. I stand before them in admiration and of course I can try to describe them. I should like to recommend someone who could review them but there is no such person. I hope, therefore, that editors will take my advice and inform readers that something important has happened in literature and learning of which these are the portents. They are both destined to become national monuments.

While these things have been happening in England, there have certainly been some significant, but hardly comparable, developments in the United States. They are not of this order but they do involve the attention of many younger minds. That, from the English point of view, is the seriousness of the situation. You know as well as I that many of our promising younger men are leaving for U.S.A.

P.T.O.



- 2 -

What they will achieve there no one will know for  
at least twenty years. But I do not believe that  
they will produce monuments such as those before me.

With all good wishes from us both to you  
both,

Yours always in admiration and affection,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.,  
Caius College,  
CAMBRIDGE.



Gonville & Caius College, Cambridge

5th January, 1960

tel. 3275

Dr Charles Singer,  
Kilmarth,  
Par,  
Cornwall.

JN/MW

My dear Charles,

I have to thank you warmly for your embarrassingly kind letters of 2nd and 15th December. It was a very nice review of Volume 3 by Pulleyblank in The Listener but there has also been a good one by Eberhard in the Far Eastern Quarterly. He does not waste any compliments but he gives a very understanding description of our research methods, the comparative study of Indian and Arabic culture, etc., etc. Of course it will take a very long time before many reviews come of such a large volume and no doubt what you say about the difficulty of reviewing such books is quite true. I am extremely happy however that you have been asked to do a review and I shall greatly look forward to its appearance and any valuable criticisms which you may have to make.

I must explain a little more about what you call my 'new post'. It isn't a post and it doesn't involve living in any special Lodge in the College. With us, 'President' simply means 'Vice-Master'; one has to take the Chair in Hall every night when the Master is not present and one has to deputise for him at meetings of the Council or other Committees if by any chance he cannot be present. The only serious burden which would fall upon the holder of the office of President is if anything should happen to the Master, but fortunately we only elected our new one, Neville Mott, the physicist, a year ago and he is, I rejoice to say, extremely fit and capable and in good health and altogether an excellent choice. However, in general the election to the Presidency is an extremely nice thing to happen to anyone and all the more delightful in that it is a sign of honour and appreciation given by the colleagues of one's immediate environment; contrary in a way to the old adage about prophets not being honoured in their own country.

I agree with all that you say about the shocking effect of our young historians of science leaving for the United States. It worries me very much but there is nothing that I can do about it. I was amused to see the other day in the National Geographic Magazine a colour picture of Derek Price examining historical scientific instruments at the Institute of Advanced Studies at Princeton in New Jersey.

We are also very happy to know that your central heating is going well and that you have an electrical lift and everything well arranged in the house. Of course we look forward very much to coming to Kilmarth again and perhaps at Easter would be quite a possibility. I shall get Dophi to write before long.



You may remember that I went ahead with my application for funds from Imperial Chemical Industries. I am afraid that this has not gone very well and it is still pending. Sir Walter Worboys was keen enough but he has now, as you know, retired and he has handed it over to others who seemingly will not even answer my letters. However I am keeping on trying and if they in the end decline to help I shall continue seeking assistance from other Foundations. I am quite determined to get Ho Ping-Yü back to work with me from Singapore and as I have previously explained this will cost a lot of money because salaries are so high at the University of Malaya. I am hoping to get some help from Malaya also and indeed I did receive a very sizeable cheque some time ago from one of the wealthy rubber merchants in Singapore. Well, we shall see what happens.

With affectionate greetings and best wishes for many happy returns of the New Year and all success in 1960 to both from both,

Ever yours,

Joseph

1 Owlstone Road, Cambridge

24th. Jan. 1960

tel. 2183

My Dear Charles:

Very many thanks for your kind and hand-written letter of the 7th. I did not reply as I was waiting for developments. Now the new ~~Chairman~~ <sup>Deputy-</sup> of ICI has at last taken action, and I am to lunch with him and some of his appeals committee colleagues on Thursday the 4th. Feb. This is Holroyd - he said he had been overwhelmed with work and overseas.

Worboys has retired. He wrote to tell me so on the 28th. October last, and said he was handing over my appeal to Holroyd.

Since speaking with the latter on the telephone, I have sent him the letter a copy of which I enclose herewith. This seems to me calculated to convince anyone who was at all open to conviction. You will notice that I signed as President.

Thanks for your suggestion about an Endeavour article. I could do one without any difficulty on Chinese angles on the general history of distillation, but with such a subject coloured illustrations would be almost impossible. How important do you really think they are ?

With love to Dorothea as well as yourself,  
Ever yours,

Joseph



Copy

Caius College, Cambridge.

25th January, 1960

Dr Ronald Holroyd,  
Imperial Chemical House,  
Millbank, London SW 1

JN/tm

Dear Dr Holroyd:

This is just to confirm our arrangement on the telephone a few days ago that I am to lunch with you and some colleagues at Imperial Chemical House on Thursday the 4th February. I shall look forward very much to this.

I have been thinking over what you said about the history of science and technology in the Chinese culture-area as being perhaps "too specialised" a subject for support by Imperial Chemical Industries. After all, there are only three really great continuous and still existing civilisations in world history - the Western, the Chinese and the Indian. We have now acquired a good deal of knowledge about the development of science and technology in our own civilisation, but we still know very little about the parallel evolution of the other two. Yet the world culture which is coming into being today will inevitably be built on all of them.

Moreover, I have ventured to ask for support from Imperial Chemical Industries only for the volume which will deal with the history of chemistry and chemical technology. The three volumes already published were placed at the disposition of Sir Walter Worboys last year. But it has occurred to me that it might help our discussion if you and your colleagues had had an opportunity to look at some of the draft sections of the chemical volume which are now being published in preliminary form. I am glad therefore to be able to send you herewith four such sections (all prepared, as you will notice, with the collaboration of Dr Ho Ping-Yü).

The first of these deals more thoroughly than has ever been done hitherto with the actual apparatus and equipment used by the Chinese alchemists and pharmaceutical chemists of the Middle Ages (+1st to 14th centuries). The results of this enquiry demonstrate once again how much of the basic elements of chemical technique go back to these times.

The second translates and discusses a +6th-century text concerning the early empirical use of mineral acids in China. It is fairly clear that the recognition of potassium nitrate and the knowledge of its preparation and purification was the limiting factor for two fundamental advances in post-+13th-century Europe - the manufacture of gunpowder, and of the first mineral acid, nitric. Thus the establishment of the existence of a knowledge of saltpetre in



East Asia in the +5th century (perhaps indeed as far back as the -4th century), is of great importance for the history of inter-cultural influences.

The third section deals with a Chinese tractate of the +7th or +8th century on alchemical theory. This is particularly interesting because it enables us to trace the early history, both in East and West, of certain chemical ideas which have been of great significance even in relatively modern times, i.e. that "like only reacts with like", and conversely that "substances react only with their opposites". This text is for its date remarkably sophisticated. It recognises truth in both these propositions, and attempts a classification of substances based on this view.

Finally, the fourth deals with the perennial search for elixirs of longevity in mediaeval China, and explains the philosophical reasons why alchemy there was in all ages what it only became at the Renaissance in the West, iatro-chemistry. In other words, the Chinese always believed, like Paracelsus (but long before him) that "the business of alchemy is not to make gold, but to make medicines".

I hope that these remarks will go some way to show that the history of chemistry in particular (as of science in general) in ancient and mediaeval China, is not something very specialised, appealing only to orientalists buried in old university libraries and pursuing abstruse researches with no students to teach. On the contrary, it constitutes an important and vital chapter of the history of mankind, of human knowledge of Nature and control over her in the chemical field. To give only one instance, you will find in the second section an account of the widespread industrial manufacture of copper by the wet method in +11th-century China, i.e. by the precipitation of copper from copper-rich mine waters by treatment with iron scrap. The subject for which I am appealing is therefore of very general interest to all curious readers whether trained in the sciences or in the humanities.

Besides these papers, I send you also in another packet some reprints which I do not need to have back, and which illuminate other aspects of our work in progress.

With best wishes,

Yours sincerely,

*Joseph Needham*

President of Caius College.



27th January, 1960.

My dear Joseph,

Many thanks for your letter of the 24th January and the copy of your letter to Holroyd.

You will find they will give you an extraordinarily good lunch at which it is extremely important not to take any alcohol! That is, of course, just what they want.

I met Holroyd two or three times. He is obviously a man of great ability but one very much with his feet on the ground; of the old type of 19th century scientist and very different from Worboys who is intellectual and artistic though not in the least starry-eyed. I am very sorry that Worboys has gone. He would make an extraordinarily good professor and I should think not too old. If only you could get him to Cambridge he would work wonders but that is too good to be possible.

You will doubtless meet Trevor Williams at the lunch party and he has probably been deputed to go over your material for Holroyd and Co. He is a very able man and, perhaps, more idealistic than you would think. He really has done Endeavour very well - I think better than Holmyard - but of course he had Holmyard's results to work upon.

I don't think it is important for you to have an article in Endeavour though it would help somewhat. It is perhaps a little too late

P.T.O.



and it is beneath your dignity to offer one. They will want it in time all right, especially after Williams has read your material. I am quite sure that you will find them all very friendly else they would not have invited you, but I think Williams is worth cultivating because he is the kind of man who might one day be a director though not yet awhile of course. I daresay you will remember that we have to make friends with the mammon of unrighteousness.

I reviewed in the Spectator the other day your third volume - that is, if you can call a review a notice of a paragraph or two on such a work. I called it a national monument, which is what it is, and bracketed with the Newton Letters. Doubtless the C.U.P. have sent you a copy.

I am revising my Short History of Scientific Ideas - which is a mere schoolbook - and putting in a few paragraphs on China.

I am very hopeful about I.C.I. taking your matter on because they are beginning with you exactly as they began with me. At least you can be sure that they will not do less than they promise but I don't believe there is a group as favourable to humanistic knowledge in I.C.I. as there was in my time. Ayers, Worboys and Cronshaw were a splendid trio.

Of course there is no hope of getting you down here after your lunch at I.C.I. but if there is do let us know. Otherwise there is nothing in this letter to answer.

I am trying to prepare a comparison of the teaching of the history and philosophy of science in this country and America, obviously to the disadvantage of this country. Any hints or information you can give me on that point would be most welcome.

Love to you both from us both,  
Yours affectionately,  
Dr. Needham, CHARLES SINGER.



25th March, 1960.

My dear Joseph,

Many thanks for your letter of March 23rd. I need hardly say that I am proud to be remembered among the 'Friends of the Project'. I have written to that effect to Victor Purcell.

I am glad you liked what I said about the work in the Spectator. I am, of course, quite incapable of reviewing it but I can treat it with the utmost respect. How wonderful for you to have got Vol. 4 A to press.

We are greatly looking forward to having you with us.

With affectionate good wishes to you both from us both,

Yours as ever,

CHARLES SINGER

Dr. Joseph Needham, F.R.S.,  
1, Owlstone Road,  
CAMBRIDGE.

25th March, 1960.

Dear Dr. Purcell,

Thank you for your letter with reference to the 'Friends of the Project' of Dr. Needham's Science and Civilisation in China. I am, of course, delighted for you to add my name and would now, as always, do all in my power to forward this magnificent undertaking which has my very fullest sympathy. I regard it, and always have regarded it, as one of the greatest undertakings of the kind of our time.

Yours sincerely,

CHARLES SINGER

Dr. Victor Purcell, C.M.G., etc.,  
10, Lyndewode Road,  
CAMBRIDGE.



Gonville & Caius College, Cambridge

23rd March 1960

tel. 3275 ext. 47

My Dear Charles :

I am sure I can count on you to form one of the distinguished committee we are trying to assemble to help the finance of S & C i/c. May I take this opportunity also of thanking you for your so kind words about Vol. 3 in the Spectator. Vol. 4 A is going to press tomorrow. We look forward to seeing you soon before Easter.

With love to Dorothea, Yrs Joseph

UNIVERSITY COMBINATION ROOM

*The Old Schools, Cambridge*



PLEASE REPLY TO

VICTOR PURCELL, C.M.G., Litt.D.  
10 Lyndewode Road,  
Cambridge.

*Dear Dr Singer,*

I am writing to ask you if you would be willing to give your moral support to Dr Joseph Needham's work in course of publication, 'Science and Civilisation in China', by joining a 'Friends of the Project' committee. The financing of the research and preparative work required for these volumes has long been a great burden on the author, and if the whole project is to be brought to completion in his lifetime it is desirable that a group of friends and well-wishers should now place themselves in a position to initiate appeals to benevolent foundations, industrial organisations, and other sources of support.

As you will know already, the plan of a series of comprehensive volumes on the history of science, scientific thought, and technology in the Chinese culture-area was initiated before the second world war, during which Dr Needham's residence in China gave him exceptional opportunities for acquiring an orientation in the vast literature relevant to the enterprise. The value of the project is now generally recognised. World history knows only three really



great ancient, continuous, and still existing civilisations, the Western, the Indian, and the Chinese. Since science, pure and applied, is one of the greatest unifying factors in the modern world as well as one of the most important of human achievements, the study of its history is indispensable. Yet while we now know a good deal of the history of science and technology in our own civilisation, we still have little information about the parallel evolution of the other two, though the world community of the future will inevitably be built on all of them. Dr Needham's book has been saluted as 'Perhaps the greatest single act of historical synthesis and intercultural communication ever attempted by one man'.

Problems of fascinating interest emerge. Why did the rise of modern (as opposed to ancient and medieval) science occur only in Europe, being inhibited in India and China? How was it that in earlier centuries science attained higher levels in Chinese civilisation and was applied much more effectively than in the West to practical uses? The first question was the original mainspring of the project, the second only presented itself as the facts came to light in the course of these researches.

Of 'Science and Civilisation in China' three volumes have now appeared, and the first part of the fourth has just gone to press. Volume I (1954) consisted of Introductory Orientations and Volume II (1956) dealt with the History of Thought in China as it affected the growth of scientific ideas. With Volume III (1959) the true substance of the story was reached, for it gives a detailed survey of Mathematics, Astronomy, and the Sciences of the Earth in Chinese culture. The next three volumes (each in two or three parts) will deal successively with Physics and Physical

Technology (including all branches of Engineering), Chemistry and Chemical Technology (including Martial and Textile techniques) and Biology and Biological Technology (including Medicine, perhaps the hardest assignment of all, and Agriculture).

Lastly, the seventh volume will study the social and economic background of the Chinese sciences and crafts, while the work as a whole will end with unified bibliographies and indexes (each volume having been complete in itself), as well as a biographical glossary of Chinese scientific men and technicians in all ages, a register of technical terms, and other apparatus. Parts of all these future volumes have already been written or drafted, and the definitive text is complete down to the first half of Volume V. In addition, occasion sometimes arises for the publication of 'by-product' monographs, more detailed than the main work itself can be; two of these have already appeared, one on the development of the iron and steel industry in ancient and medieval China, unexpectedly advanced in comparison with Europe, and one on the invention of the mechanical clock in 8th century China, and its subsequent spread in East and West.

Although substantially the whole of the text of 'Science and Civilisation in China (comparable in scale with many well-known collective works) is from Dr Needham's own pen, it will readily be appreciated that such an undertaking would be quite impossible without the daily collaboration of Chinese scholars. No single mind could hope to combine into one range of expertise forms of knowledge so diverse as those of all the natural sciences, and of all branches of Chinese literature and history, more especially as no such task can be accomplished without awareness of parallel developments in the Hellenistic world, India



Between 1948 (when writing began) and 1956 Dr Needham had to spend about £3,500 from personal funds, being obliged to support his collaborator Dr Wang for some four years at his private charges. It is reckoned that the annual non-salary expenditure at the present stage of the project amounts to well over £1000. The problem of Dr Ho is still more serious because since Singapore University salaries are exceptionally high it will be necessary to find some £2,500 a year for at least three years besides the cost of air or sea travel both ways. Looking still further ahead, it will be essential to find and to pay a Chinese colleague well qualified in sociological studies for the needs of Volume VII. It is further relevant that to meet the wish of the Press in keeping down the price of the volumes Dr Needham renounces royalties on the first 500 copies of each one and on his own initiative ploughs back all royalties forthcoming into the general research fund. The Press itself, as a non-profit making concern, budgets, of course, only to recover expenses.

Besides the benefactions already mentioned, the project 'Science and Civilisation in China' has had support from a number of bodies, i.e. the British Council (1946-48), the Spalding Fund (1949-50), the Universities' China Committee (1950-58), the Leverhulme Foundation (1951-53), Caius College (1954-57), Academia Sinica (1955-58), and the Blue Funnel Line (Holt Family Trust) (1956-60). From the multiplicity of these organisations, none of which could afford to cover more than a fraction of the expenses, an idea can at once be gained of the labour involved in appeals perpetually renewed, labour which must seriously distract the attention of any scholar from his proper work. Support over a relatively extended period is enormously helpful for the leader of such a project, not only for its intrinsic value, but because it liberates him from

continually recurring financial anxiety and from endless new formulations of needs. The committee 'Friends of the Project' now to be formed, of which I have gladly consented to be Honorary Secretary, will be in a position to make appeals to specific foundations from time to time as required, and will have the additional advantage of being able to address them when necessary to a number of industrial organisations at one time which might like to contribute along with others in the same line of interest.

I sincerely hope, therefore, that you will let me know of your willingness to join this sustentation committee. I am writing in the same way to other well-wishers, a list of whose names will be found attached hereto.

Yours sincerely,  
Victor Purcell

Dr Charles Singer,  
Kilmarth,  
Par,  
Cornwall.



Sir Horace Seymour, G.C.M.G., C.V.O., Bratton House,  
Westbury, Wilts.

Sir George Sanson, G.B.E., K.C.M.G., 672 Foothill Road,  
Stanford, California, U.S.A.

Professor E. Pulleyblank, 114 Durnford Way, Arbury Road,  
Cambridge

Professor C.Y. Philips, Director, School of African and  
Oriental Studies, University of  
London W.C.1

Professor Nevill Mott, F.R.S., Master's Lodge,  
Gonville & Caius College, Cambridge

Dr Charles Singer, Kilmarth, Par, Cornwall

Dr Joseph Edwards, C.B.E., 5 Chester Close, London S.W.1

John Keswick Esq., C.M.G., 5 Chester Place, London N.W.1

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52 Queen Anne Street,  
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London, N.W.3

Professor William Bapson, Studio House, 1 Hampstead Hill  
Gardens, London, N.W.3

Professor H.R. Trevor-Roper, 8 St Aldate's, Oxford

The Right Hon. Earl Russell, O.M., F.R.S., Plas Penrhyn,  
Penrhyndeudraeth, Merioneth

The Right Hon. Lord Chorley, The Rockery, Stanmore, Middx.

Sir Cyril Hinshelwood, F.R.S., Royal Society, Burlington  
House, Piccadilly, London W.1

Rt. Rev. Ronald Hall, Bishop of Hongkong, Bishop's House,  
Hongkong.

The Right Hon. The Earl of Verulam, Gorhambury, St. Albans,  
Herts.

Col. Sir Malcolm Stoddart-Scott, O.B.E., M.P., Creskeld Hall  
Arthington, nr. Leeds.

Gerald d'Erlangen Esq., C.B.E., 11 Hyde Park Street,  
London W.2



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禧



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*Another Year (1951-1952) has come and the Wus Extend you  
and Your Family Their Best Wishes For  
A Very Merry Christmas  
and A Happy and Prosperous New Year*

伍伍  
連連  
伍伍德德  
玉玉夫博  
珍玲人士

*Dr. & Mrs. Wu Lien-teh*

*Betty Yulin*

*Ellen Yuchan*

伍伍伍  
玉長長  
珠員生

*Fred. Changsheng*

*John Changyun*

*Pearl Yuchu*

*12, Brewster Road, Ipoh, Malaya.*



To  
Charles Singer  
with affectionate greetings!  
from all of us  
(H)

Price

(Reprinted from *Nature*, Vol. 177, pp. 600-602, March 31, 1956)

## CHINESE ASTRONOMICAL CLOCKWORK

By DR. JOSEPH NEEDHAM, F.R.S.  
Caius College, Cambridge

WANG LING  
Trinity College, Cambridge

AND  
DR. DEREK J. PRICE  
Christ's College, Cambridge

IT is generally agreed that the invention of the mechanical clock was one of the most important turning-points in the history of science and technology. According to the view accepted until recently<sup>1-4</sup>, the problem of slowing down the rotation of a wheel to keep a constant speed continuously in time with the apparent diurnal rotation of the heavens was first solved in Europe in the early fourteenth century A.D. Trains of gearing were then combined with the verge and foliot escapement and powered by a falling weight. Recent research has shown, however, that these first mechanical time-keepers were not so much an innovation as has been supposed<sup>5</sup>. They descended, in fact, from a long series of complicated astronomical 'clocks', planetary models, mechanically-rotated star-maps and similar devices designed primarily for exhibition and demonstration rather than accurate time-keeping. Although such devices are of the greatest interest as the earliest complex scientific machines, it has not hitherto been possible to adduce more than a few fragmentary remains, and literary descriptions tantalizingly incomplete, which lack sufficient detail for clear understanding of the mechanical principles involved. But the examination of certain medieval Chinese texts, the relevance of which has not been realized, has now permitted us to establish the existence of a long tradition of astronomical clock-making in China between the seventh and the fourteenth centuries A.D.

The key text is the "Hsin I Hsiang Fa Yao" [New Design for a (Mechanized) Armillary (Sphere) and (Celestial) Globe], written by Su Sung in A.D. 1090, the appropriate sections of which we have fully translated. This describes in great detail an astronomical clock of large size (Figs. 1 and 2) powered not by a falling weight, but by a scoop-wheel using water



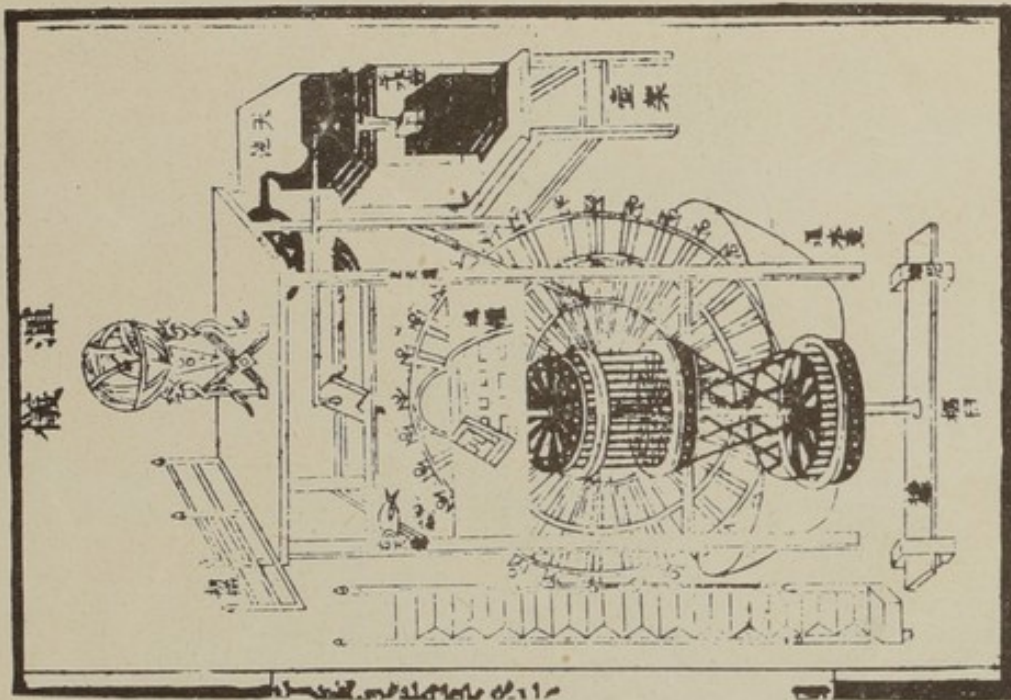
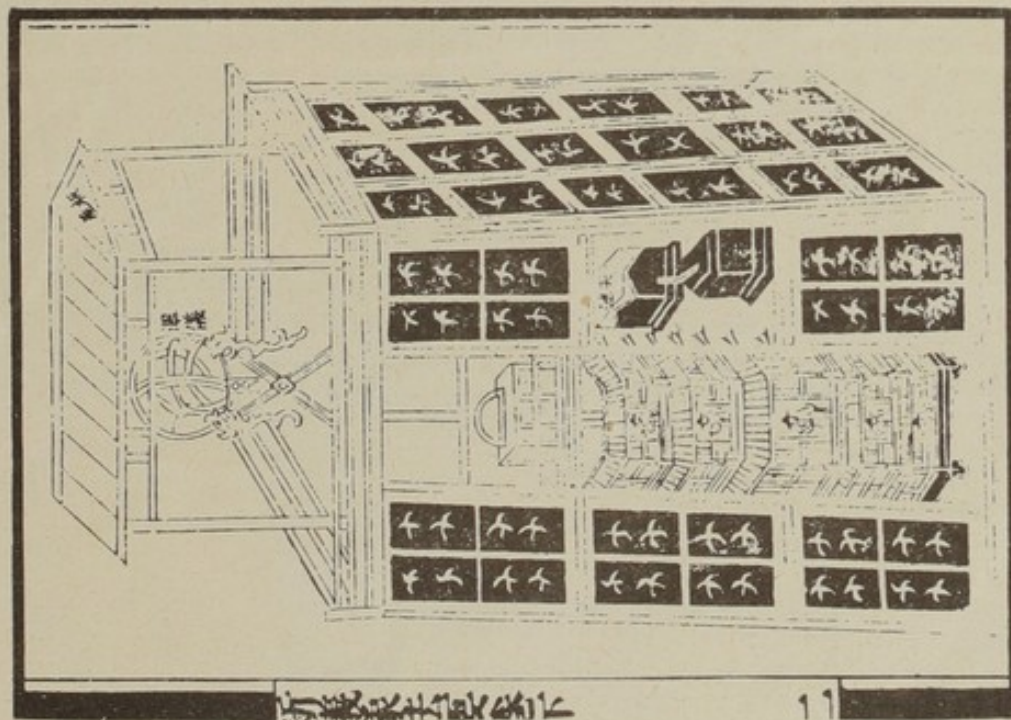


Fig. 1. Astronomical clock of A.D. 1088 from Su Sung's "Hsin I Hsiang Fa Yao", ch. 3, p. 2a. External appearance. The armillary sphere on the platform above, the celestial globe in the upper chamber of the tower, and the pagoda with the time-announcing jacks below this. On the right, the housing removed to show the water-tanks. Estimated total height about 30 ft.

Fig. 2. The same as Fig. 1. General view of the works. Vertical shaft with jack-wheels in the foreground, behind this the driving-wheel with its scoops. Water-tanks on the right, part of the anti-recoil device on the left at the top. Escapement not shown in this diagram, though the device above the wheel is probably intended for part of it.







or mercury. Besides the rotation of the sphere and globe by trains of gear-wheels, the clock embodied elaborate time-keeping jack-work. The escapement consisted of a weigh-bridge which prevented the fall of each scoop until full, and a trip-lever and parallel linkage system which checked the rotation of the wheel at another point. An anti-recoil device was also built in. The basic principle involved is thus more like the anchor escapement of the late seventeenth century than the verge and foliot type, although the time-keeping is, of course, governed mainly by the flow of water rather than by the escapement action itself. This type of effect is therefore the 'missing link' between the time-keeping properties of a steady flow of liquid and those of mechanically produced oscillations. So complete is the description, which has yielded more than a hundred and fifty technical terms of eleventh-century mechanics, that it has been possible to prepare detailed working drawings of the clock (Figs. 3 and 4).

The full understanding of this text has enabled us to interpret many descriptions of other clocks contained partly in the dynastic histories and partly in other sources, some from books now lost, but preserved in the "Yü Hai" encyclopædia of A.D. 1267. Thus an important astronomical clock driven by mercury was built by Chang Ssu-Hsün, a Szechuanese, in A.D. 979. The tradition seems to start with an

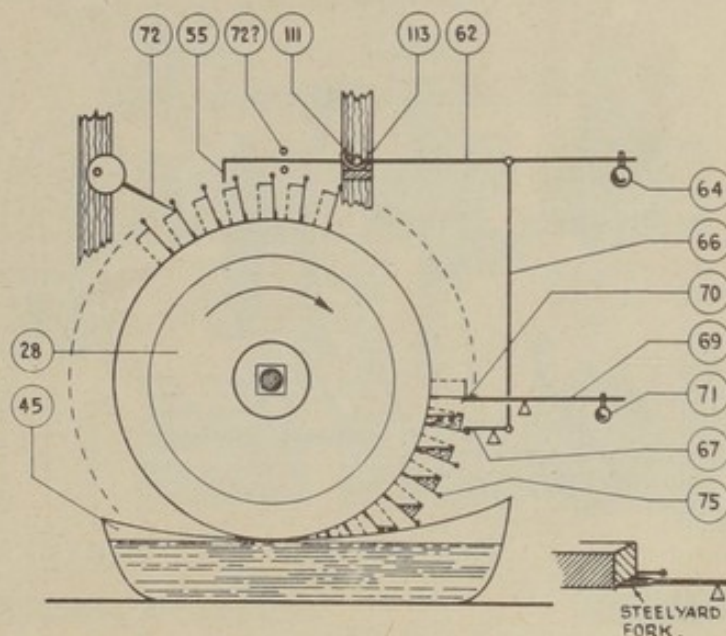


Fig. 4. Diagram of the escapement, with its weigh-bridge and parallel linkwork. The clepsydra flow delivered into the scoop at 70. (Drawn by Angel)



instrument completed in A.D. 725 by the Tantric monk, I-Hsing, and an engineer named Liang Ling-Tsan, the description of which would not have been comprehensible without thorough prior study of Su Sung's text.

Earlier texts describe celestial globes or demonstrational armillary spheres rotated by clepsydra water. These range from the work of Chang Hêng about A.D. 130 to that of Kêng Hsün about 590, but evidence of any escapement is absent. We supposed at first that these employed only the sinking float of a large clepsydra. This was the system of the Hellenistic anaphoric clock with its rotating astrolabic dial<sup>6</sup>, and perhaps also of the famous striking water-clocks of the Byzantine<sup>7</sup> and Arabic<sup>8</sup> culture-areas. But textual and historical considerations incline us rather to the view that the clepsydra water dripped on to a scoop-wheel, turning a shaft with a trip-lug which constituted a pinion of one. This acted on a toothed ring on the apparatus, moving it tooth by tooth.

It thus appears that the Chinese tradition of astronomical clockwork was more nearly in the direct line of ancestry of the late medieval European mechanical clocks. Moreover, the detailed description of this previously unrecognized type of water-driven clock has made it possible to find similar devices incompletely described (perhaps because incompletely known) in Indian<sup>9</sup>, Arabic and Hispano-Moorish<sup>10</sup> texts. Of the transmission of influences little can as yet be said, though there are indications that the European centuries just preceding the fourteenth knew devices with water-powered and mechanically checked driving-wheels<sup>11</sup>. This would suggest that the time of transmission was rather that of the Crusades (as in the case of the wind-mill) than that of the Pax Tartarica and Marco Polo.

All the texts now translated, with commentary and discussion, will, it is hoped, be published as a special monograph by the Antiquarian Horological Society, to which the results of the investigation have been communicated.

<sup>1</sup> Beckmann, J., "A History of Inventions, Discoveries, etc.", vol. 1, pp. 340 ff. (Bohn, London, 1846).

<sup>2</sup> Usher, A. P., "A History of Mechanical Inventions", pp. 191 ff., 304 ff., 2nd edit. (Harvard Univ. Press, Cambridge, Mass., 1954).

<sup>3</sup> Frémont, C., "Origine de l'Horloge à Poids" (Études Expérimentales de Technologie Industrielle, No. 47; Paris, 1915).

<sup>4</sup> Howgrave-Graham, R. P., "Some Clocks and Jacks, with Notes on the History of Horology", *Archaeologia*, 77, 257 (1927). Baillie, G. H., "Watches" (Methuen, London, 1929).

<sup>5</sup> Price, D. J., "Clockwork before the Clock", *Horological J.*, 97, 810 (1955); and 98, 31 (1956).

<sup>6</sup> Vitruvius, IX, 8. Cf. Drachmann, A. G., "The Plane Astrolabe and the Anaphoric Clock", *Centaurus*, 3, 183 (1954).



- <sup>7</sup> Diels, H., "Über die von Prokop beschriebene Kunstuhr von Gaza; mit einem Anhang enthaltende Text und Übersetzung d. *ekphrasis horologii* des Prokopios von Gaza", *Abhandlungen d. preuss. Akad. Wiss. (Phil.-Hist. Kl.)*, No. 7 (1917).
- <sup>8</sup> Wiedemann, E., and Hauser, F., "Über die Uhren im Bereich der islamischen Kultur", *Nova Acta (Abhandlungen d. K. Leop.-Carol. deutschen Akad. d. Naturforsch.)* Halle, 100, No. 5 (1915).
- <sup>9</sup> Burgess, E., "The Sūrya-Siddhānta, a Textbook of Hindu Astronomy", pp. 282, 298, 305 ff., edit. Phanindralal Gangooly (University, Calcutta, 1935).
- <sup>10</sup> Rico y Sinobas, M., "Libros del Saber de Astronomia del Rey D. Alfonso X de Castilla" (Aguado, Madrid, 1864).
- <sup>11</sup> Drover, C. B., "A Medieval Monastic Water-Clock", *Antiquarian Horology* (Dec. 1954).





# LABOUR *and* STRUGGLE

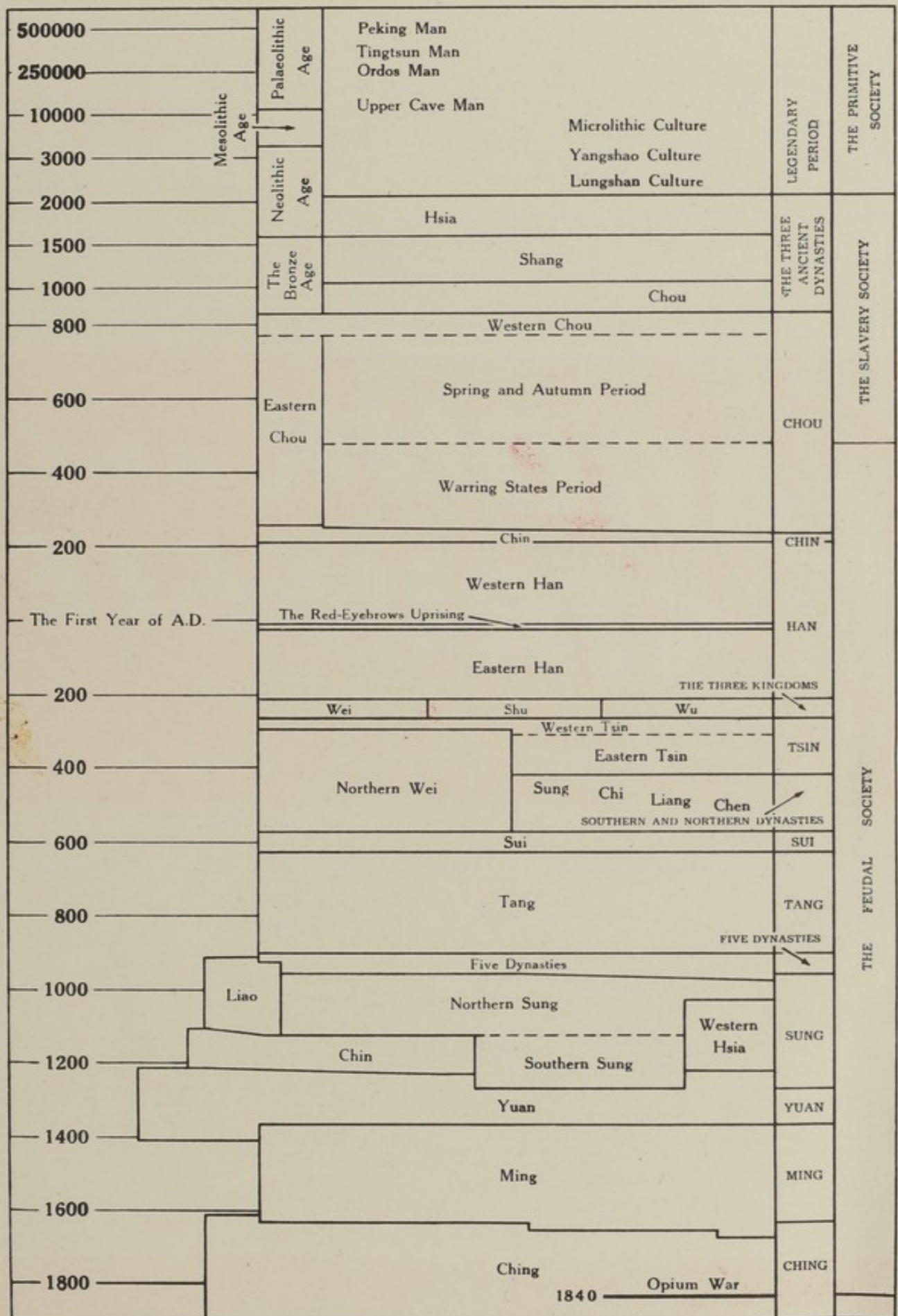
Glimpses of Chinese History



SUPPLEMENT TO CHINA RECONSTRUCTS, APRIL 1960



CHRONOLOGICAL TABLE OF CHINESE HISTORY



# Labour and Struggle

## *Glimpses of Chinese History*

**T**HE CHINESE NATION is not only famous throughout the world for its stamina and industriousness, but also as a freedom-loving people with a rich revolutionary tradition. The history of the Hans, for instance, shows that the Chinese people would never submit to rule by the dark forces and that in every case they succeeded in overthrowing or changing such a rule by revolutionary means. In thousands of years of the history of the Hans, there have been hundreds of peasant insurrections, great or small, against the regime of darkness imposed by the landlords and nobility. And it was peasant uprisings that brought about most dynastic changes. All the nationalities of China have always rebelled against the foreign yoke and striven to shake it off by means of resistance. They accept a union on the basis of equality, not the oppression of one nationality by another. In thousands of years of history of the Chinese nation many national heroes and revolutionary leaders have emerged. So the Chinese nation is also a nation with a glorious revolutionary tradition and a splendid historical heritage.

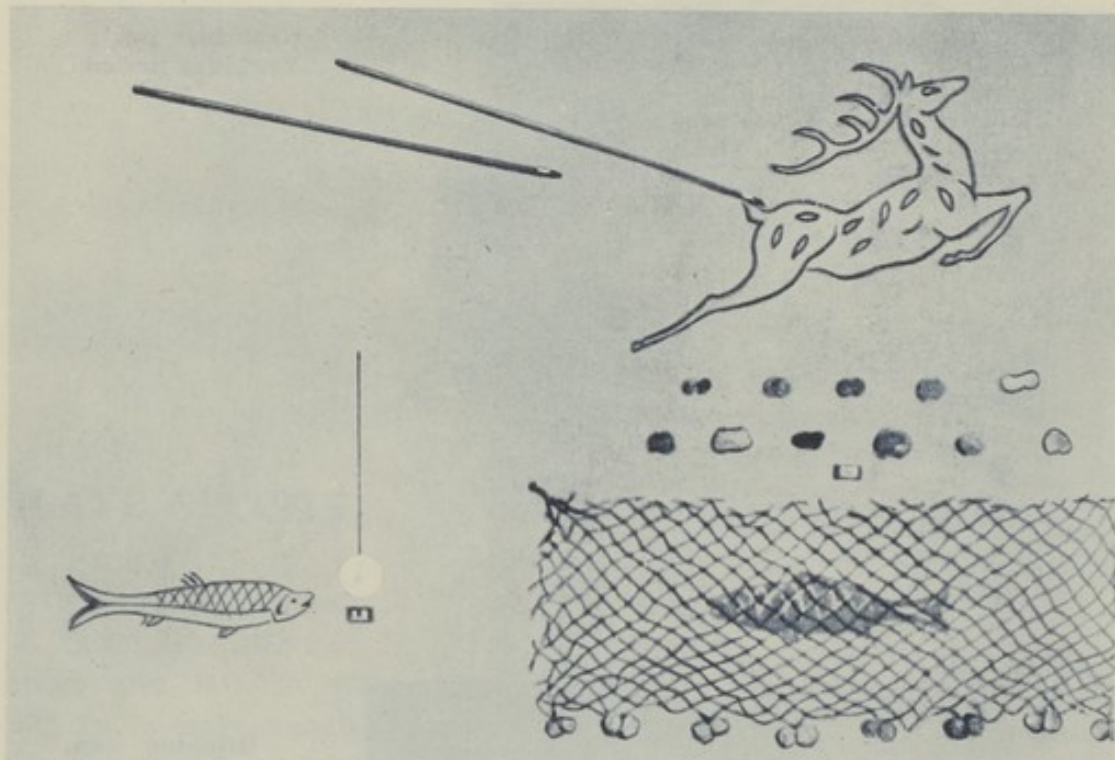
— MAO TSE-TUNG  
*The Chinese Revolution and  
the Chinese Communist Party.*

This pamphlet, like the Museum of Chinese History from whose thousands of exhibits as we have picked a few for illustrations, covers the period from the first known signs of human society in China, some half a million years ago, to the year 1840—when China was invaded by western imperialism and our people began their modern struggle, now crowned with brilliant success, for national and social revolution.

It covers three stages of Chinese society—the primitive clans, the stage of slavery and the stage of feudalism.







Neolithic hunting and fishing.

## PRIMITIVE SOCIETY

AT THE LEFT is a statue of Peking Man (*Sinanthropus Pekinensis*). Traces dating back 500,000 years show that he trapped animals and hunted them, worked with stone tools, and used fire. Living in caves, these early people, by joint labour and struggle, wrested the means of existence from nature and protected themselves against the elements and wild beasts.

The Tingsun and Ordos men, 100,000 years ago, were more developed both physically and culturally. They were hunters and food gatherers.

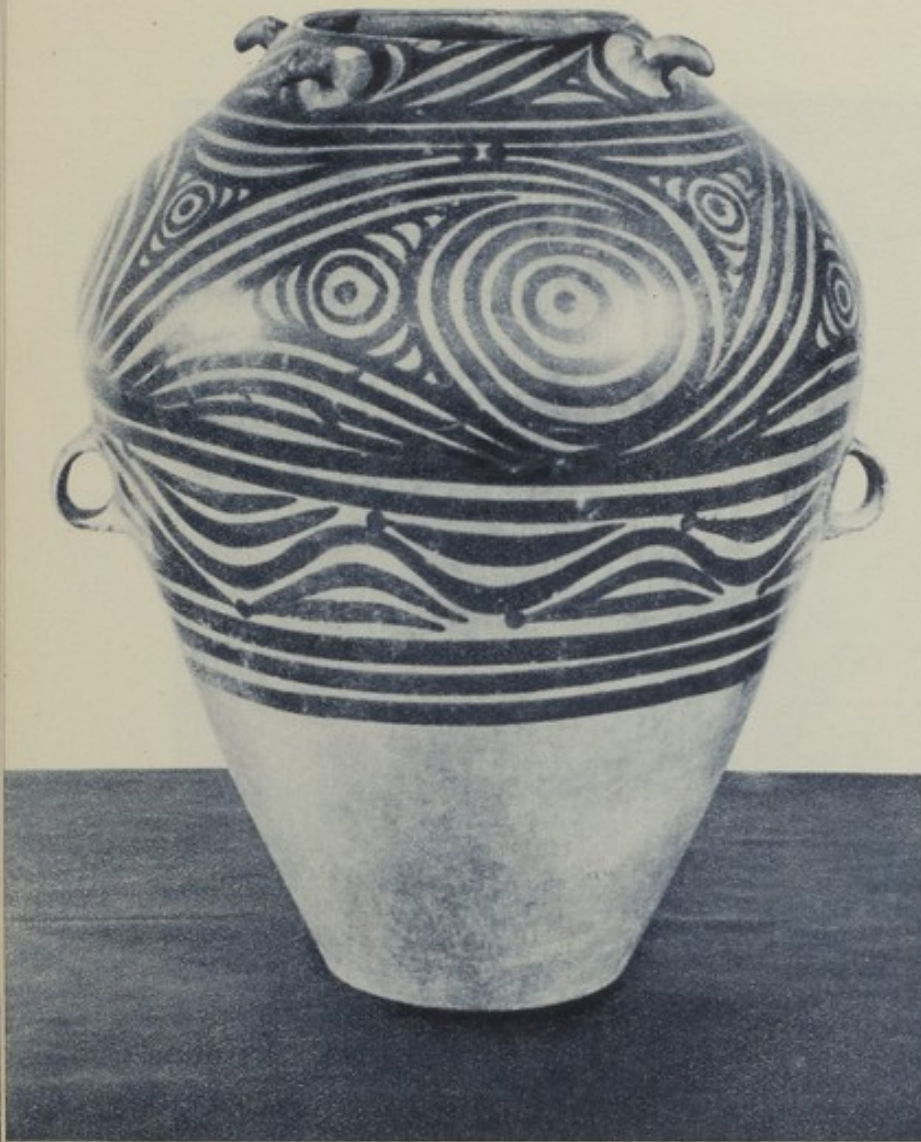
Forty or fifty thousand years ago, the Upper Cave Man had developed a more advanced system of social organization. Bone needles reveal that clothing was sewn from skins. Objects of primitive art survive from this remote time.

In the Mesolithic (middle stone age) period, around 10,000 years ago, game was hunted with stone arrows and spearheads.

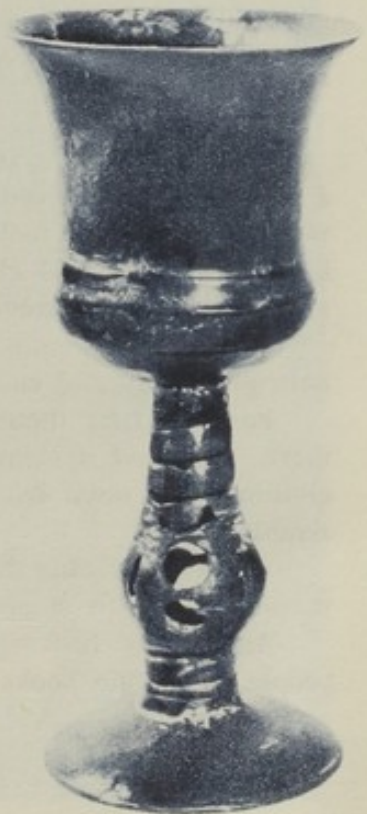
Agriculture became important among China's Neolithic (new stone age) people, and bone hooks and weighted nets were used for fishing (*see above*).



Neolithic jar,  
Yangshao period.



Drinking cup,  
Lungshan period.



**F**IVE THOUSAND years ago, people were growing millet along the Yellow River and rice along the Yangtze and herding cattle and sheep on the northwestern steppes. In the Yangshao period (c.3000 B.C.), beautiful pottery painted with elaborate black designs (*see above*) was made to store food and drink, and the first fabrics were woven from flax. In the Lungshan period (c.2000B.C.), the productive forces moved much further forward. Stone scythes and wooden ploughs were used. Fine black pottery was made in many shapes (*right*). Herds and flocks increased. A surplus over subsistence requirements led to the earliest exchange, appropriation of private property, and the beginnings of class society and oppression—gradually replacing the old, equal clan by the slave system.



## SLAVE SOCIETY

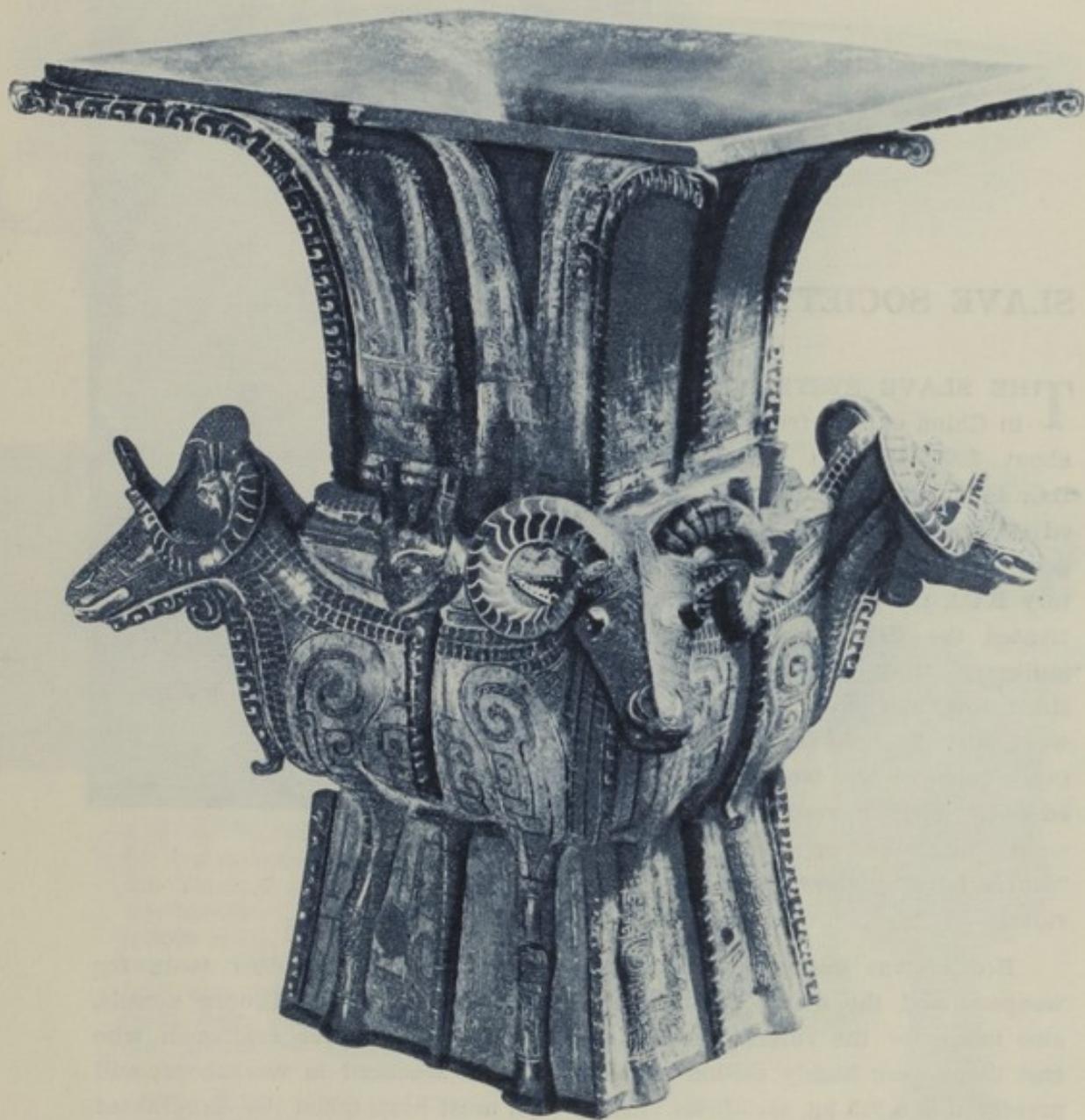
**T**HE SLAVE SYSTEM in China existed from about 2000 B.C. to 475 B.C. In an early organized state, the Shang kingdom (c. 16th to 11th century B.C.), the slaves cultivated the fields, grew mulberry trees to feed silkworms, and spun and wove silk. To help farming, a calendar was worked out. Written records were kept (as in the "oracle bone" pictured at right).



Oracle-bone inscription.

Bronze was used for spades, picks, axes, chisels and other tools, for weapons and the metal parts of the aristocrats' chariots. Bronze vessels, also made for the rulers were of great beauty. The slave craftsmen who cast them were highly skilled metallurgists and laboured in workshops; still preserved is a 875 kg. sacrificial vessel which must have taken the coordinated efforts of at least 200 men. They were also consummate artists (see the bronze vessel decorated with the figures of four sheep shown overleaf).





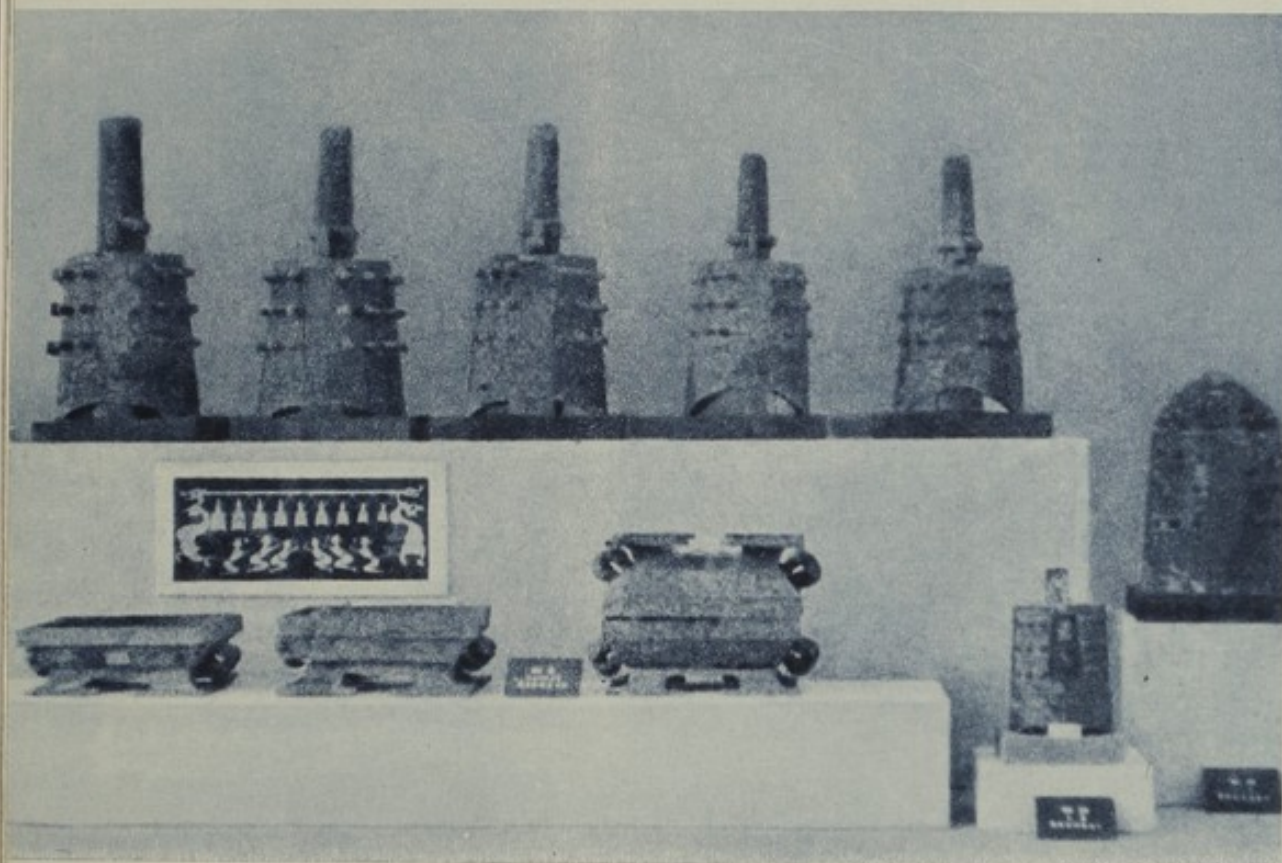
Bronze vessel with heads of big-horn sheep. Later Shang dynasty (16-11th century B.C.). It stands 59.4 cm. high.





Detail of vessel, showing fineness of decoration.





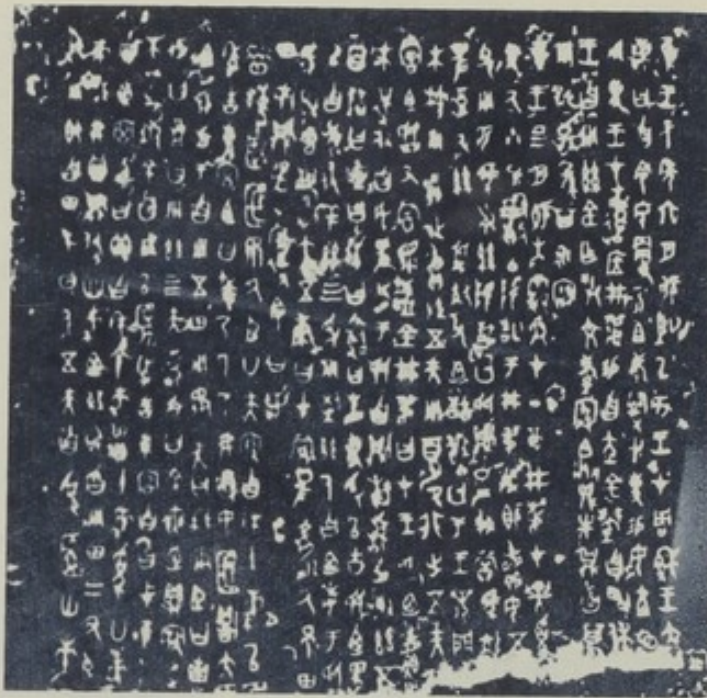
Bronze bells and vessels from the household of Duke Tsai of the Western Chou unearthed in Anhwei province. "They eat from bronze vessels to the accompaniment of ringing bells," said an old chronicle telling of the nobles' luxury.

**T**HE SLAVES, by contrast with their rulers, lived amid poverty and horror. Many were killed and entombed in the graves of nobles and kings. In the 11th century B. C., a slave revolt facilitated the overthrow of the Shang state by Western Chou, which ruled until 770 B.C.

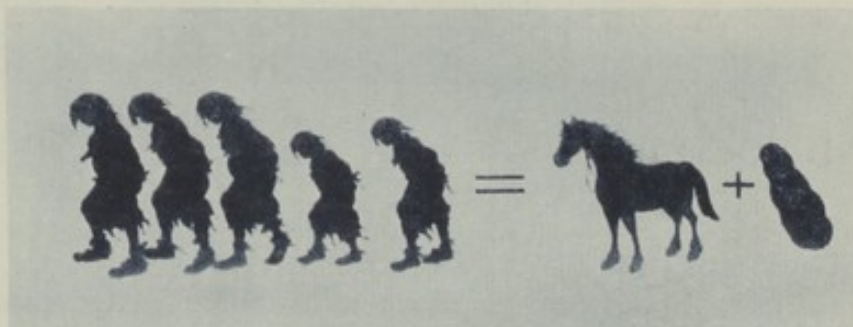
Under this dynasty, land was considered to be the property of the state (the king) who allotted it to the nobles of different ranks. The main class conflict was between the nobles and the slaves.

In the succeeding Spring and Autumn period (770-475 B.C.), iron implements were used and reclamation and improved techniques increased crops. The nobles, disregarding the king, made the land their own. In 594 B. C. a land tax was introduced, to be paid in money or kind, and the obligation to pay this form of rent gradually replaced the old master-slave relation. The system of exploitation became feudal.





The slave traffic is recorded in an inscription on a bronze vessel of the time of King Hsiao of Chou (884-870 B.C.). A part of it reads: "I am exchanging five of your slaves for a horse and a hank of silk." The transaction is represented graphically below.



5 slaves = 1 horse + 1 hank of silk





Confucius holding a class.

*Modern painting by Hu Jo-ssu*

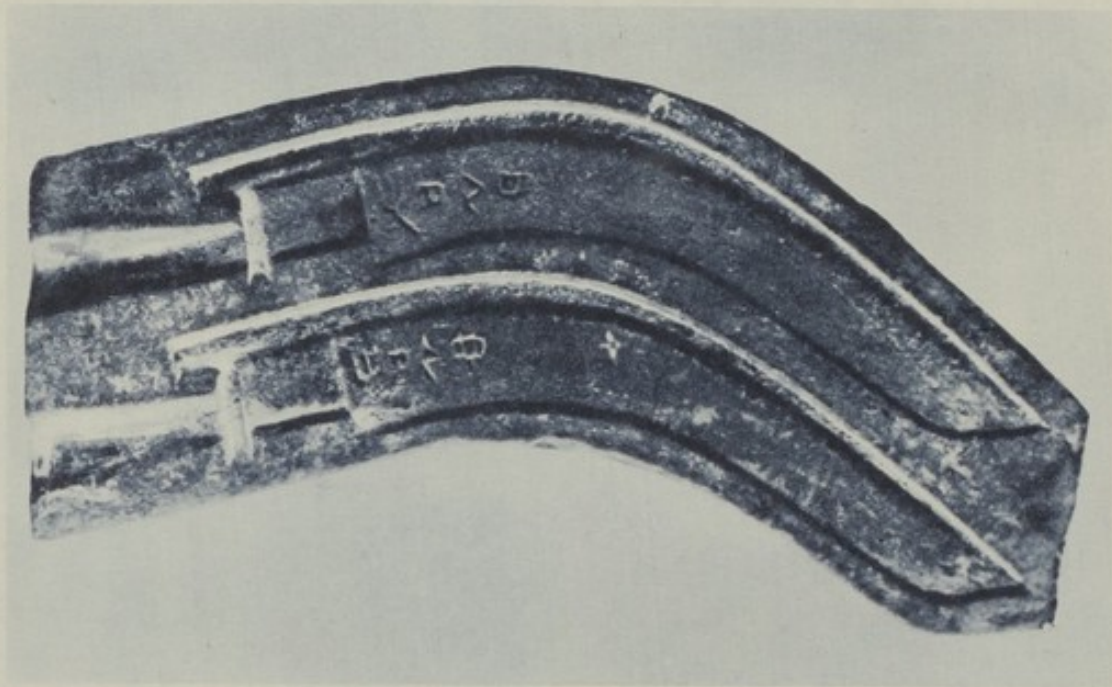
As always when a social system is in violent change scholars and philosophers debated and discussed. Outstanding among them was Confucius (551-479 B.C.) who is pictured with his students above. Summing up the culture and knowledge accumulated up to then, previously the preserve of officials, he transmitted it to anyone who wanted to learn. He included in his collections some songs and poems of the common people. After his death he became the official philosopher of the new feudal order.

## FEUDAL SOCIETY

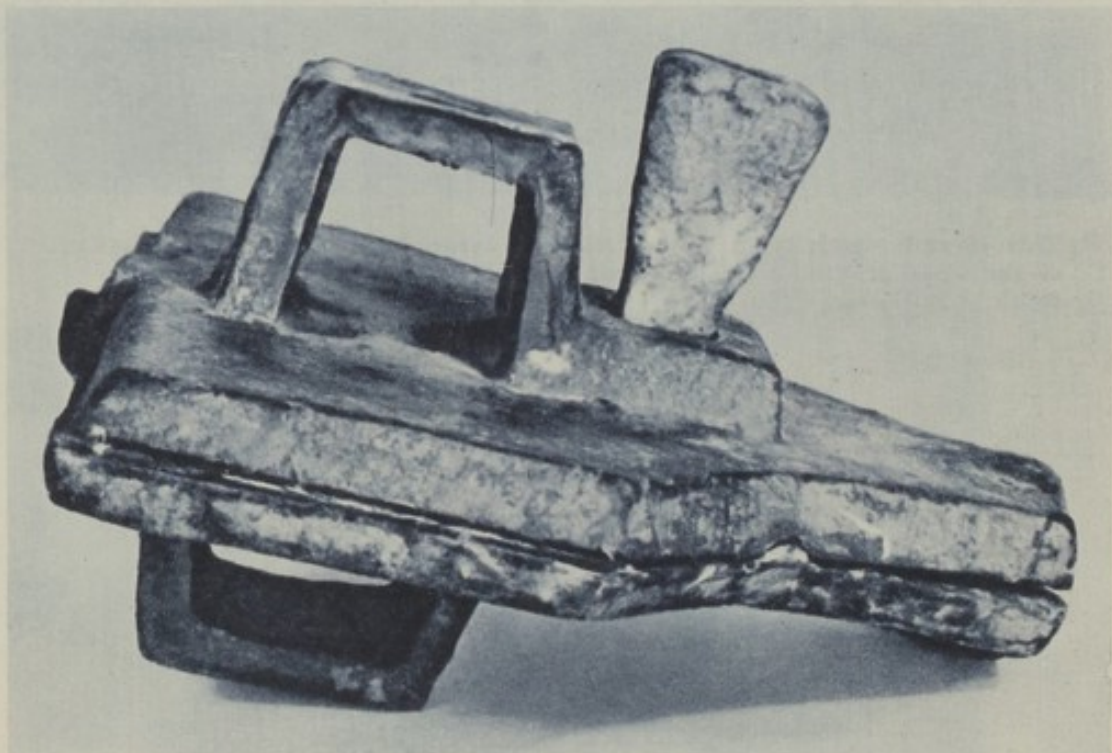
**F**EUDAL SOCIETY lasted, in China, for some 24 centuries.

It established itself in the Warring States period (475-221 B.C.). The introduction of manual blast furnaces and improved casting techniques brought iron ploughshares and other tools into wide use and much more land was farmed. Progress was made in water conservancy and irrigation.





Iron casting-mould for scythes, Warring States period, found in Hsinglung, Hopei province in 1953.



Iron mould for hoe-blades, from the same site.





This ceramic spout from Ihsien, Hopei province, which was the capital of the state of Yen, shows the fine architecture of the towns of China some 2,400 years ago. Handicrafts were at a high artistic level.





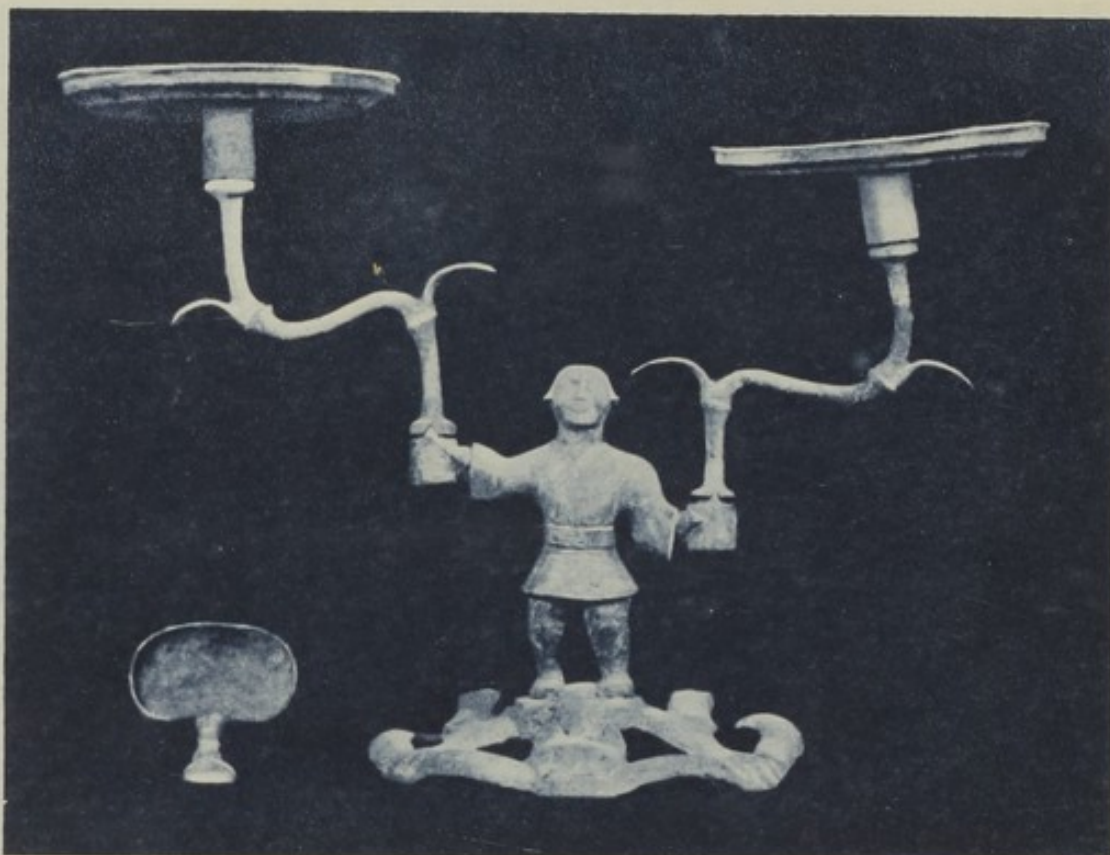
THE UPRISING OF THE 'RED EYEBROWS' (A.D. 24), one of China's earliest peasant revolts. A drawing done specially for the Historical Museum by Liu Ling-tsang.





Meeting between Emperor Tai Tsung of the Tang dynasty (A.D. 618-907) and a Tibetan messenger. Attributed to Yen Li-pen (A.D. ?-673). Size: 38.5 cm. x 128.5 cm.





Man-shaped bronze lamp and oil spoon, Warring States period (475-221 B.C.).

### "HUNDRED SCHOOLS CONTEND"

TOWARD the end of the Warring States period, a fierce battle of ideas was waged between the "hundred schools" of philosophical thought—reflecting different class interest. Besides the school of Confucius, within which differences developed, others arose. The followers of Lao Tze took more interest in nature, less in government. The Mohists, or school of Mo Ti, were against the privileges of the aristocracy, emphasized the principle of love and stressed that the material world was the root of knowledge—they spoke for the craftsmen. The Legalists, as represented by Han Fei Tze, condemned the rites and ceremonies of privilege and stood for central authority and strict laws applicable to all.





**LAO TZE** (5th century B.C.) had some elements of dialectical materialism.



**HSUN TZE** (3rd century B.C.) held that man could conquer and harness nature.



**HAN FEI TZE** (3rd century B.C.), a "legalist", held that power should be concentrated in the hands of the monarch and governed by law.



**MENG TZE** (*Mencius*), 4th century B.C., advocated good government and held that the people were the foundation of the state.

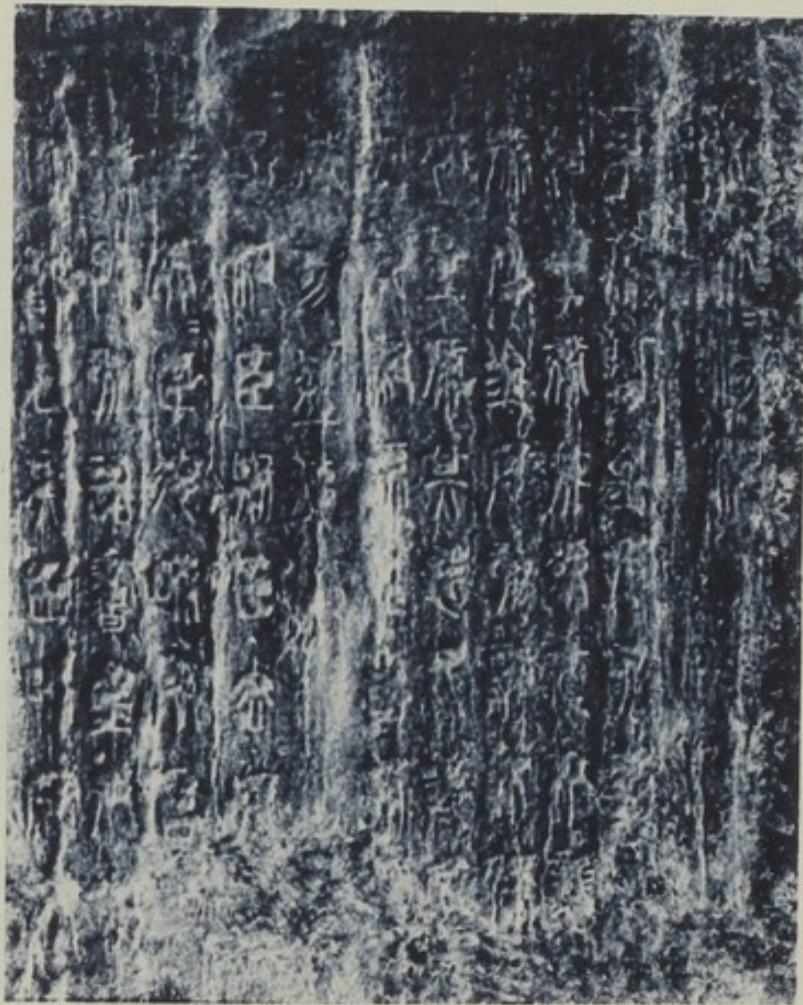


**MO TI** (5th century B.C.), founder of the Mohist school. He taught that all men must love, not hate or make war on one another.



## CHINA UNITED

**O**WING to the development of the economy, people of all classes demanded centralized government over wider areas. After 180 years of war, the Chin state, in which reforms and the legalized buying and sale of land had removed some curbs on economic growth, defeated all its rivals. By 221 B.C. its ruler, Shih Huangti, became the first emperor of all China, and it was in his reign that the Great Wall was built.



The stone tablet above (Shantung province, 219 B.C.) is one of many set up to extol the power of the Chin emperor throughout the newly-unified country. The "tiger tally" shown below, was a bronze symbol of authority. One of its longitudinally-split halves was issued to local military commanders. The other was kept by the imperial government. Only when it was sent to match the commander's half, did he have the right to move troops.

The short-lived Chin dynasty, exhausting the people with forced labour and severe punishments, was overthrown by a great peasant rising. The Western Han dynasty (206 B.C.-A.D. 24) which followed continued to rule all China.



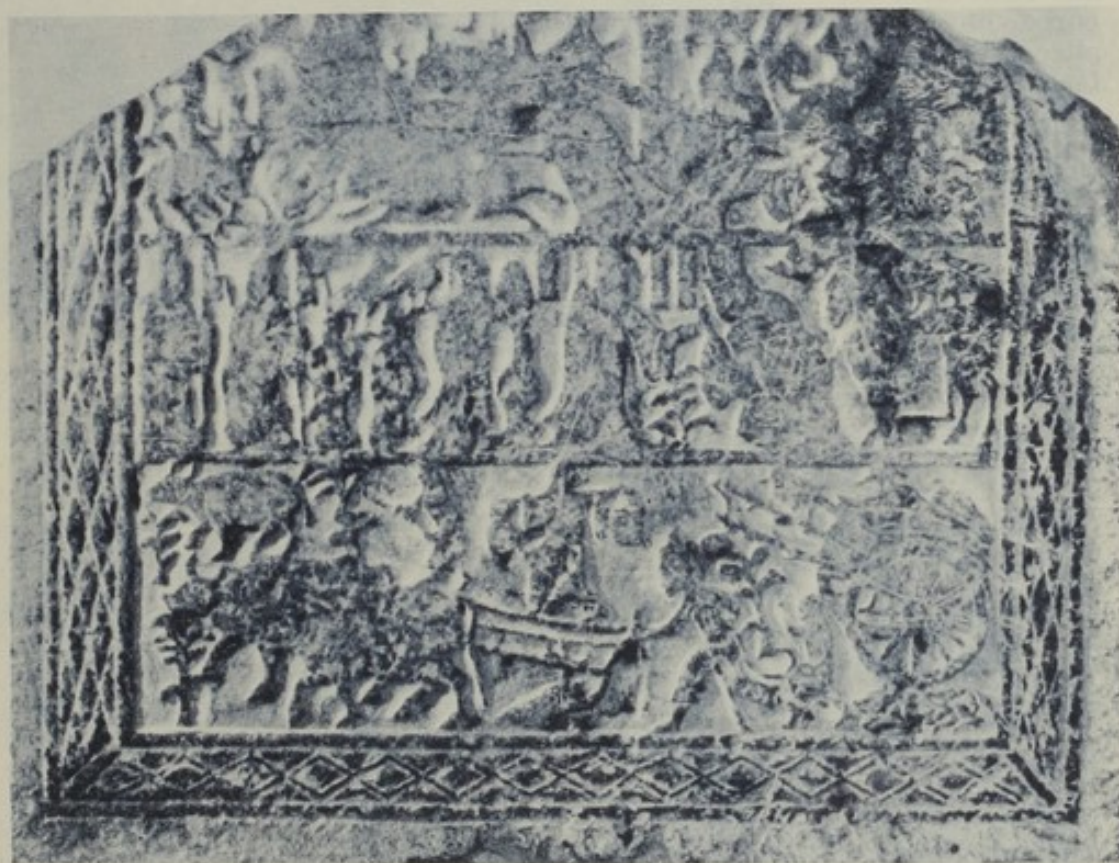
It too, after concentrating land ownership in the hands of the few, was destroyed by extensive peasant revolts, including that of the "Red Eyebrows" (see colour plate, page 13).



## HAN DYNASTY LIFE AND CULTURE



**T**HE next dynasty, the Eastern Han (A.D. 25-220) witnessed much material progress. An important improvement in South China was deep ploughing with the ox-drawn iron plough, as shown in the stone carving redrawn above. Field management also became much more meticulous, further raising yields.



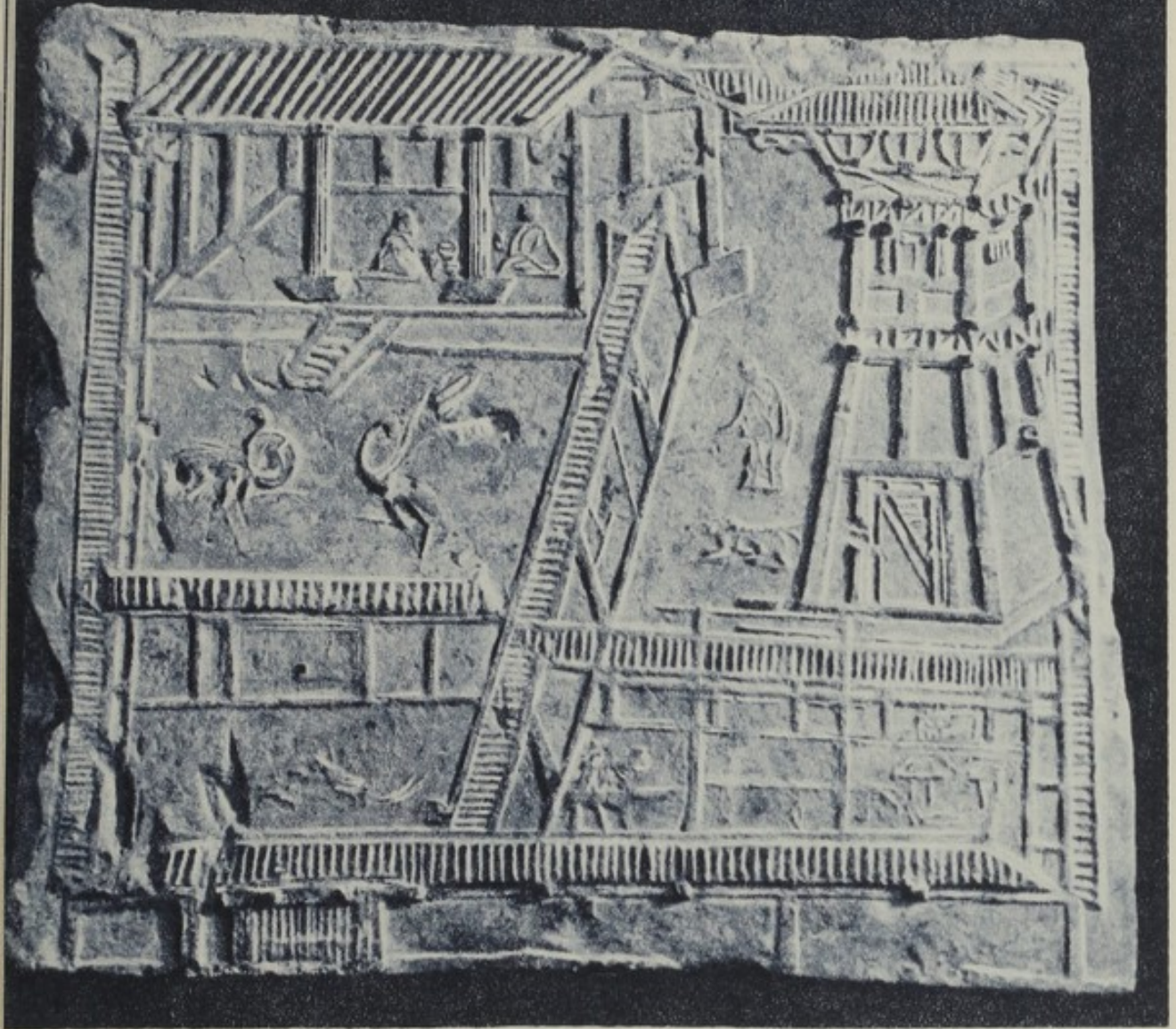
Actual photograph of the stone carving.





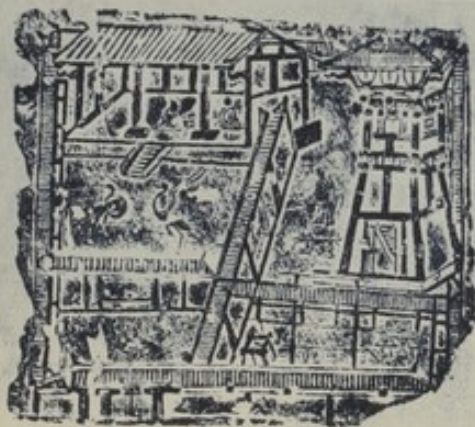
This earthenware statuette of a drummer of the Eastern Han dynasty, found in Szechuan province, testifies to the lively, realistic art of the time.





Wealthy home, Eastern Han.

HOW big landlords lived under the Eastern Han is shown in the brick-engraved picture of the courtyard home of a wealthy family, unearthed in Szechuan. Three halls are connected by covered passages. In one, the master is entertaining a guest. In the foreground is the kitchen, at upper right, a tower from which armed guards could keep a sharp watch to protect his safety and property.





While the landlords waxed fat, many peasants were driven from the land and became homeless. In death as in life there were contrasts. The carvings on the previous pages come from the tombs of the rich. The simple stone below, dated A.D. 115, marked the resting place of an offender against some feudal regulation who died in captivity while doing hard penal labour.

In the last 80 years of the dynasty, there were over a hundred peasant risings. A folk song of the time shows their unconquerable spirit:

*Our hair is like the leek; cut it off, it grows still!*

*Our heads are like the chicken's; cut them off they sing still . . .*

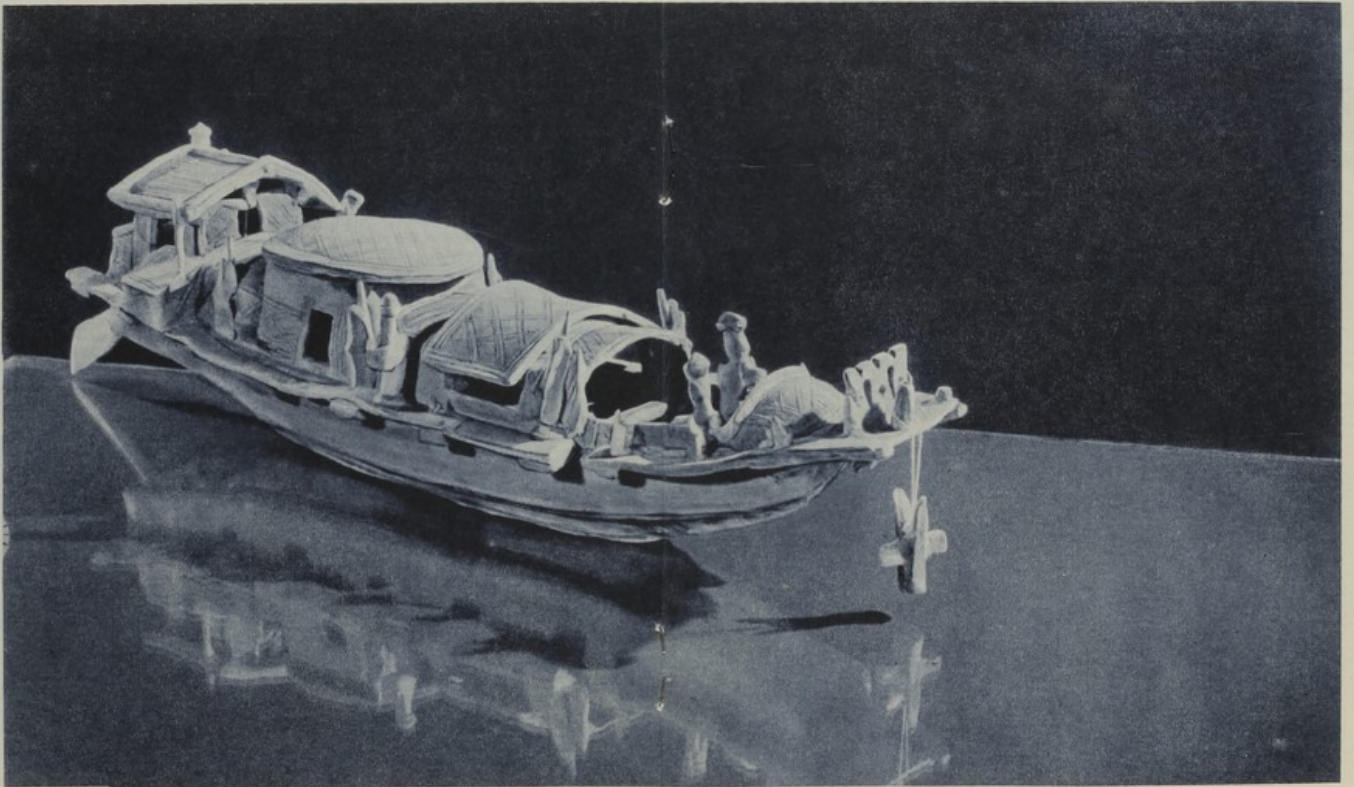
*Have no fear of the officials.*

*Don't hold the people too cheap.*

The peasant unrest culminated in the vast Yellow Turban Rising (A.D. 184) which put an end to Eastern Han.

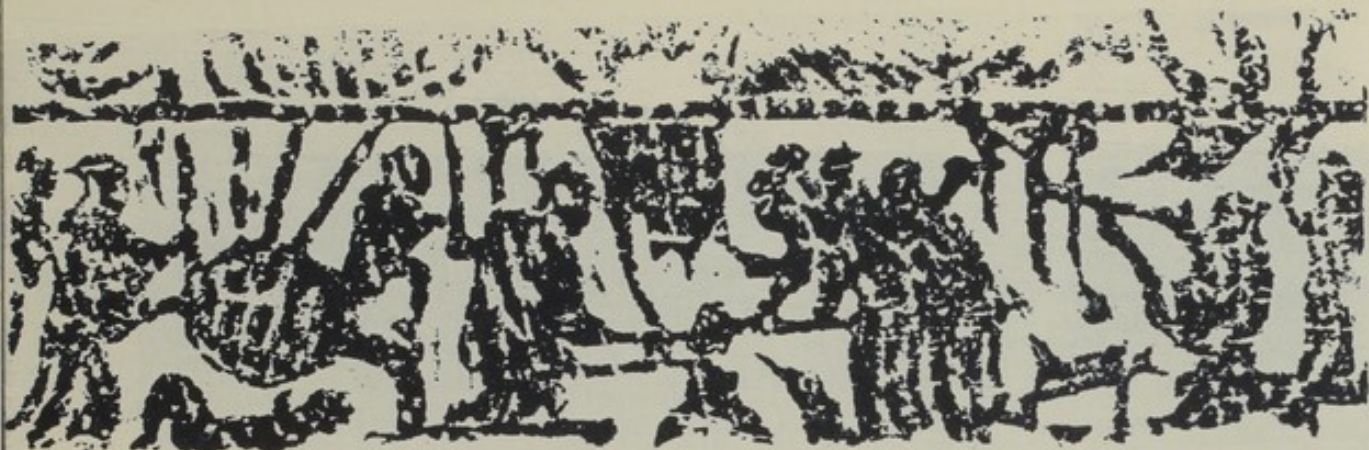






This finely-made pottery model, unearthed in Canton, shows how rudder-steered boats of improved construction increased water transport under the Eastern Han.





How ironworks of the Eastern Han period functioned and were organized is pictured on the stone carving from Shantung province that runs across the top of these pages.

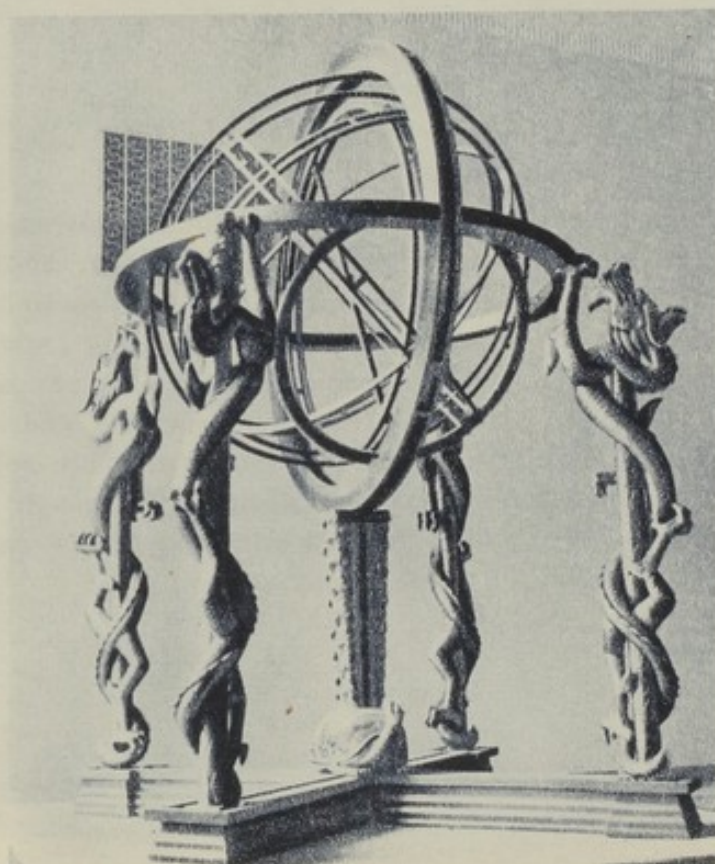
Science flourished during this period. World's first seismoscope model (*below*) was made by Chang Heng in A.D. 132. Earth tremors caused a ball in one of the dragons' mouths to fall into the mouth of one of the frogs, indicating the direction of earthquakes, which it could detect at a considerable distance.







Armillary spheres were among the astronomical instruments made at the time. The one here depicted, though dating from the 11th century, follows the principle of earlier ones.





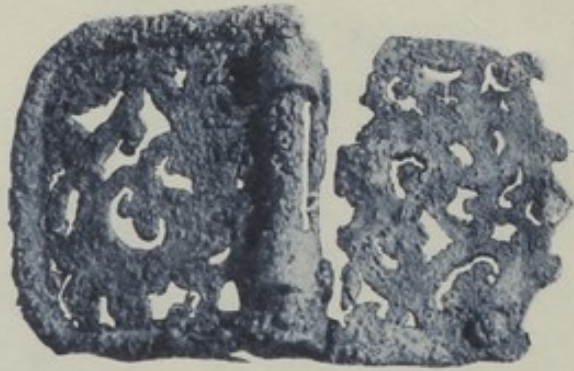


Two sheep of olive-green porcelain (A.D. 265). Excavated from a Nanking tomb of the Wu state (Three Kingdoms period), they show the high development of handicrafts in southeast China.

## WARS AND MERGING OF NATIONALITIES

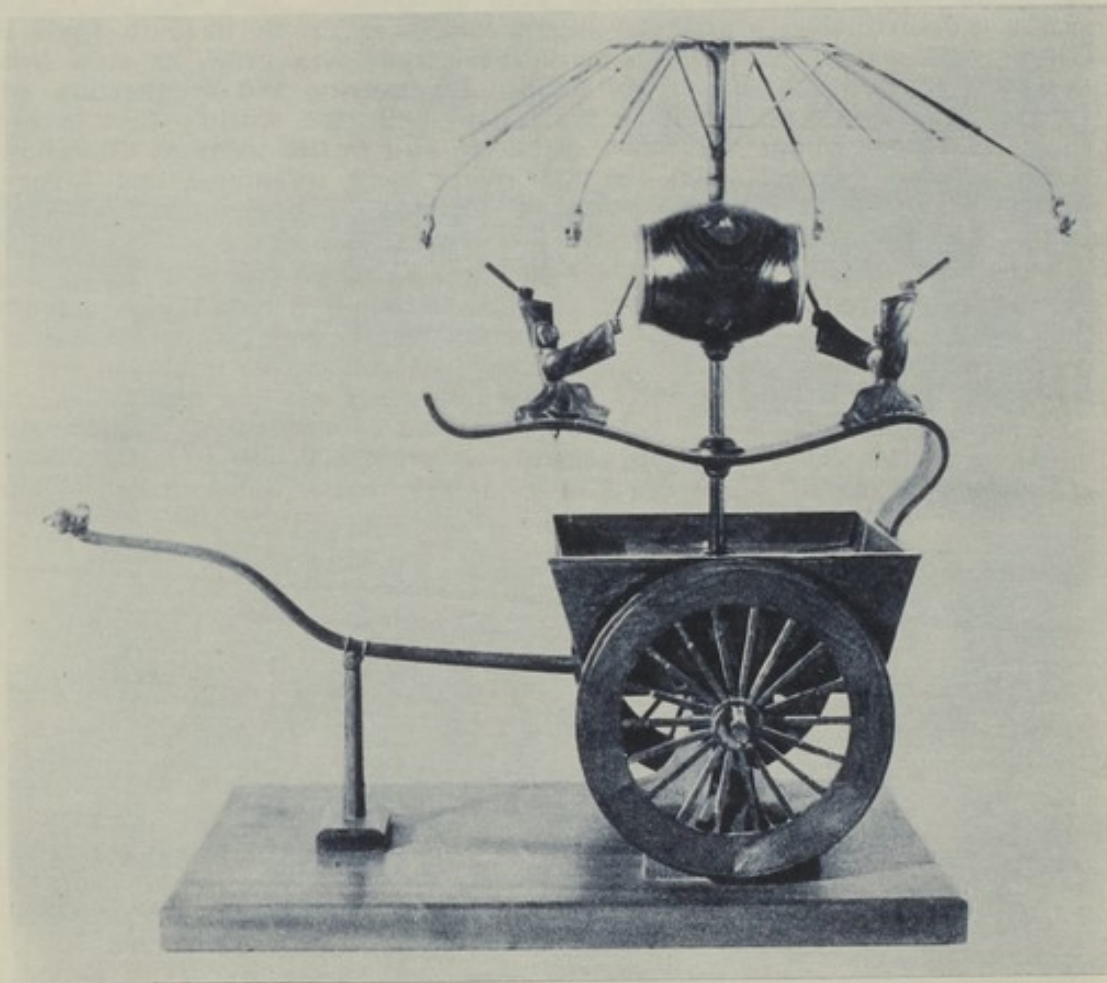
**A**FTER the overthrow of Eastern Han, the country was again temporarily divided. In the period of the Three Kingdoms (A.D. 220-280), Tsao Tsao the ruler of the Wei state in the central China plain, revived the economy there by restricting landlord power and making his army grow its own food. The states of Shu and Wu, on the upper and lower Yangtze respectively, also made concessions to the peasants. They were reunited under the Western Tsin (A.D. 265-316), but north and south were once more split apart as a result of invasions by northern peoples. Gradually, through economic and cultural ties and exchange, these merged with the Hans—each nationality feeding its achievements into the common stream.



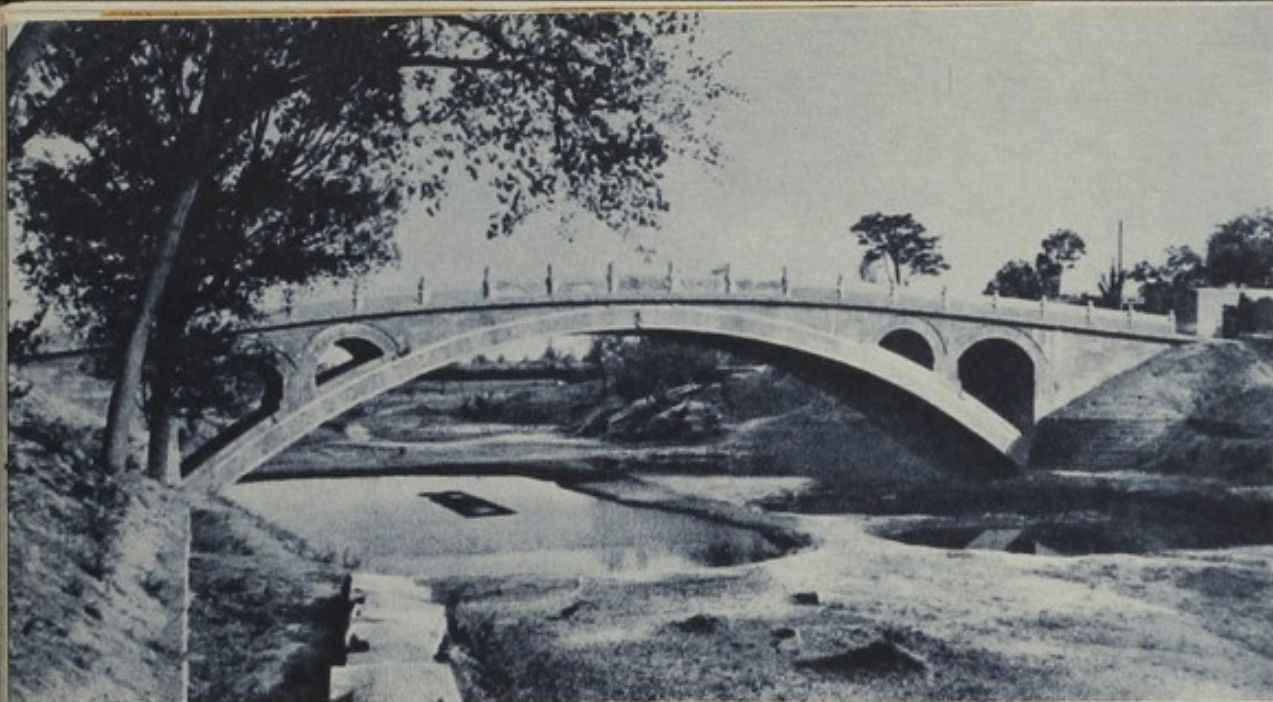


Proof of highly-developed metallurgy is this belt buckle, buried with its owner in A.D. 297 in Kiangsu province and recently excavated. It is made of an alloy containing a high percentage of aluminium.

The "drum cart", operating with a system of gears, recorded the mileage travelled. It is reconstructed from old stone-engravings and pictures.





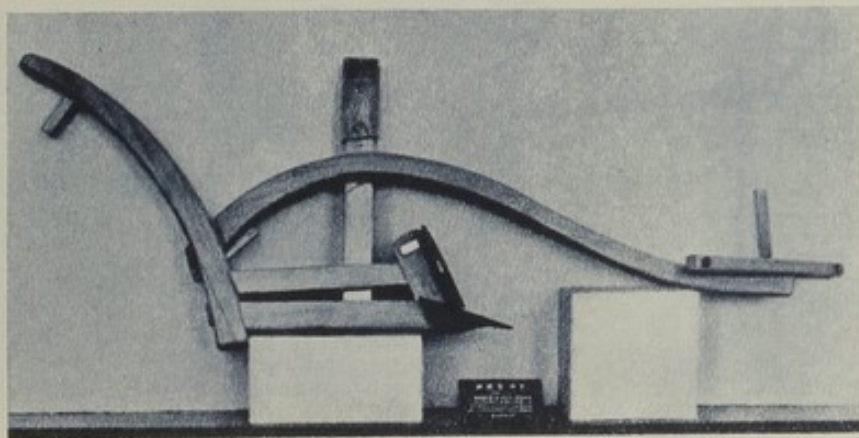


The 1400-year-old bridge at Chaochow.

### THE AGE OF TANG

**T**HE SUI DYNASTY (A.D. 581-618) brought the country once more under single rule. Great public works were undertaken. One was the Grand Canal, a 2,000-kilometre artificial inland waterway for north-south trade in China completed in A.D. 610. International trade was brisk, as seen from the coins of Persia found in Sui tombs. Engineering and architecture advanced. Li Chun, sixth century craftsman, built the world's first arched single-span stone bridge with open spandrels, still in use today at Chaochow, Hopei province (*above*). But the Sui rulers were tyrannical and luxury-loving. Taxes were collected years in advance. The peasants rose once more. The Sui dynasty fell.

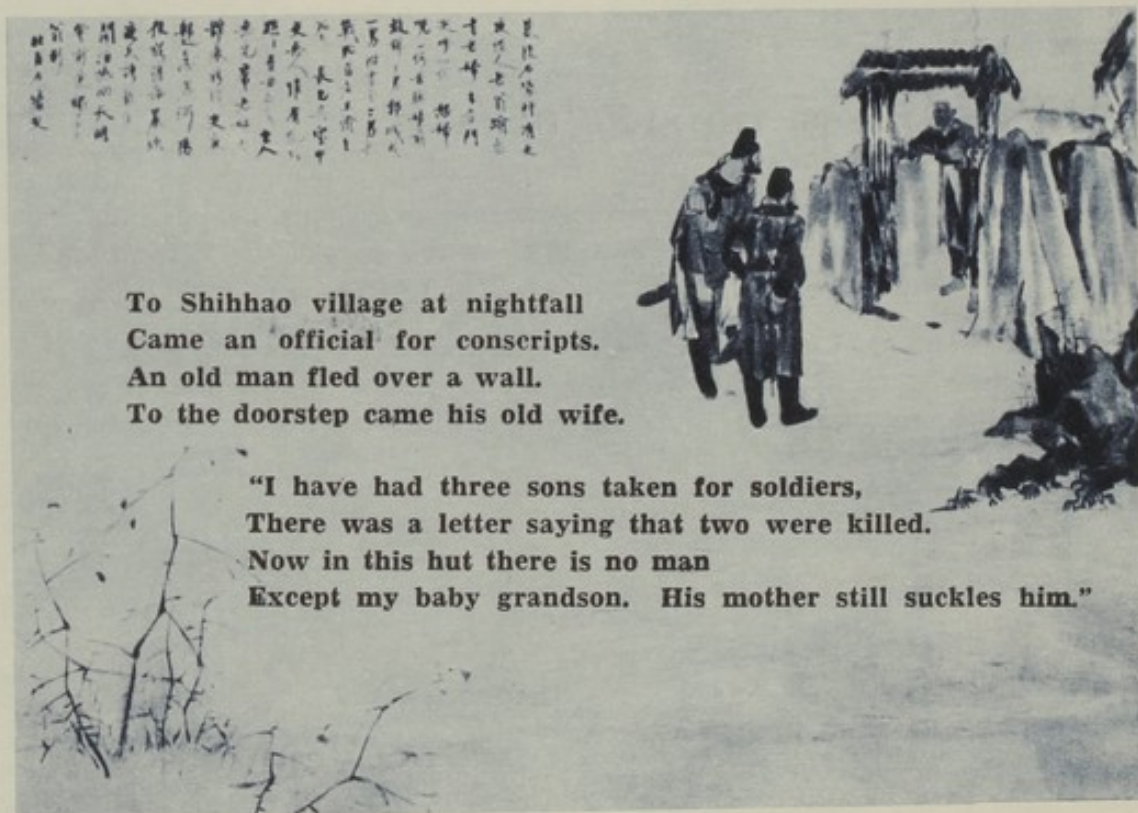
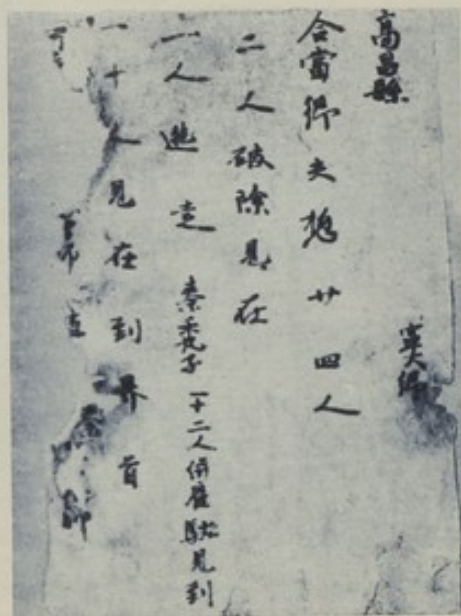
The new Tang dynasty (A.D. 618-907) was to prove the most prosperous age of Chinese feudalism. Born after peasant revolt, it began with reforms that eased the lot of the people. Production was helped greatly by the invention of the curved-shaft plough (*below*). Irrigation was improved by the water-wheel with chained barrels. Cities flourished and the arts and crafts with them. In foreign trade, extensive overland connections developed with central Asia (*see colour plate on page 31, showing musicians from the "Western Regions"*) and by sea as well as land with India, the Arab world and the Eastern Roman Empire.



Plough with curved shaft, Tang Period.



**B**UT the landlords and the rich soon began once more to ruin the countryside through land-seizures, taxes and conscription for external wars. The official order at right calls for recapture of a runaway conscript. The Tang poets, such as Li Po, Tu Fu and Pai Chu-yi whose writings are the glory of Chinese literature, sympathized with the plight of the common. The lines below, condensed from verses written in A.D. 759 by Tu Fu, tell of the excesses of conscription.



To Shihhao village at nightfall  
 Came an official for conscripts.  
 An old man fled over a wall.  
 To the doorstep came his old wife.

"I have had three sons taken for soldiers,  
 There was a letter saying that two were killed.  
 Now in this hut there is no man  
 Except my baby grandson. His mother still suckles him."





Huang Chao, a modern statue of whom appears above, was the leader of the countrywide peasant revolt (A.D. 875) that shattered the Tang dynasty.

### PROGRESS UNDER THE SUNG DYNASTY

**A**FTER half a century of internecine war following the fall of Tang, the Sung dynasty was set up in A.D. 960. In this period, China contributed greatly to world science.

Seed-strains and cultivation were improved. A "wooden horse" was made for transplanting rice. Water-power was used to drive bellows for iron-smelting, and machinery for processing tea leaves. The arts of porcelain and painting rose to new heights.

Particularly important were the inventions of the Sung era.





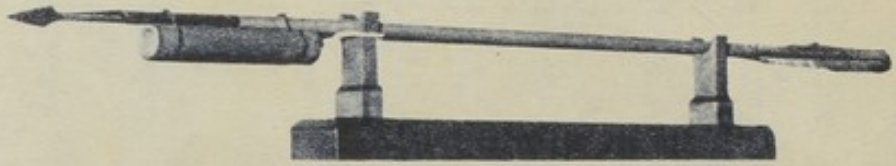




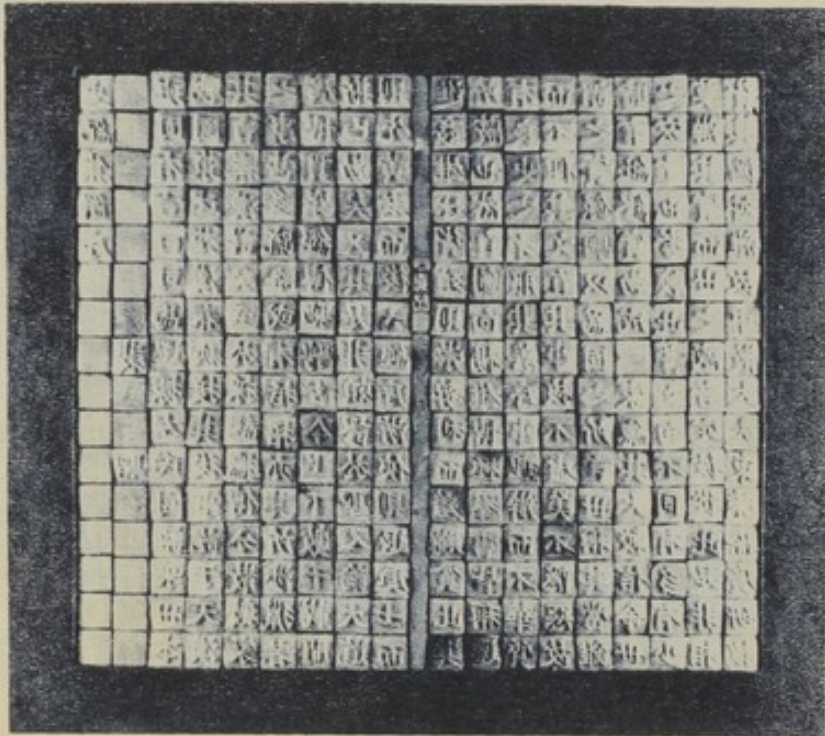
BY THE RIVER AT THE CHING-MING FESTIVAL, painted by Chang Tse-tuan, a vivid picture of rural life in the Sung dynasty (A.D. 960-1279). Size: 24.8 cm. x 528.7 cm.



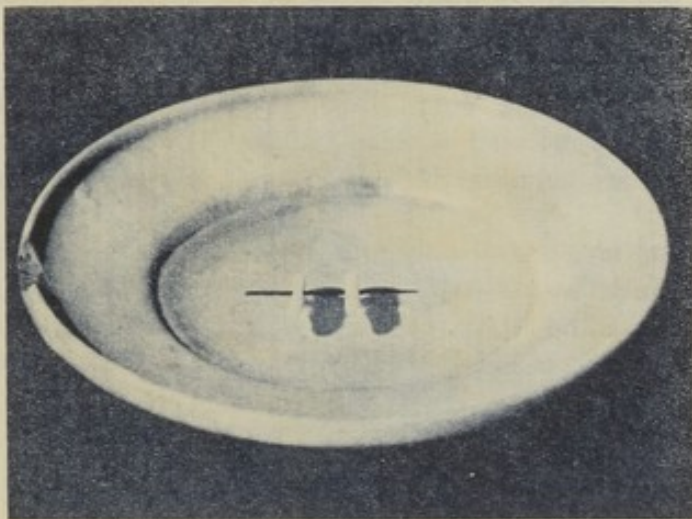
## SUNG INVENTIONS



**GUNPOWDER:** First discovered in the Tang period, it was used in the Sung to propel the first military rockets, set off by igniting a cartridge affixed to an arrow.



**MOVABLE TYPE:** Devised in 1041 by Pi Sheng, it revolutionized the earlier method of printing from woodblocks, invented in China much earlier.



**THE MARINER'S COMPASS:** This first took the form of a magnetized needle floated in a bowl of water.





Kublai Khan, emperor of China, receives his vassal, Phagpa, whom he appointed to administer Tibet.

## THE YUAN DYNASTY

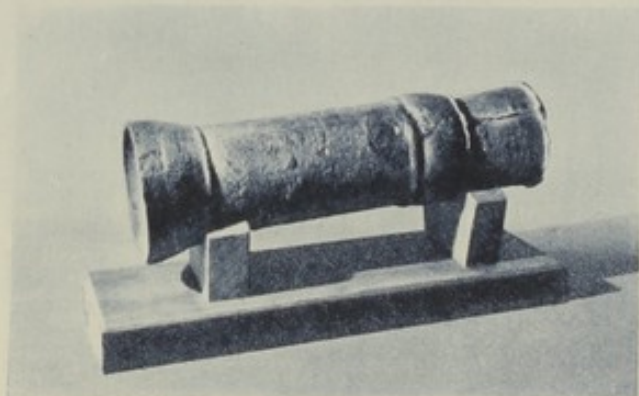
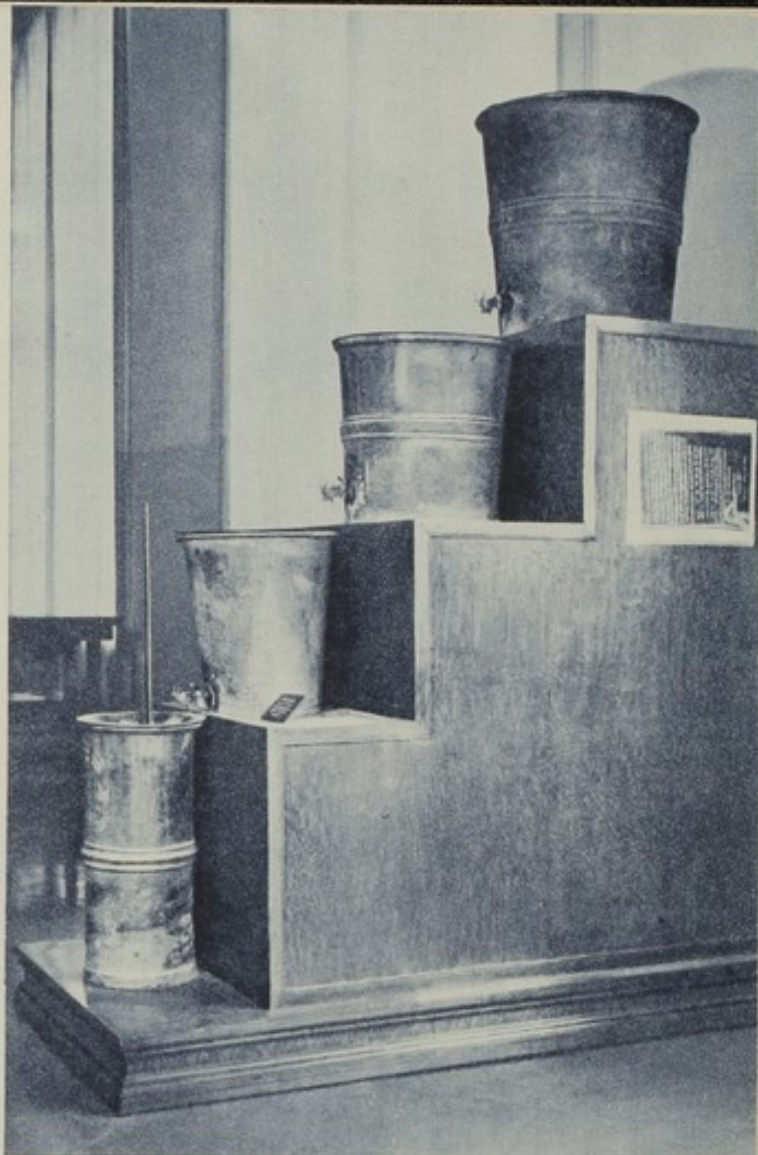
**T**HE YUAN DYNASTY was set up in 1279 when the Mongolian armies of Kublai Khan overthrew the Sung. It was a period of the further unification of China's nationalities.

In the middle of the 13th century, Phagpa, the Grand Lama of Sakya, came from Tibet to pay homage to the Yuan emperor. Tibet was already part of China, and Phagpa was appointed as local ruler. The painting on this page, a mural in the Tibetan lamasery of Trashi Lhunpo shows Kublai Khan receiving Phagpa.

Notable in the Yuan dynasty was the advance and spread of cotton spinning and weaving. Astronomical instruments were improved. The drama flourished under Yuan, Kuan Han-ching (13th century) and other remarkable playwrights made it an art through which the people expressed their hatred of the oppressors.



This water-clock made in 1316, was the earliest complete clock built in China. The time was recorded by the movement of the graduated rod in the lowest bucket. A mechanical clock using sand was also devised.



Bronze cannon of 1332, the oldest known in the world.



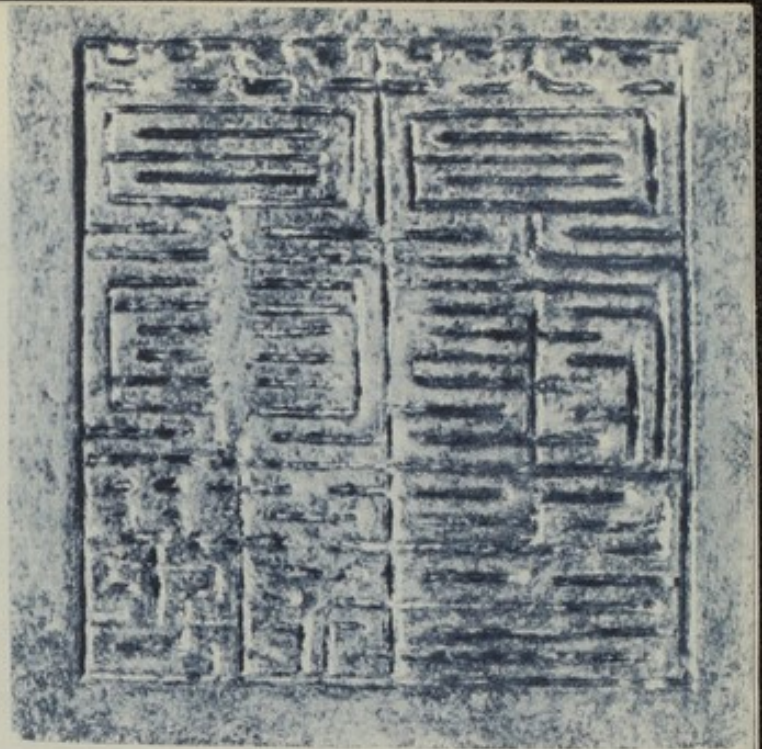


**This mural, from the Taoist temple at Yunglo, Shansi province, shows the high state of painting in the 13th century, under the Yuan dynasty.**



## THE MING DYNASTY

**T**HE Yuan dynasty was destroyed, like the previous ones, by the flame of peasant wrath. The seal of office at right was used by the government set up in Anhwei province by a revolutionary army under Han Lin-erh and Liu Fu-tung in the year 1355.



Seal of peasant revolutionaries, A.D. 1355.

The Ming Dynasty, set up by the leader of another peasant rising, Chu Yuan-chang, witnessed further development both internally and in China's international contacts.



The woodcut at left, taken from a Ming book, shows Cheng Ho, the great navigator of Hui nationality who led seven voyages between 1405 and 1432 to Southeast Asia, India, the Persian Gulf and Arab and African ports. They were made by big fleets; in the biggest, 27,000 men participated.

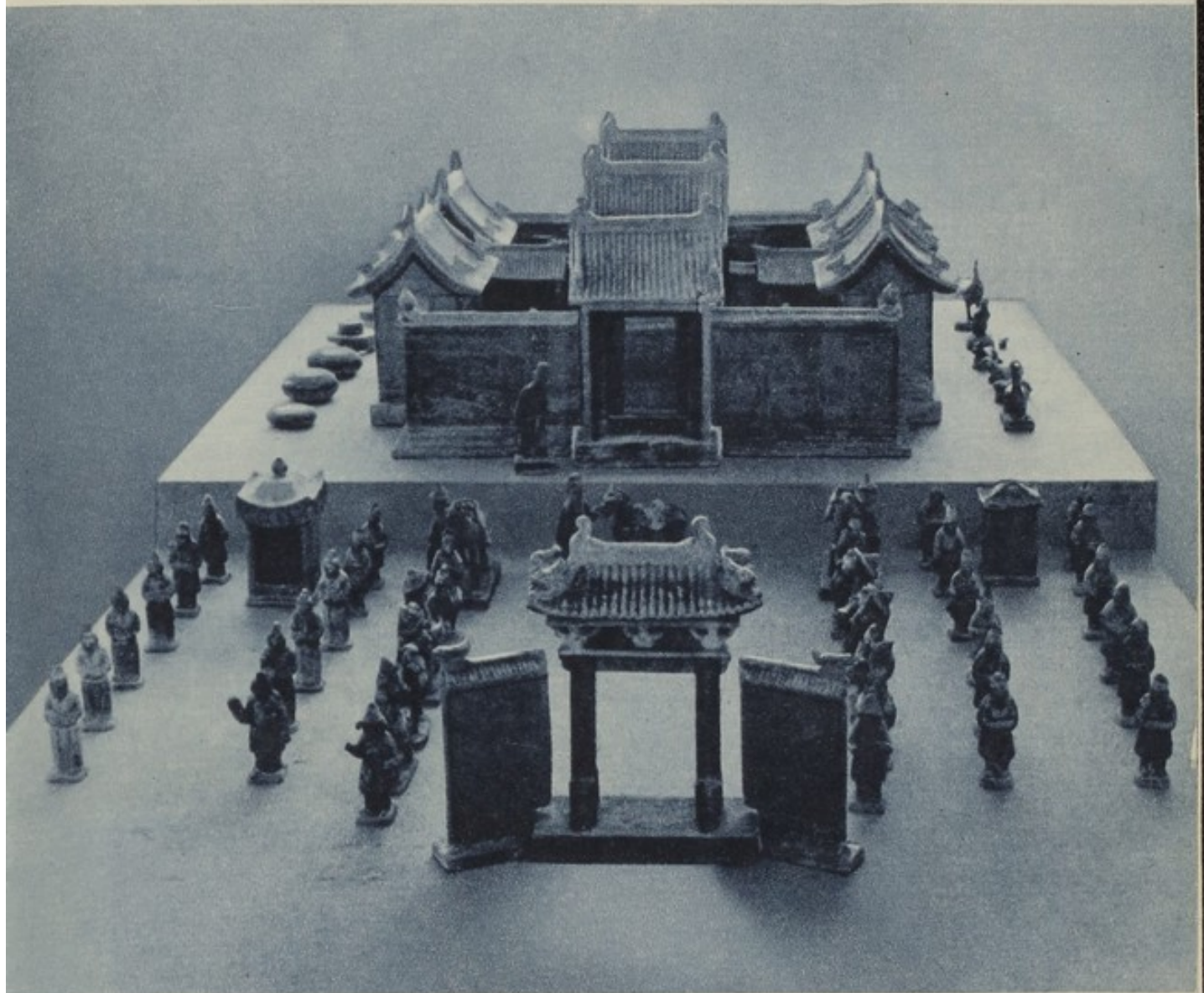
Cheng Ho on board ship.





This covered vase, reign of Chia Ching (A.D. 1522-1568), painted with fish and water plants in red, blue and green. It is typical of fine Ming ware.





**A pottery model buried with a landlord in a Ming village shows the pomp in which this class lived and the multitude of retainers that attended its members when they travelled about in peasant-borne sedan chairs.**

During the Ming dynasty, metal and textile manufacture moved forward greatly. There was recorded, for the first time, a large-scale fight against oppression by urban working people. Ten thousand Soochow silk spinners and weavers, in 1601, rose against high taxes. Ko Hsien, their leader, was so beloved that he was called "Ko the Saint" and the people put up a memorial stone to him in 1673 after his death. In the arts, porcelain-making reached a very high standard.



## LI TZU-CHENG AND CHENG CHENG-KUNG

THE Ming dynasty fell before the peasant risings led by Li Tzu-cheng in northwest and north China and Chang Hsien-chung in the southwest. The statue on the opposite page is of Li Tzu-cheng, also known as Chuang Wang, ("Fearless Prince"). The rural people who loved and followed him sang:

*With Chuang Wang we'll have plenty to eat and wear,  
There'll be no forced labour, no tax in grain.*

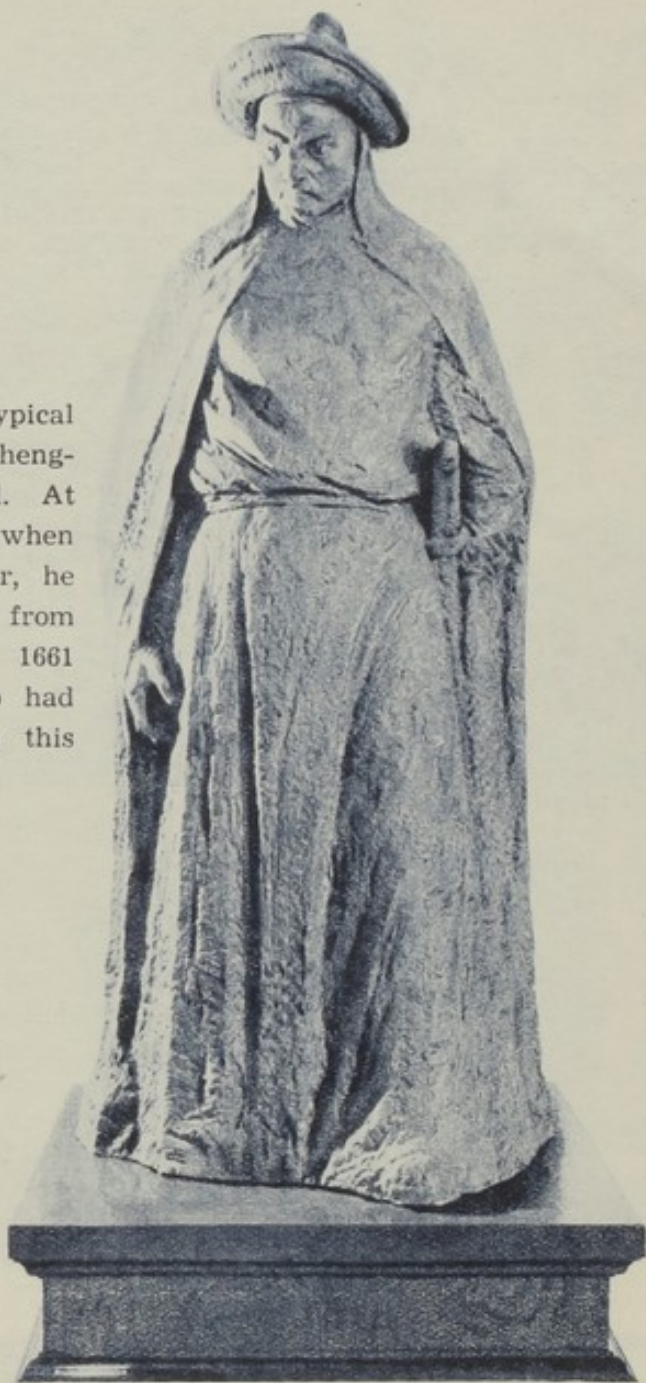
In 1644, the people's army under his command took Peking. The Ming Emperor committed suicide. A brass seal of Li Tzu-cheng's government was recently found in Peking. Soon, however, the traitor Wu San-kuei, representing the feudal forces, called in the Manchu armies from beyond the Great Wall who drove out Li Tzu-cheng and set up the Ching dynasty.



Cheng Cheng-kung

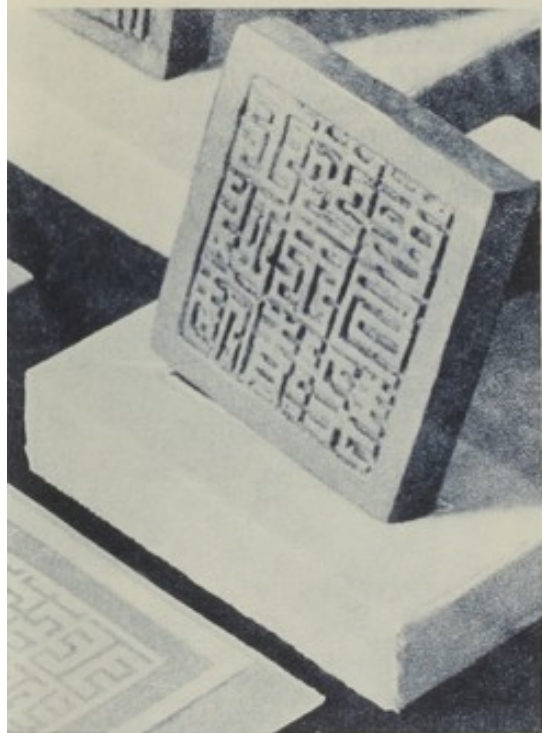


**T**HE painting at left, in typical Ming style, depicts Cheng Chengkung, famous patriot and admiral. At the end of the Ming dynasty, when the Manchus set up their power, he carried on a national struggle from Taiwan, which he liberated in 1661 from the Dutch colonialists who had established themselves briefly in this inseparable part of China.



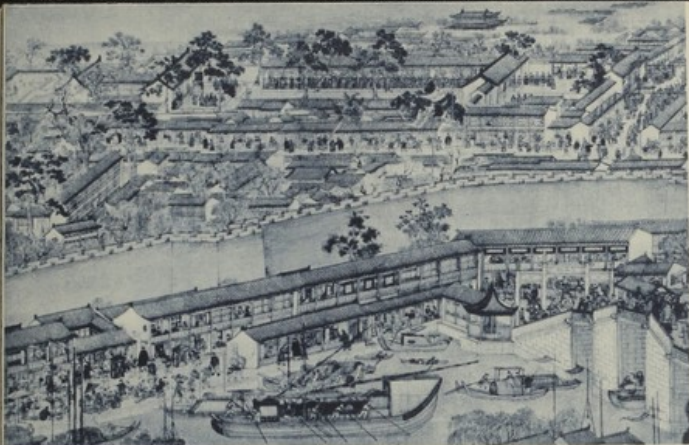
Li Tzu-cheng

*Modern statue by Wang Fuchen and Li Hsiang-mei*



Seal used by official under Li Tzu-cheng.





Eighteenth-century Soochow.



**LAST FEUDAL DYNASTY**

**I**N THE CHING DYNASTY cities developed further. The flourishing aspect of Soochow, Kiangsu province, is shown in the painting above. The plight of the poor, however, is shown by the documents at left, dated 1816 which reads: "Hsu Hsiang-li for lack of money, sells his seven-year-old daughter Fa-li, to be a bond servant. The buyer is not responsible for whatever might happen to her."

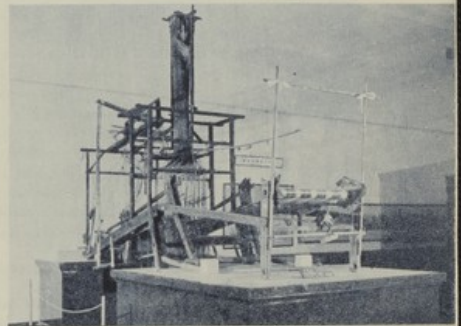
**S**OME 140 years ago, spinners and weavers in the silk manufactories of Soochow staged the first strike of which we know in China. A stone set up there in 1822 proclaimed that "crying rest" (striking) was forbidden by the government.

The Ching dynasty was a period of the development of the unity of China's nationalities. All resisted the exactions of the landlords and the court nobles often in joint battles.

Trade relations with other countries, particularly those of Asia, were extended.

Loom for brocades, c. 1820.

But Chinese society could not attain its full potentialities while feudal exploitation continued. The rapacity of the idle ruling class, and the sufferings of the working folk, continued as before.



Silk-weaving workshop, textile manufacture advanced in this period. Modern painting by Wang Chih-mei



**D**ESPITE over 2,000 years spent under the hardships of the feudal society, the Chinese people created great material and spiritual values by their labour and wisdom. Never intimidated by force, they always had the courage to rise in struggle.

In the next period, which began with 1840 and culminated with the liberation in 1949, the labouring people, always the creators of history, drove out foreign as well as domestic oppressors, thus became masters of their own fate.

In all the millennial history of China, the present period is the most heroic.

This is the theme of Chairman Mao Tse-tung's poem, "Snow" with which we conclude:

**T**HIS is the scene in that northern land;  
A hundred leagues are sealed with ice,  
A thousand leagues of whirling snow.  
On either side of the Great Wall  
One vastness is all you see.  
From end to end of the great river  
The rushing torrent is frozen and lost.  
The mountains dance like silver snakes,  
The highlands\* roll like waxen elephants,  
As if they sought to vie with heaven in their height;  
And on a sunny day  
You will see a red dress thrown over the white,  
Enchantingly lovely!  
Such great beauty like this in all our landscape  
Has caused unnumbered heroes to bow in homage.  
But alas these heroes!—Chin Shih Huang and Han  
Wu Ti\*\*  
Were rather lacking in culture;  
Rather lacking in literary talent  
Were the emperors Tang Tai Tsung and Sung Tai Tsu;  
And Genghis Khan,  
Beloved Son of Heaven for a day,  
Only knew how to bend his bow at the golden eagle.  
Now they are all past and gone:  
To find men truly great and noble-hearted  
We must look here in the present.

\* Author's note: The highlands are those of Shensi and Shansi.

\*\* Early Chinese emperors.



北風吹，千里冰封，萬里雪飄。  
 望長城內外，惟餘莽莽；大河上下，頓失滔滔。  
 山舞銀蛇，原馳蠟象，欲與天公試比高。  
 須晴日，看紅裝素裹，分外妖嬈。  
 江山如此多嬌，引無數英雄競折腰。  
 惜秦皇漢武，略輸文采；唐宗宋祖，稍遜風騷。  
 一代天驕，成吉思汗，只識彎弓射大雕。  
 俱往矣，數風流人物，還看今朝。  
 毛澤東  
 心園春





Joseph NEEDHAM

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CS & DS

with love from  
JN

March 1951

# Science and civilisation in China

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## 5

## SUMMARY AND CONCLUSIONS

A survey on broadest lines will sketch the divergent genius of Chinese and Occidental Civilisation. The city-state and mercantile character of European civilisation was accompanied by a tendency to swing between the poles of atomic materialism on the one hand and idealistic spiritualism on the other. The hydraulic bureaucratic character of Chinese civilisation was accompanied by an organic naturalism (and wave conceptions) which lacked this schizophrenic quality. Greek thought gave to European intellectual atmosphere a geometrical tone; Chinese mathematics, on the contrary, were wholly algebraic. Hellenistic thought, however, produced the great systematisers of the ancient world.

For the first fourteen centuries of the Christian



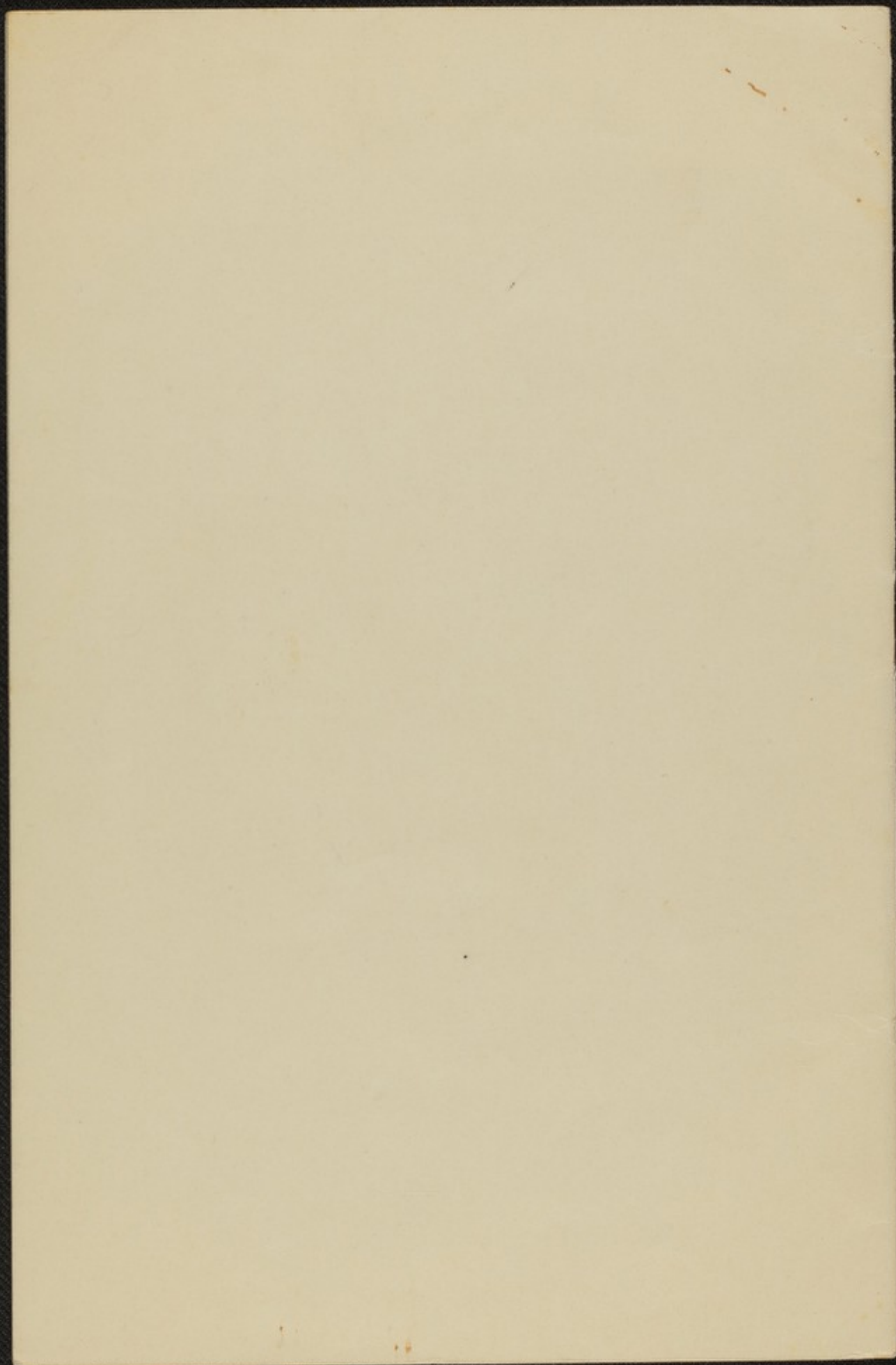
era the flow of technological discoveries and inventions was from east to west. Only with the Renaissance, the Reformation and the rise of capitalism, did modern mathematized natural science take its birth in Europe. Chinese feudal bureaucratism was technologically more advanced than European slave-society or European feudalism, but fell behind in comparison with post-Renaissance science and technology.

If all four of the environmental and societal factors mentioned above (Sect. 4.1-4.3) had been inverted, and if the peoples of Chinese race had inhabited Europe, that veritable archipelago so encouraging for maritime trade, would GALILEO, NEWTON, VESALIUS and HARVEY all have had Chinese names; and would the peoples of Caucasoid race today have had to learn ideographic languages in order to enter in to the results of modern science, just as alphabetical languages have to be learned by Asian scientists today? The data in this book suggest that the answer would be in the affirmative. And that environmental factors were thus of profound importance.

The book seeks to redress many common misunderstandings. The Chinese often misunderstand European culture by thinking of it as primarily scientific and technical, forgetting Greek philosophy, Hebrew prophecy, and Roman law. No less often do Westerners misinterpret Chinese culture by thinking of it as purely agricultural, artistic and literary.

In the eighteenth century European civilisation received from China some of the ideas which alone can save industrial civilisation — Confucian social justice, Mencian belief in the goodness of human nature (upon which hangs the possibility of a just social order), Mencian justification of the revolt against tyrants, Taoist nature-mysticism, Neo-Confucian organicism and morality without supernaturalism — and many other things.

The two civilisations complement each other. They resemble two symphonies by different composers on the same fundamental themes. Their specific qualities and gifts will assuredly be pooled in the world cooperative commonwealth.





BRITAIN-CHINA FRIENDSHIP ASSOCIATION

Annual Conference

April, 1951

PRESIDENTIAL ADDRESS

by Joseph Needham, F.R.S.

As your President-Elect I would first of all like to express my great regret that I am not able to be present personally at the Annual Conference, which unfortunately coincides with my absence from England while carrying out the duties of visiting professor at the University of Lyons, France. You may be sure, however, that I shall be thinking of you on this day, and wishing every possible success to the deliberations of the Conference. I am entirely convinced that no voluntary organisation in the United Kingdom is at present carrying out work of greater importance than yours, at the time in world history at which we now find ourselves. Let me try in this brief address to explain why I think this. It is more important that I should take this opportunity of raising very broad and long-term issues rather than speaking mainly of organisational matters such as the detailed tasks of our Association, important though I think they are.

It is advisable that we should view the present world situation, especially in its relevance to Asia, with an adequate historical background. Three or four centuries ago Europe experienced a series of fundamental changes (the Renaissance, the Reformation, and the Rise of Capitalism) which ended the feudalism of former times. But the bureaucratic feudalism of China, and its related forms in other countries, did not undergo this change. As we can now see, one of the most important features of this change in Europe was the rise of modern science and technology, which gradually



led to a previously unheard-of and unimaginable power over the forces of Nature. The enormous superiority of European weapons in the past couple of centuries led to the growth of a psychology of dominance, and a movement of imperialism, which has now been inherited in intensified form by North America. But the impact of western capitalist civilisation upon China and other Asian countries has inevitably brought it about that they too have determined that they must share in the vastly higher standards of life which modern science and technology has placed at the disposal of modern man. Side by side with this determination there has grown up a political self-consciousness which rejects all idea of any innate superiority of Europeans or Americans, and which demands as an inalienable right the establishment of self-government, and intercourse with the occidental peoples upon a friendly and equalitarian basis. The technical superiority of the west is a matter of only three centuries of history; if you go back three centuries more, you find that Europe was very backward as compared with China, so that Marco Polo, for example, thought Hangchow a paradise compared with any European city known to him. But in our own time, the peoples of Asia have been faced with the problem of the method of their industrialisation. Must they pass laboriously through long periods comparable with those of the Factory Acts and the "dark Satanic mills" of our own country, or could they take a leap forward, and by treading the path to socialism, ensure that their industrialisation would be carried out with due regard to the welfare of the working people? The Chinese Revolution, which has brought Chairman Mao Tse-Tung and his colleagues to power in Peking, is the decisive answer of the Chinese people to this question.

It may be said that the western nations have been fully aware of the importance of aid to the under-industrialised countries. The "Fourth-Point Program" of the United Nations, which disposed of some \$20 million, and the British Commonwealth's



"Colombo Plan" which envisages the spending of \$5.2 billion in six years (mostly on the Indian sub-continent), have been described in recent issues of International Conciliation. These sums are not very large in comparison with the need. Moreover, Asian countries have been very suspicious of them in the belief that political strings are likely to be attached, and that they are disguised arrangements for bringing profits to the pockets of western capitalist corporations. If the Soviet Union were participating in these programs, this fear would not have arisen. Criticism has also centered on the notorious failure of some of the technical missions already sent out, such as that to Iran, which tried to impose American methods on the Persians, regardless of their customs and temperament. Western technologists, too, have not been willing to adapt their proposals to the early stages of industrialisation in Asian countries, but have often insisted on production methods only suited to later stages. The much-advertised Marbial Valley Project in Haiti, though in a part of the world very near geographically to the great wealth of North America, has been pronounced a failure. What then can East Asia expect?

We may say, then, that the industrialisation of Asia, with all that that implies for the raising of the standard of life of the Asian masses towards those levels which would be regarded as minimal, even by impoverished Europeans, will be looked back upon by future historians as one of the most fundamental features of the historical period through which we are now living. Surely future history will be largely determined by the way in which the peoples of the west respond to this legitimate struggle. This is the context in which we have to view the systematic destruction of embryonic Korean industrial plants by the air forces of the most highly industrialised country in the world. Taken at its lowest estimate this is the infliction of a wound which will be very difficult to heal. Will the legalistic arguments by which, with indecent haste, the delegates



of the nations at Lake Success allowed themselves to be convinced last year, seem very strong to historians of the future, taking an overall survey ?

For many months past, the work of our Association has been partly concerned with efforts, not only to support the legitimate aspirations of our Chinese friends, but to prevent any extension of the war in East Asia. But now this danger seems worse than it has ever been. Writing in the last days of March, one opens one's newspaper to find (in a column next to some information about an aeroplane, not British, with the symbolically significant and sinister name of "Globemaster") a statement from the American military potentate in Japan that "Communist China must realise that she cannot hope to stave off attack by the United Nations". One is indeed glad to find that the leading article overleaf gives a strong warning to the American forces not to cross the Parallel (though what will have happened about this by the time of your meeting, no one can say). But emissaries from the Formosa puppet government recently in this country have been talking openly about their expectation of an early expeditionary force to the Chinese mainland, backed, as it would certainly have to be, by American air might. A few days ago an American correspondent close to General McArthur published in Japan a circumstantial account of preparations already in hand for the establishment of a "Second front" on the Chinese mainland. All this is done in the name of the defence of capitalist democracy against communism, and such indeed it is presumably supposed to be by very large numbers of people of good will in this country. It should be the urgent objective of our Association to disabuse them of this idea. How distorted it is can only be fully appreciated if one takes the trouble to understand the Asian point of view, and its proper historical background. To the average Chinese, as well as the average Korean, Indo-Chinese, Indonesian, Malay, Burmese, and so on, the whole current mobilisation of the West



seems directed, not so much against communism, as against the rising upsurge of political consciousness, the national movements of liberation, and the struggle for industrialisation and the raising of living standards, of all the Asian peoples. In other words, the western peoples appear to be fundamentally jealous of the rise of the under-privileged and under-industrialised countries. How can the westerners, to judge from their actions, be acquitted of a determined persistence in colonialism and imperialism? Their attitude seems to be summed up in the expressive word "gooks". It is right that every American should have a car and a refrigerator, and it is right that every gook should be ground down into the mud of the rice-fields where he belongs. If this attitude is not corrected, the seeds of generations of hatred will have been sown.

We cannot too much emphasise that the extension of the "cold war" mentality to Asian affairs is the critical transition point. Measures taken by western countries against their own communists or by eastern European countries against reactionaries, wrangles between the powers in Berlin, propaganda and counter-propaganda from Washington and Moscow, all this is on one side of the world and for the present purpose does not matter; the decisive point is reached when the occidental world extends its quarrels to Asia and driven by its own hysterical fears, attacks the Asian-wide movement of national liberation and modernisation. Then it is that we find all considerations of morality and even of political prudence laid aside in the interests of strategic plans. This has been most strikingly put in the last issue of the French progressive Catholic journal Esprit, which refuses to identify social and human progress with either European humanism or the American way of life.

It may be urged that the uneasiness of westerners at the great resurgence of China is due to understandable fears of another Pearl Harbour. While it is true that most westerners cannot distinguish former Japanese Shinto-Fascist imperialism



from Chinese civilisation and culture, it is high time that they educated themselves to do so. The three-thousand-year-old anti-militaristic tradition of China is not contradicted by the strength which the new communist revolution has given to the Chinese in their conviction of serving a just cause. Chinese culture has nothing in common with Japanese capitalist imperialism, now being assiduously underpinned by those who a short while ago considered the use of the atomic bomb justifiable to destroy it.

It is natural enough that as a scientist I cannot forget the technical situation. Unfortunately, however immoral and basically un-Christian the occidental attitude may be, the west does still dispose of technical facilities and industrial potential far greater than that of Asia. Hence the harrowing equation for which observers have been seeking solutions ever since the beginning of the war in Korea - politically conscious manpower versus enormous industrial potential and high technique. The question is a very complex one, and perhaps the most important in our present situation. I should like to dwell on it for a moment since I feel that it has particular relevance to the work of our Association. It comes home to me with particular force, because I remember so clearly, in the early stages of the war against Nazi-Fascism, taking much pains to calculate the relative industrial potential, and concluding that in the end, and barring certain chances, the Nazi-Fascist Axis simply could not hope to win. Among historical parallels the American Civil War has often been taken as an example of the decisiveness of the factor of industrial potential, which was on the side of the North.

This is the relevance of the statement made in a well-known weekly journal some weeks ago that it looked as if the United Nations were being mobilised for the crushing of all movements of national independence and welfare in Asia and the other non-industrialised parts of the world. Colonialism and



imperialism had become internationally organised. That the spectre of colossal manpower has already had considerable psychological effect was noticeable in another slang word recently seen in an American journal - the "nogoodniks", which, when hit, burst into four soldiers exactly the same as the first. But against this we have to set that vast array of engines of war which industrial mass-production no less than scientific ingenuity created during World War II; e.g. the proximity fuse, shaped plastic explosives, the radar detector, jellied petrol, and above all, bacteriological warfare, and the atomic energy bombs. Could we crystallize our apprehensions into a single phrase by the suggestion that this immense apparatus of domination, brought into being by the efforts of right-thinking scientists and engineers in the war against Nazi-Fascism, is now to be used to impose upon the world a new fascism, carrying the banner of democracy without a trace of its true spirit, and destined to perpetuate the material superiority of the white race ?

This is the nightmare which our Association must prevent becoming stark reality. Of course the situation is not clear-cut. Of course Asia is not entirely devoid of industrial potential, as I know well enough myself from the underground arsenals of China which it was my duty as a friend and ally to visit during World War II. Of course the Soviet Union, the firm, if passive, friend of all Asian aspirations, has great industrial strength. Of course there are thousands of American liberals who loathe the lamentable Asiatic policy of their present Administration. Of course there are thousands of men and women, whether Christian or otherwise, in our own country, and in other western European countries, who can be brought to see the utter immorality of current western dealings with the Asian peoples. Here then is surely one of the most basic tasks of our Association. As men and women living within one of the most highly industrialised countries of the world, does

not a heavy responsibility rest upon us to increase our efforts tenfold to try to make our fellow-citizens understand the present posture of Asian-Western relations ? To prevent the Americans raising all Asia in a justified holy war against occidental greed and selfishness, His Majesty's Government must act far more firmly than hitherto. To prevail upon it to do so, is our task and our opportunity.



CHINA

LECTURES ON THE HISTORY OF SCIENCE, SCIENTIFIC THOUGHT, AND  
TECHNOLOGY IN CHINA.

Joseph Needham.

Michaelmas & Lent Terms  
1950-1951.

Michaelmas: The Development of Scientific Thought.

- 1) SKETCH OF CHINESE HISTORY  
Prehistory and the Shang-Yin kingdom. Chinese feudalism, the Chou period and the Warring States. First unification in the Chhin empire. The Han. First partition (the Three Kingdoms), and the key economic areas. The literary Thang and the scientific Sung. Mongol and Manchu domination.
- 2) HISTORICAL CONTACTS BETWEEN EAST AND WEST  
Conditions of travel of scientific ideas and techniques between China and Europe. Bronze-age continuity. Development of overland and maritime trade routes. Chinese-Indian and Chinese-Arab contacts.
- 3) ANCIENT CONFUCIANS AND TAOISTS  
Confucian rationalism as a factor favourable to science, overweighted by Confucian concentration on human social life to the exclusion of other interests. The fundamental importance of Taoist naturalism for Chinese science; its relations with alchemy, pharmaceutical botany, etc. Political attitudes of Confucians and Taoists. Relations of magic and science in ancient China. Taoist naturalism vitiated by mistrust of reason and logic.
- 4) ANCIENT MOHISTS AND LOGICIANS  
The efforts made by the followers of Mo Ti to work out a logic suitable for natural science, perhaps stimulated by their interest in fortification technology. The Chinese "Eleatic" paradoxes. The paradox that those who attempted to lay the foundations of a logic for the sciences of Nature were themselves much less interested in Nature than the Taoists. The paradox that ancient Chinese logic foreshadowed Hegel without passing through the stage of Aristotle.
- 5) ANCIENT NATURALISTS AND THE INDIGENOUS PATRIMONY OF SCIENTIFIC HYPOTHESIS  
Tsou Yen and the theories of Yin and Yang. The origin and development of the five-element doctrines. The role of the symbolic correlations (Correlative Thinking). The role of the Book of Changes.
- 6) SCEPTICS, BUDDHISTS, AND LATER TAOISTS  
The sceptical tradition, centering on Wang Chhung (mid.1st.cent.AD), one of the greatest elements in Chinese thought. What it had to contend with (the pseudo-sciences; divination, astrology, geomancy, etc.). What it ended in (a truly scientific textual criticism much anterior to that of Europe).  
Introduction and effects of Buddhist thought. Failure of the concept of laws of Nature to arise from the "law" of Buddhist cosmology. The illusoriness of the visible world a deeply anti-scientific doctrine. Continuation of Taoist traditions; Ko Hung and Than Chhiao.
- 7) MEDIAEVAL NEO-CONFUCIANISM  
The "Thomistic" synthesis of Chinese thought, stimulated by Buddhism, and resolving the antithesis of Taoism and Confucianism. Its profoundly scientific character. Similarity to Whiteheadian philosophy of organism. Contemporaneity with the flowering period of Chinese science in the Sung.



- 8) THE DIFFERENTIATION OF THE CONCEPTS OF JURIDICAL AND SCIENTIFIC LAW IN CHINA AND THE WEST  
How did (juristic) natural law, and (scientific) laws of Nature, differentiate from their common roots in Mediterranean-European civilisation? Brief account of Chinese law, and the role of the School of Legalists. Dislike of the Chinese for positive law. Chinese terms for law, as applied to man and Nature. Roles of theological conceptions. The Chinese world-view one of co-operating organisms following their intrinsic natures - the European world-view one of beings compelled to co-operation because of statutes enacted by a divine law-giver.

Lent: Some of the Achievements and Positive Content of Ancient and Mediaeval Chinese Science and Technology

1) MATHEMATICS

Numeral Notation, Place-Value and Zero. Theory of Numbers (magic squares). Mechanical Aids to Calculation. Artificial Numbers. The Chinese genius characteristically algebraic; no spontaneous development of deductive demonstrative (Euclidean) geometry. Comparison of the development of mathematics in China and the West.

2) ASTRONOMY, METEOROLOGY, THE EARTH SCIENCES AND CARTOGRAPHY

Chinese astronomy essentially equatorial and polar, not ecliptic and heliacal. The origin and development of the 28 divisions of the equator. Development of astronomical instruments down to the Mongol period. Chinese systematic positional astronomy earlier than European. Recognition and systematic observation of novae, comets, meteor showers, auroras, etc. etc. Sunspot cycles. Cosmological interpretations.

Recognition of the rain cycle. Raingauges. Knowledge and theory of tides.

Chang Heng and the first seismograph (1st.cent.AD) Chinese quantitative cartography. Phei Hsiu as the successor of Eratosthenes, Hipparchus and Ptolemy. The hodometer and the "south-pointing chariot". Travellers, from Chang Chhien to Hsu Hsia-Ko.

Recognition of the true nature of fossils from the Thang time onwards.

3) PHYSICS AND ENGINEERING

Optics in the Mohist Canon; burning-mirrors. The discovery of the directive property of the lodestone. The "spoons" of the Han; needles in use probably from the Chin onwards; compass applied to geomancy in the 5th cent. A.D. and to navigation at least from the 11th. (first European mention in the 12th.)

Machinery for grinding, pounding and water-raising. Driving-belts. Paddle-wheels. Bridges and suspension-bridges. Wheelbarrow and sailing-chariot.

The technology of animal power (the efficient animal harness).

Mining. The discovery of the technique of deep drilling. Brine and the early use of natural gas. Early achievement of the technique of iron-casting. Early use of coal.

Other applications of physical principles. Felting and the discovery of paper. Printing from the 9th.cent. AD onwards. Transmission of paper and printing to Europe.



4) TEXTILE TECHNOLOGY

Ancient domestication of the silkworm, and the development of China's most famous and characteristic industry. Hemp the other ancient textile; cotton a later introduction. Winding machinery and the spinning-wheel. Ancient types of loom. The invention and use of the drawloom in the Han.

5) ALCHEMY AND CHEMISTRY

First indications of alchemy in the Chhin and early Han. Wei Po-Yang; the beginnings of alchemical literature in the Later Han (2nd.cent.AD). The problem of the relations of Chinese and Western alchemy perhaps largely one of terms; in so far as the search for the medicine of immortality was the goal of later European alchemists this was Chinese, mediated through the Arabs.

Chemical technology. Gunpowder developed in the Thang and employed in warfare early in the 10th.cent.AD. Applications of empirical chemistry in ceramics. Special character of Chinese fermentation industries.

6) THE PLANT SCIENCES

The great tradition of pharmaceutical botanies (Pen Tshao). Development of the classification system.

Characteristics of Chinese agriculture. Invention of the biological control of insect pests. Inventions such as the seed-drill plough. Secondary rural industries (insect wax, lacquer, vegetable oils etc.) Forestry and economic trees.

7) THE ANIMAL SCIENCES

Zoological classification in a non-alphabetic language. The specific monographs of the Sung. Animal breeding. Fisheries.

Anatomy, Physiology and Embryology. Dissections in the Han and Sung. Traditional medical physiology. Sung Tzhu and forensic medicine.

Pharmacology; provisional assessment of the value of the drugs in the traditional pharmacopoeia. Early use of mineral remedies.

Emphasis on pulse-observations, acupuncture, and cautery, in traditional Chinese medicine. Variolation the precursor of vaccination. The backwardness of surgery and the status of the medical practitioner.

8) THE SOCIAL AND ECONOMIC BACKGROUND OF CHINESE SCIENCE AND TECHNOLOGY

What was implied in the passing over of Chou feudalism into the feudal bureaucratism of the Han and later periods. Inhibition of capital accumulation by merchants and its application to industrial ventures.. Perpetuation of the gulf between manual and mental work. Two problems to be solved (a) why was Chinese feudal-bureaucratic society more favourable to technical invention, though not to abstract and synthetic scientific thought, than the society of the ancient Mediterranean world or that of feudal Europe ? (b) why was Chinese feudal-bureaucratic society incapable of giving rise spontaneously to modern mathematized natural science, such as that which arose in post-Renaissance Europe ?



# CHINA RECONSTRUCTS

VOL. IV. NO. 9

SEPTEMBER 1955

*See article on  
China's mission  
(history) etc.*







The Indian Cultural Delegation, which was enthusiastically received everywhere in China during a two-month tour, arrives in Peking. In the foreground is A. K. Chanda, India's Deputy Minister for External Affairs, who headed the delegation.



# To Our Readers

## In Tune with Our Friends

THIS past summer, people in China had the pleasure of being entertained by some of the best singers and dancers of India and the Mongolian People's Republic. Besides the great numbers that attended the performances, millions heard them on the radio or saw them on newsreels. The press printed photographs and wrote many articles to acquaint readers with the art of these neighbouring lands—which will never again seem strange or far away.

For six years now, together with the uncovering of China's own multi-national cultural heritage, the culture of many other countries has become widely known. On the very day our People's Republic was founded, the first Soviet ballet company ever to visit China arrived in Peking. Since then, over 3,000 performers from 13 countries have made China tours. They included ballet and theatre companies, symphony orchestras and chamber music groups, folk music and dance ensembles and some of the world's foremost soloists—from the homelands of Beethoven and Tchaikovsky, Chopin and Dvorak. They have performed in our best theatres and halls, in stadiums seating tens of thousands, in factories, farms, universities and army barracks.

General have seized Not long ago, the ballet *Swan Lake*, al Theatre during whenever our young solely to do the de e Hungarian Na heard from the nsemble resound hich ridicules a hearts when per- Group. It is now

learned Chinese their repertoires. e-tung, is always as in translation le of the country rklng virtuosity pany performed u, evidence both i respect for our

abroad—to the Burma, Indonesia sts of our opera nesia.

ce, our own cul- e become broad- and dance each ding and human and the supple-

These folk songs from China sent with this issue, are our small contribution to a beneficial process that will become wider and wider.



## CHINA RECONSTRUCTS

A Monthly Magazine

# CHINA RECONSTRUCTS

VOL. IV NO. 9 SEPTEMBER 1955

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(SOONG CHING LING, CHAIRMAN)

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#### FOLK SONGS FROM CHINA

FRONT COVER: *Passengers descend from a Chinese airliner after a flight from Shanghai to Peking.*

BACK COVER: *The Wu Ta Su (Five-Pagoda Temple) in the suburbs of Peking. It was built in the early fifteenth century in the Indian architectural style.*

Photos by Chang Shui-cheng

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The Indian Cultural Delegation  
China during a two-month tour.  
Chanda, India's Deputy Ministe

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CHINA RECONSTRUCTS



# To Our Readers

## In Tune with Our Friends

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CHINESE artists, students and the people in general have seized the opportunity to learn from the visitors. Not long ago, the Peking Dance Institute put on scenes from the ballet *Swan Lake*, a result of training by the Moscow State Musical Theatre during its long sojourn in China earlier this year. Whenever our young people get together for a good time, they are likely to do the delightful *Bottle Dance*, brought to China by the Hungarian National Folk Art Company. The fine songs we heard from the Soviet Army Red Banner Song and Dance Ensemble resound everywhere in China. *The Little Cuckoo*, which ridicules a young man who wanted a rich bride, won all hearts when performed by the Polish Mazowsze Song and Dance Group. It is now a favourite song among our schoolgirls.

TOURING foreign artists, on their part, have learned Chinese songs and dances and incorporated them in their repertoires. *The East Is Red*, a folk song in praise of Mao Tse-tung, is always performed by visiting choirs—in Chinese as well as in translation—and sometimes in new arrangements in the style of the country concerned. Really amazing to see was the sparkling virtuosity with which the Soviet National Folk Dance Company performed the difficult Chinese acrobatic dance *San Cha Kou*, evidence both of the hard training they put in and their warm respect for our culture.

China, in her turn, has sent many artists abroad—to the Soviet Union and People's Democracies, India, Burma, Indonesia and Scandinavia. As we write, outstanding artists of our opera are touring France, Belgium, Germany and Indonesia.

THROUGH the exchanges that have taken place, our own cultural horizons, and those of other peoples, have become broader than ever before. To sing each other's songs and dance each other's dances is good for international understanding and human happiness. The songs we print in alternate issues, and the supplement *Folk Songs from China* sent with this issue, are our small contribution to a beneficial process that will become wider and wider.

# CHINA RECONSTRUCTS

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#### FOLK SONGS FROM CHINA

FRONT COVER: *Passengers descend from a Chinese airliner after a flight from Shanghai to Peking.*

BACK COVER: *The Wu Ta Su (Five-Pagoda Temple) in the suburbs of Peking. It was built in the early fifteenth century in the Indian architectural style.*

Photos by Chang Shui-cheng

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The author at the controls of his plane.

## Our Civil Airlines: A Pilot's View

PIEN JEN-KENG

CHINA'S domestic civil airlines, passenger and freight, fly some 9,500 miles of regular routes. In addition we have three international lines to the Soviet Union, which connect with others to various European capitals. The domestic network is steadily growing, and I believe that Chinese planes will soon be going to countries in Southeast Asia.

These lines have a splendid safety record. Since 1950, when the Civil Aviation Administration of China was established, the number of passengers flown has increased more than fourfold, the amount of freight more than eightfold. Yet there has not been a single casualty or loss of cargo. Most important of all, our civil aviation really serves the country and people.

As a seasoned pilot who has flown 9,500 hours without accident, I am proud to be an officer in the people's airlines. It is a very different status, and feeling, from that we used to have in the old American-controlled "China National Aviation Corporation" (CNAC), which employed me for twenty years under the Kuomintang.

My new career began in 1949, soon after the New China was born. The proclamation of the People's Republic found me in Hongkong. The CNAC, which had ordered its fleet there, had begun to fire Chinese personnel. It was being urged by the Kuomintang to move the rest to Taiwan, to open a new route to Malaya. The only

way we could keep our jobs, it was made plain to us, was to break forever with our country and the way our people had chosen. Even so, we faced the risk of being laid off in foreign parts. We are Chinese, and love our homeland. To a pilot, flying is his life. When the People's Government invited us to come back and continue in our profession, I and some of my friends made our decision.

On the chilly evening of November 9, 1949, twelve planes bearing the insignia of the CNAC and CATC (the Kuomintang's "Central Air Transport Corporation") landed in liberated Tientsin after a long flight from Hongkong. Their pilots, of whom I was one, were warmly received. We all stated our willingness to help build civil airlines in New China. Within nine months I was flying the first post-liberation air route, between Tientsin and Chungking.

### The Way Things Were

Since my own life story is tied up with that of China's civil aviation, it may be of interest to tell them in connection with each other. The CNAC, the largest airline in old China, was a joint concern of the Pan-American Airways and the Kuomintang regime. Though the U.S. side had invested only 45 per cent of the capital at the outset, and its share later dropped to 20 per cent, it controlled policy and the responsible posts. The salaries of some Americans were about 30 times what we Chinese employees were getting!

I joined the CNAC as a 17-year-old ground-crew apprentice in 1930, a year after it was set up. In 1942, when I was a mechanic, our main base was transferred to Dum Dum Airfield, Calcutta. I'll never forget how the American mechanics sat drinking coca-cola in the shade, swearing and cursing at us as we sweated in the hot Indian sun. All Chinese, not only the workers, were regarded as underlings with no feelings. Once the Chinese general manager came down on an inspection tour and gave a talk to the staff. Something he said annoyed the operations manager, Charles L. Sharp, who was nominally his subordinate. So Sharp ordered the whistle blown and we had to get back to work,

leaving the general manager with his speech unfinished.

Besides power, the Americans enjoyed endless opportunities to make money. Everything used by the CNAC, from aircraft to toilet paper, was bought in the United States. Pan-American Airways took a 5 per cent commission on each purchase. Americans who joined the corporation in rather poor circumstances turned into rich men in a remarkably short time. William L. Bond, for instance, came to Shanghai with nothing, but ended up with a mansion and a yacht of his own.

### I Become a Pilot

During the Second World War, the CNAC got very lucrative contracts to fly U.S. army supplies from India to China. The sudden boom brought a need for more pilots. Most qualified Americans were in war service, so Chinese were now picked for flight crews. As a mechanic of ten years' standing, known to be "quiet and obedient", I was made a co-pilot. This seemed, at the time, a great opportunity. But the only job given me was to gear up or down in take-offs and landings. The American captains hardly spoke at all. Once, in the messhall, a pilot sneered at me, "You Chinese eat like dogs". I had to swallow the insult for the sake of my job.



Map by Mr. Wei-huan

Often I was put on several successive flights without rest, spending 36 hours at a stretch over the dangerous Himalayan "hump". But despite the fatigue and danger I was determined to be a pilot, put all I had into the job, studied books on aviation and asked our few Chinese pilots to help. Three years later when a pilot class was started, mainly for Americans, I and two other Chinese were put in it for window-dressing.

But the instructors were not interested in teaching us. While the Americans were checked out as highly-paid captains in a month's time, we remained as we were. After repeated protests, I got a promise of more attention, but even then the American pilots volunteered no information and hardly deigned to answer my questions. I got my pilot's certificate only in 1945. Long afterwards I saw my picture in an American magazine, as evidence of how the U.S. was "helping" us Chinese to be pilots. It made me very angry.

After V-J Day, as a passenger pilot, I came to know what kind of people I was really serving. While the Kuomintang plunged our country into civil war and millions starved, I carried plane-loads of Kuomintang officials and profiteers with their wives and concubines, and foreign tourists who had plenty of money and did no work.

In 1946-47, we made 44 flights to ship goods for the private speculations of the Kuomintang minister T. V. Soong—as a "favour" for which the corporation charged nothing. The CNAC also bought a luxurious special DC-4 plane, costing over a million American dollars, for the exclusive use of Chiang Kai-shek. On the eve of



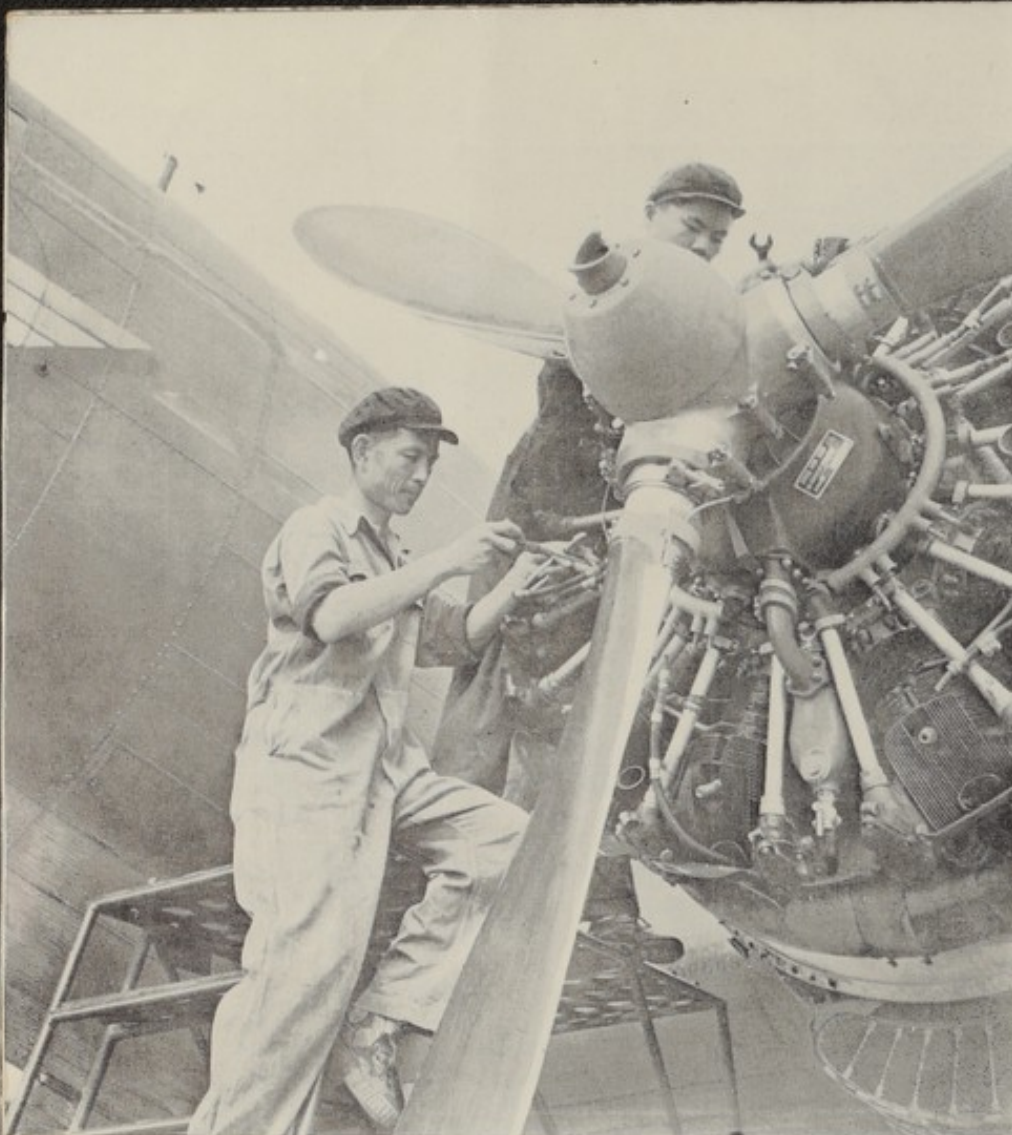
A passenger plane leaves the Shanghai airfield for Peking.

CHINA RECONSTRUCTS

SEPTEMBER, 1955

3





A routine engine-check.

liberation, we were sent to parachute munitions and provisions to besieged Kuomintang troops.

The profits of the CNAC were banked in America. Very little of its income was spent in China for airfields, terminals and employee accommodation. When the corporation finally fled to Hongkong, valuable equipment was taken away or destroyed—so it would not remain for the Chinese people.

The other Kuomintang airline, the CATC, was just as predatory—and the Civil Air Transport, headed by the American adventurer Claire Chennault, was perhaps the worst of all. So much for the civil aviation of the old, semi-colonial China, which I knew from beginning to end.

#### Starting Anew

We old CNAC pilots had brought over some planes. But before they could start flying, the ground

installations had to be put in shape. It broke our hearts to see the runways and buildings of many city airports, which had been bombed by Chiang Kai-shek's forces as they fled. Many were littered with blown-up planes.

Local people's governments gathered labour and materials for basic repairs. Thousands of former employees of the Kuomintang aviation corporations, now with the Civil Aviation Administration of China, cooperated in restoring facilities. In Shanghai, 16 partially destroyed planes were re-assembled. These helped us to tide over the period before we got new ones.

Our flights were mostly to carry freight. Industrial equipment, medical supplies, books and newspapers were urgently needed in many parts of the country. No railways, for example, link Peking

with southwestern cities like Chungking or Kunming. Without air services, it would have taken long weeks for even the most urgent freight to reach them by land and water.

Later, a fleet of transport planes and ample fuel were purchased in the U.S.S.R. From 1952 on, new air routes were opened each year. The increased staff needed was provided by promoting experienced co-pilots to captains. We also trained students and workers as new pilots. Ground-crew schools were set up in Chungking and Shanghai, some of the trainees coming from the national minorities in the southwest. Old ground and flight crews were sent on temporary duty with the Sino-Soviet Joint-Stock Civil Aviation Company, to learn from Soviet experience.

#### Sino-Soviet Lines

This Sino-Soviet company, which was founded in 1950 and became a solely Chinese enterprise last year, played a very big role in our progress. For five years it ran our international airlines, as well as domestic routes in northeast and northwest China, at a time when we could not carry the load ourselves. In the difficult period of economic rehabilitation, its planes brought experts, blueprints and urgently needed supplies from the Soviet Union, as well as delegations from all over the world. Profits and costs in this common enterprise were shared equally between the two countries. Leading posts were alternated every two years between Soviet and Chinese representatives.

Hwa Chu, an old friend of mine from the CNAC, served as deputy chief radio engineer of the Sino-Soviet lines. He was full of praise for the respectful attitude of the Russian staff toward their colleagues and superiors, Soviet and Chinese alike, and their concern for China's interests. To illustrate this, he told the story of what happened to the ex-CNAC mechanic Han Fu-sheng. Trained under the Americans, who always regarded the replacement of equipment as a source of profit and never hesitated to authorize it, he



asked a Soviet engineer for a new part as a substitute for one that had been damaged. The latter, after checking up, criticized him straight to his face. "Don't you know that these parts are bought from the Soviet Union and cost your country money? Why do you want to replace something that can be repaired?" Afterwards, he helped Han to fix the part.

In the years of its existence, the joint-stock company trained a great many Chinese pilots, mechanics, signalmen and administrators. At one time, its Soviet experts taught no less than 24 courses, open to students from all Chinese airlines. Whenever a qualified Chinese became available for a post held by a Soviet citizen, the latter returned home, his job done.

On December 31, 1954, all Soviet shares in the company were formally turned over to China. Its enterprises have now been absorbed into our Civil Aviation Administration, and are all managed by Chinese.

#### My Work

I myself, very shortly after my return, was appointed deputy head of flights in the administration. Later I became chief of our passenger and freight flying crews.

**A Soviet pilot on the northwestern line of the former Sino-Soviet Civil Aviation Company instructs his Chinese co-pilot.**



All this time I have continued to work as a pilot.

The passengers we carry are interesting and worthwhile people—factory workers, miners, engineers, government personnel on various missions, Soviet experts helping in our national construction and friends from abroad.

I have carried, among others, Mr. Attlee and the British Labour Party delegation, Premier Nehru of India and his daughter, and Premier U Nu of Burma. Mr. Nehru wrote in our "Suggestion and Criticism Book", which is carried on all Chinese planes: "We had an excellent journey on this aircraft. We were made comfortable and looked after very well." The head of a Pakistani delegation noted: "For perfect take-offs and smooth landings, the Chinese pilots are second to none." We have simi-

lar comments from French, Indonesian, Latin American and other travellers.

Like everything else in China, the civil airlines are geared mainly to the needs of economic development. We ship precision tools and emergency equipment for factories, engineering drafts and blueprints, and other important cargo. During the floods last year, we carried pumping equipment which saved non-ferrous metal mills in the southwest from inundation, as well as medical supplies for the affected areas. Once we flew a full load of silkworm eggs all the way from Shanghai to Kashgar in southern Sinkiang province, 3,906 miles away, bringing fine breeding sheep and milch cows on the return trip. Fish fry and guinea pigs are especially delicate passengers, requiring the greatest of care.

After the Constitution was passed last year, we carried copies of it in the Uighur and Mongolian languages to the remote borders of our country. Matrices for printing the *People's Daily* and other popular Chinese newspapers and magazines are regularly distributed by air, as are many films.

#### Special Services

A lot of my old colleagues, good and experienced pilots, are working in our administration's special service departments.



Surveying equipment loaded at Shanghai for Urumchi, Sinkiang province, 2,706 miles away.



Since 1952, we have sent out daily forest patrols each spring and autumn. In Inner Mongolia and the Greater and Lesser Hsing-an (Khing-an) Mountains, planes watch for fires and help fight them, serve as directing points and drop equipment and supplies. Now we are planning to train parachutists for forest-fire duty. My friends who fly this service have become good hunters too, because they are based where game is plentiful.

Our photo-survey service has mapped huge areas accurately, and found some stands of fine timber that were previously unknown.

Crop-protection services fight insect pests by means of aerial spraying. In 1954, about 15,000 acres of farmland in Kiangsu province were saved from locusts in this way. This spring we tried something new: aerial scattering of phosphate fertilizer on the Lutai State Farm, which is expected to increase the harvest by a quarter or more.

Geological survey planes equipped with magnetometers fly over the northwest to locate underground ores. Some 6,210 square miles were covered by them last year. This year we are covering an area ten times as great.

In the old CNAC, Chinese crews felt they should make their wills when they had to fly under American captains who drank. I remember one, a fellow called York, who always carried a hip-flask full of whiskey, which he consumed in the air. York finally crashed while intoxicated, killing himself and many innocent passengers.

While not all the U.S. pilots were so reckless, they generally paid very little attention to the instructions of the dispatcher. This was the main cause of a frightful accident—the crash of three CNAC planes in Shanghai on Christmas Eve, 1946. The reason: all the pilots were anxious to get to the city early to celebrate and some, perhaps, had celebrated a little already.

### Flight Safety

Today such things just don't happen. The Soviet passenger and cargo planes we fly have fine, easily-handled safety devices. Radio beacons and equipment for "blind landings" have been installed everywhere. The Soviet civil aviation regulations, embodying many years of experience, have been translated and made standard. Aircraft maintenance is in the hands of a highly-competent staff who work under strict procedures. Flying personnel co-

operate with ground crews by reporting the condition of the plane after each flight, and sometimes helping in their work. In the past the pilots, including the Chinese ones, would think it beneath their dignity to talk to the mechanics.

In our safety emulation drive, all air crews have obligated themselves to do the following things: 1. Work out a detailed plan of each flight in advance, taking weather reports and the state of the aircraft into account—with each person having his own assigned job in case of different types of emergencies. 2. Check their planes strictly before every take-off. 3. Follow the instructions of the ground control.

At weekly summary meetings, which all flying personnel attend, every flight is reported and discussed. Shortcomings are fully analyzed by us and the Soviet experts, and ideas for remedying them brought forward. Lectures are given on how to handle aircraft in bad weather of all kinds, winter or summer. We pre-liberation pilots knew nothing of this kind of procedure, which is a tremendous factor in reducing hazards and raising standards all round. Some of us had worked side by side for ten years without ever sharing experiences.

Fliers in the old days were often rowdy, drunken, and more interested in smuggling than in doing a good job. Today we consider such behaviour unworthy, and sloppiness in flight is seriously criticized or punished. There is friendship instead of rivalry and discrimination between different air crews, and between them and the ground personnel. These things too show in the safety record.

Whatever our position, we never stop studying. Recently a batch of brand-new passenger planes, of the 1955 model, arrived from the Soviet Union. Now I am learning from an experienced Soviet pilot how to operate this kind of plane, which will soon be flying on our domestic and international lines.



Spraying locust-infested fields in Kiangsu province.





Mei Lan-fang in a dance from the Peking opera, *Chin Shan Ssu Temple*.

# India's Art— and China's



CHANG JEN-HSIA



Indrani Rahman in the *Bharat Natyam* dance of southern India.

THE many thousands of Chinese people who saw the richly varied programmes presented by the Indian Cultural Delegation this summer were delighted at the superb mastery of the visiting artists, and surprised at finding so much that was near and familiar. The delegation, which included some of India's best dancers and musicians, played in many parts of our country from north to south and from east to west. It brought striking proof that though India was under alien rule for centuries, her superb and ancient national culture has retained its roots in the people and is interwoven with their life.

### Historic Associations

Here I shall dwell on the historic associations which its fine performances awoke in Chinese minds. Some of the best works of painting and sculpture that have come down from our ancestors show a close affinity with Indian art. The polished and graceful movements of the visiting dancers; the ornaments and bells on their wrists, arms and ankles; the instruments of the musicians and their cross-legged posture when playing—all these we know from the work of Chinese artists of 1,500 years ago.

It was also interesting to find unsuspected parallels between the south Indian Kathakali dances and our own classical opera as seen today, despite the differences between the two media. This is true of the general stage effect, the painted faces and the heavily ornamented, brilliantly coloured costumes. The expressive poses of Kathakali too are similar to those in Chinese opera, though far more developed in the range of movement. Finally the Kathakali, like the Chinese classical opera, was originally confined to male performers, though this feudal restriction has now disappeared from both.

As most people know, the *mudras* or hand-gestures of the *Bharat Natyam* dance of south India form an intricate language of their own. In Chinese operatic acting, the hands, particularly in the female roles, also play an important though simpler part (they are often concealed in long sleeves with which the gestures are made). The "orchid" hand-gesture of the Chinese opera has something of the expressive and restrained character of the Indian *mudras*.

The drum has always occupied an important place in our classical

operatic music. As an accompanying instrument to dancing, it was considered "the leader of all sounds" in ancient China. In India the drum finds a parallel use in creating atmosphere and in supplying the beat for dancers, singers and the players of other instruments.

### Contacts in Music

Seeing the Indian artists took us back to the life described by the poets of the Tang dynasty (618-907 A.D.), such as Li Po and Po Chu-i. This is only natural. In the first eleven centuries A.D., cultural contacts between China and India were fairly constant and contributed to a great flowering of the arts.

Chinese music in those times was tremendously enriched by elements adopted from the "Western Regions" (the present province of Sinkiang and parts of Central Asia). These influences, which draw much from India, came in the wake of the spread of Buddhism and the development of trade routes. They have remained part and parcel of Chinese music ever since.





Orchestra of the Tang dynasty (618-907), from a contemporary mural in the Tunhuang caves. On the left, musicians playing the *kunghou* and two types of *pipa*.

Copied by Tuan Wen-chieh

The harp-like *kunghou*, for instance, was introduced into China as early as the Han dynasty (206 B.C.—220 A.D.). How popular it was is shown by the description by a Han poet of the girl Liu Lanchih, who learned "to weave at 13, cut clothes at 14, play the *kunghou* at 15 and read the classics at 16." Proficiency on this instrument, which is often mentioned in Indian and Chinese Buddhist texts and other contemporary records, seems to have been regarded as part of the education of well-bred young women. Musicians playing it may be seen represented in the Tunhuang murals (4th-13th centuries) in Kansu province, the Yunkang caves in Shansi (4th-6th centuries) and in Indian works of art of the fourth and fifth centuries A.D.

From the same source came the *pipa*, a stringed instrument widespread in ancient India and Persia as well as the "Western Regions". It too was said to have first appeared in China in Han times, and its name is thought to be derived from the ancient Sanskrit *bharbhi*, meaning "to pluck a string".

In the middle of the fourth century, there were Indian musicians in Wuwei in Kansu province. In the fifth and sixth centuries, many Buddhist temples were built and Indian music was played in them to accompany the chants. Some monasteries had professional orchestras which gave lay as well as religious performances.

Music of an Indian type from Kucha, in Sinkiang province, gained great favour in the imperial court and among the people. The seven-tone scale of the *pipa* was introduced into China's imperial

court music in 568 A.D. by a Kuchan named Sujiva. A tablet recently discovered in Kudimiya-mala, southern India, gives the Sanskrit names for the tones—and they correspond to those found in old Chinese musical lore.

So highly esteemed was Kucha music that some of its numerous performers were given princely rank. The first emperor of the Sui dynasty (581-617 A.D.) tried to stem its popularity by insisting on purely Chinese music at court banquets. His failure was evidence that this importation had already entered the mainstream of our own culture, and his son and successor became a more avid patron of the "western" style than ever.

The second Sui emperor increased the number of the music-and-dance companies attached to the court from seven to nine. Of these the first was supposed to be Chinese, but was not purely so since it included such instruments as the *kunghou* and *pipa*. No less than five of the companies performed in various styles from the "Western Regions," which lie on the way to India. One was from India itself.

#### Indian Dance in Old China

Chinese dances, before the Han dynasty, were classified into two divisions—civilian and military. During the Tang dynasty the classifications were changed to "soft" and "vigorous", following the ex-



An orchestra of the Indian Cultural Delegation performs in Peking.



ample of India where the "vigorous" dance poses were called *Tandava-Laksanam*.

The deep influence of Indian dance on our own can be seen from a comparison of scenes portrayed on the walls of the Ajanta and Bagh caves with those at Tunhuang and Yunkang. The 122 poses of the "vigorous" school sculptured on the walls of the temple of Shiva at Cindambaram, southern India, include some readily identified in the combat scenes of our classical opera as performed today—as well as in Chinese acrobatics. Terra-cotta figurines of dancers from Chinese tombs of the Tang dynasty exhibit hand-gestures like those shown in ancient Indian and Persian paintings.

In the music-and-dance schools of the Sui and Tang periods, the "Tien Cho" or Indian mode was taught as a separate subject. The *Ni Shang Yü Yi Chu*, the most celebrated dance of the Tang dynasty, was adapted from an Indian prototype by the "Brilliant Emperor", Ming Huang (713-755). Po Chu-i immortalized it in a famous poem of that name. Also of Indian origin were three dances imported from the northwest and mentioned in the *Old Tang Chronicles*: the martial *Mask Dance of the Prince of North Chi*, which portrays the military exploits of that hero; the tragic *Sorrow-shaken Woman*, giving plastic expression to the sadness of a beautiful wife humiliated by her drunken husband; and *Killing the Beast*, which celebrates the prowess of a son who hunted down the wild animal which had killed his father.

#### From China to India

The influence was not one-sided. Chinese music of the Tang dynasty, which spread east to Korea and Japan, also penetrated west to Central Asia and India. The renowned Chinese Buddhist monk and traveller Yuan Chwang, in his *Record of the Western Regions*, describes his reception by King Siladitya II (also known as Harsha Vardhana) who ruled northern India in the middle of the seventh century. He reports that the king praised the culture of Tang, and asked Yuan Chwang to tell him of the *Victory Dance*



Krishna Kutty teaches Chinese dance students the Kathakali.

of *Prince Chin*, then used at the Chinese court to extol the reigning emperor Tai Tsung. The king also requested that this dance be taught to the Indians.

One of the items performed by artists of the Indian Cultural Delegation to China this year was the *Jaltarang* or "water music". A similar arrangement, with notes given out by twelve porcelain cups containing varying amounts of water and struck with chopsticks, was popular in our country as early as the third century and has been described in Tang dynasty records. It was probably brought to India, where the water-instruments were supplemented by the *tabla* drum, by Chinese Buddhists who travelled there as pilgrims.

#### A New Beginning

Now a new China and a new India are reviving their long-broken ties. The travels of the Indian Cultural Delegation have given our artists a new opportu-

nity to learn from our neighbours, as we did so fruitfully in the past.

In Peking and other cities, Indian and Chinese workers in the same field have exchanged experiences and carried on animated discussions of vocal and instrumental music, dance, drama and painting. Eight Chinese dance students accompanied the delegation on tour and took the rare opportunity of being taught by Krishna Kutty, renowned exponent of the Kathakali dance. Enthusiastic over their progress, Kutty said: "Art is a common language that can be understood by all peoples".

Present Sino-Indian cultural contacts, it must be said in conclusion, are not confined to building on the great past. We are forging links between the new cultures of two great peoples who are helping shape the world of today. Mr. Chanda, head of the Indian delegation, was right when he said, "This is only a beginning".





Four Shanghai industrialists, all deputies to the National People's Congress: (Left to right) Tang Ti-yin, fountain-pen manufacturer; Yung Yi-jen, textile mill proprietor; Hu Chueh-wen, owner of an engineering plant; Wang Chih-hsin, condiment manufacturer.

## How about Private Enterprise?

YUNG LUNG-KWEI

THE target of effort for the whole Chinese people, as defined in our Constitution, is to "guarantee that China can in a peaceful way banish exploitation and poverty and build a prosperous and happy socialist society".

But though socialist state industry is developing at a much faster rate, and though much of capitalist industry has changed over to joint state-private ownership, private industry in China, under the leadership of the state economy, has also continued to grow. Between 1949 and 1952, the value of its output increased by 65 per cent. And in 1953, the first year of our Five-Year Plan, it rose a further 20 per cent.

Capitalism and socialism are, of course, mutually contradictory economic systems. Yet in present-day China, during the transition to socialism, private capitalist enterprises which meet the needs of the people and state have an important role to play. Chairman Mao Tse-tung made this clear in July 1949, on the eve of the foundation of our People's Republic, when he declared: "The national bourgeoisie is of great importance at the present stage . . . To meet imperialist pressure and rise from her low economic position, China must utilize all elements of urban and rural capitalism that are beneficial and not harmful to the national economy and the people's liveli-

hood, and unite with the national bourgeoisie in the common struggle".

### Government Policy

In harmony with this policy, the People's Government confiscated and nationalized only those concerns which had belonged to the reactionary Kuomintang government, or to the so-called bureaucrat-capitalists, who were at the same time officials of that regime. Foremost among these were the "Big Four Families" (of Chiang Kai-shek, T. V. Soong, H. H. Kung and the Chen brothers), who used their controlling position in the state to create personal monopolies. Their holdings included the biggest banks, industries, mines and commercial houses, which worked hand-in-glove with foreign imperialism. They could always secure foreign exchange from the Kuomintang to buy goods and equipment abroad, and only they got big loans from its state banks. They also enjoyed priorities in the supply of raw materials and had access to official information which allowed them to gamble successfully on the inflation at the expense of their rivals and of the whole people. It was their far-flung properties which were confiscated and became state, socialist enterprises after the liberation.

Those capitalists who were not closely connected with the Kuomintang government, or with imperialism, had suffered under the Kuomintang. They enjoyed none of the privileges of the "Big Four" monopolies—which were pushing them into bankruptcy. These people were the national bourgeoisie to which Chairman Mao referred in the declaration quoted above. The newly-established People's Government did not touch their property—instead it helped many to regain their feet and expand their enterprises in accordance with the needs of the people and state. Their activity has been of value to the people insofar as it could increase the supply of industrial products, help the state to accumulate funds for socialist industrialization through taxes and savings, provide employment, and train skilled workers and managers. It is of them that our Constitution speaks when it lays down that ". . . the state protects



the right of capitalists to own means of production and other capital according to law".

### Scope and New Investments

Industries in which private enterprises continue to exist and flourish include metals and machinery, chemicals and pharmaceuticals, building materials, rubber, paper, cotton textiles, dyeing and printing, processed foods, clothing and many others. Many such factories have erected new buildings and added to their equipment in the past five years. Take for example, four private cotton mills in Shanghai—the Wing On Cotton Mill, An Ta Spinning and Weaving Co. (which has since become a state-private joint enterprise), Kuang Chin Cotton Mill and Li Hsin Spinning and Weaving Co. Between them they have installed 20,784 new spindles, all operating at full capacity, and had added 107,640 square yards to their floor space by 1953.

In addition, the Wing On Cotton Mill has put in a new 7,500-kilowatt generating plant.

Much of the new investment in private industry and joint state-private industry has come from patriotic Chinese residing abroad—whose participation in national construction is always welcomed by the state.

The overseas Chinese have been all the more eager to invest in the homeland because of rising taxes in the countries where they



Technicians of the private Chung Yuan Telephone Appliance Factory, Shanghai, testing one of their products—the first China-made telephone set for divers.

live, and the difficulties they have suffered due to the United States embargo on trade with China. State-private investment companies have been formed to meet their needs. In Canton there are the South China Enterprise Co., Ltd., the Overseas Chinese Industrial Construction Co., Ltd. and the Canton Investment Co., Ltd. In Foochow there is the Fukien Investment Co., Ltd., in which both the government and private individuals hold shares.

In Kwangtung province, for example, it has already been laid down that after the turn-over to a socialist economy, shares in

state-operated investment companies held by overseas Chinese will continue to be their private property. Shareholders will receive a guaranteed interest of not less than 8 per cent per annum.

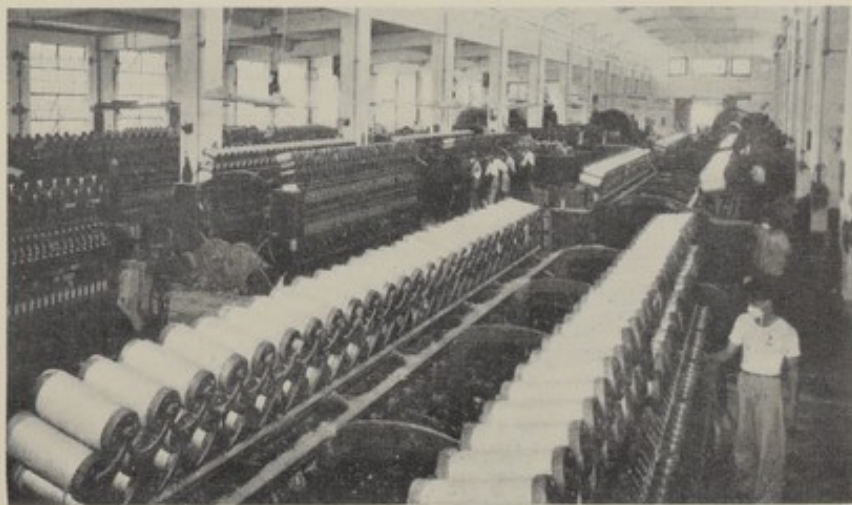
Many Chinese living abroad have also put money into the import-export trade and set up factories in China such as the Hua Chien Jute Mill, South China Sugar Mill, South China Rosin Factory and others.

Overseas Chinese who return to Fukien province are permitted to rent forest land, or uncultivated land for agriculture or stock-breeding, with 15 to 20 years security of tenure. In this and other provinces, they have set up handicraft industries, construction companies and transport services.

### Taxation

Taxes on private industry, which are simple and reasonable, are designed to facilitate the growth of production, and to encourage the manufacture of things the people need. They are of three main kinds—some alternative to the others.

The Commodity Circulation Tax, levied since January 1, 1953, is already applied to 56 commodities and will be extended to more. It is paid when the goods leave the factory, after which they are not



Overseas Chinese capitalists have invested in this big new jute mill in Canton.





The nursery of the Wing On Cotton Mill, Shanghai, set up since the liberation.

subject to commodity tax and business tax. Goods now under this system include cigarettes, wines, flour, cotton yarn, matches, printing paper, cement, plain glass, steel products and others. The rate ranges from 5 to 22 per cent *ad valorem*, and is higher for cigarettes and wines than for the other items.

The older Commodity Tax is charged in place of the Commodity Circulation Tax where the latter is not yet applied. It too is collected when the goods leave the factory. Only if they are re-sold, is an additional business tax charged. Subject to it are 176 items of goods under 36 categories, including cosmetics, soft drinks, sugar, tea, marine products, woollens, silk, linen, electrical goods, metals, dyes and pigments, vegetable oils, grain, etc. The rate is from 2 to 25 per cent.

Industrial and commercial taxes vary with the class of business and the income of the paying concern.

One variety, the Business Tax, is levied on enterprises dealing in commodities which are not subject to either of the two taxes described in the preceding paragraphs. Thirty-eight main branches of industry are now in this category. The Business Tax runs from 1 to 3.5 per cent of the turnover of the enterprise concerned.

The second variety is the Income Tax, compulsory for all profit-making enterprises. The rate is progressive from 5 to 30 per cent of net income. Since the policy is to encourage certain branches of industry which the nation needs, tax rebates of from 10 to 40 per cent are granted to machine-

#### PRIVATE PLANTS MAKE GOODS FOR EXPORT

As China's foreign trade expands, privately-owned factories are making more and more products for export through state trading companies. The products include some which China formerly bought from abroad, such as electric motors, tyres, textile machinery parts, bicycles, sewing machines, woollen goods and ephedrine.

From September 1954 to February 1955, for instance, the state-owned Industrial Chemical Raw Materials Corporation placed orders for more than twenty kinds of exports with private concerns in Shanghai. Among these were copper sulphate, sodium sulphide, glycerine, paint and sulphur black.

Sodium sulphide produced in three privately-owned Shanghai factories is now sold in Europe and Africa. Because of their good quality, the international demand for Chinese chemical products has increased, and the factories making them have expanded.

building, mining, metallurgical, chemical, rubber and medical industries.

There is also a Stamp Tax on some types of commercial documents, and a 5 per cent tax on income from deposits and securities.

Customs and salt duties (salt is a traditional monopoly in China) are being revised to eliminate some unreasonable features inherited from the past.

#### Profits

Under the law, capitalist enterprises are entitled to a reasonable profit. But because the changes in the national economy have been very rapid during the past few years, the government has not yet fixed a unified rate for profit for the various industries.

State trading agencies often place orders with private manufacturers or processors. This is the most widespread arrangement by which capitalist concerns are linked to the state economic plan. The prices paid allow for annual profits ranging from 10 to 30 per cent of the capital outlay, depending on the circumstances. Factories which have improved their management or reduced costs may make higher profits within a specified period. These are regarded as perfectly legitimate, providing the manufacturer produces goods up to specification and does not violate government regulations as to quality, wages and prices.

No national figures for actual profits in private industry have yet been compiled. Below we cite some from the textile industry in Shanghai. Of 35 private cotton mills there, of which 17 showed a profit and 18 a loss in 1950, all showed profits in 1953. The total of those profits before payment of income tax increased from ¥4,120,000 in 1950 to ¥54,800,000 in 1953. Conditions in other branches of private industry were similar.

Profits are distributed into four parts. One part goes for income tax to the state, another into a reserve fund, a third for welfare funds and bonuses for workers and employees, and a fourth for dividends to the capitalists. The last should amount to about 25 per cent of the whole, but there are cases where it is greater. When



the capitalists' share is less than 25 per cent of the total profits, adjustments are allowed provided agreement is reached with the workers.

Capitalists are absolutely free to use their share of the profits in any way they please. Not infrequently, they re-invest it to expand their enterprises.

#### Changes and Prospects

What changes have taken place in Chinese private industry over the past few years, and what are its prospects?

The changes have been very great. Under the Kuomintang, most of the raw materials for light industry were imported. On the other hand, goods made abroad from Chinese raw materials actually drove some domestic products from the home market (this was the case with cigarettes). China did not make her own machines—she only assembled and repaired them. Oppression by foreign imperialism and the Kuomintang made it impossible for our national industry to grow.

The liberation removed these obstacles. Chinese light industry, which is largely private, now supplies unprecedented quantities of good, inexpensive consumer goods. Both the supply of raw materials, and the markets, are guaranteed by the state. Private industry is also producing machine tools, electric motors and transformers, as well as machines for the textile industry, paper-making, sugar-refining and other branches of production.

As for the future, our national policy requires that all sectors of China's economy march toward socialism. For capitalist industries, the transformation will take quite a long time. Its transition lies through state capitalism, which gears it into the economic plan of the state as a whole.

In his Report on the Work of the Government in 1954, Premier Chou En-lai said:

In the past few years we have already transformed a major section of capitalist industry into various forms of state-capitalist enterprises. Judging by the trend

This 2,700-ton freight vessel was built by the Chung Hua Shipbuilding Plant, Shanghai, which has both private and state shareholders.

of events, the transformation of capitalist industry will be brought about chiefly through joint state and privately owned enterprises—the advanced form of state-capitalism. In 1953, the value of output of industries jointly operated by state and private capital was over nine times as great as in 1949, and in 1954 it is expected to be more than double the 1953 figure.

Premier Chou also spoke of the importance of the intermediate form of state-capitalism, in which the state places manufacturing and processing orders with private enterprises or makes sales and purchasing contracts with them.

... this form prepares the ground for the joint operation by both state and private capital; and even greater successes have been registered in this direction. In the first half of 1954, in eight leading cities, the value of output of the capitalist industrial enterprises which accepted government orders for manufacturing, processing, buying and selling accounted for about 80 per cent of the total value of output of all the capitalist industrial enterprises in these cities.

When the First Five-Year Plan was presented for approval to the National People's Congress in July 1955, Vice-Premier Li Fu-chun, who heads the State Planning Commission, projected the timetable for the transformation of private enterprise. By 1957, he said, the majority of capitalist industries will have come under one or another form of state-capitalism, and the majority of those belonging to the category of modern industry will be under joint state-

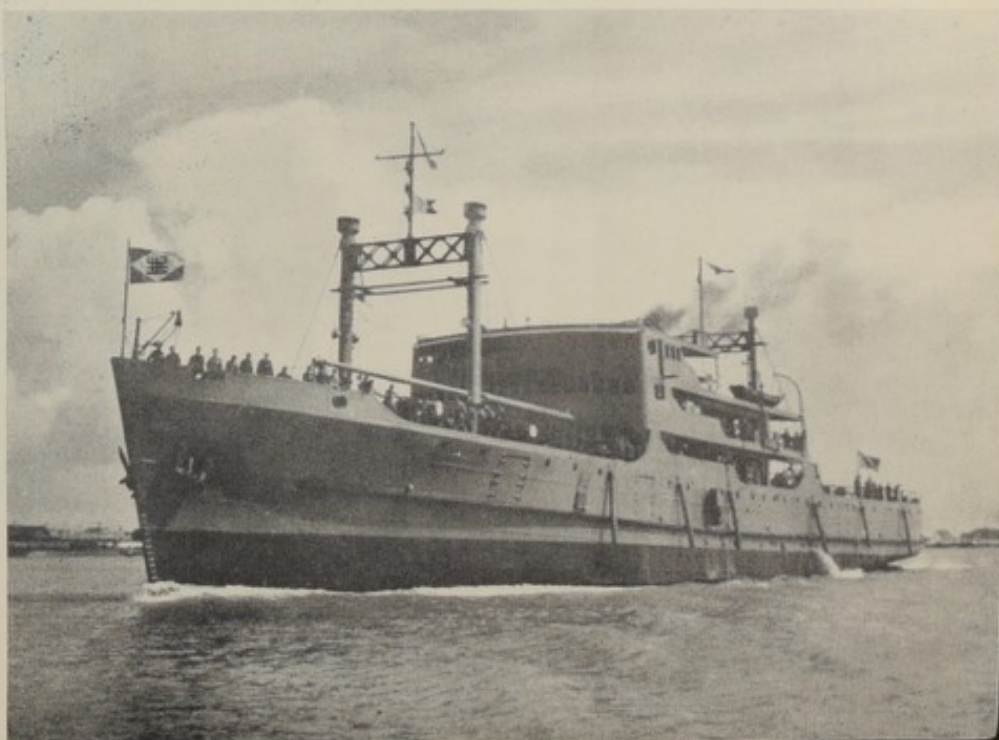
private ownership. In private commerce, more than half of the enterprises will be state-capitalist (small traders and pedlars will move toward socialism through cooperatives).

More and more capitalists are realizing that this is the right road for the present period. Moving along it, they can expand production and retain their legitimate share in the enterprises concerned.

#### The Future

The task, as one can imagine, is a difficult one. Nonetheless, it is being carried out successfully, which daily benefits both the state and the enterprises involved. The newest figures show this clearly. In eight leading cities in China, the value of output of private enterprises in February 1955 was some 15 per cent above that of January. It had advanced a further 3 per cent by March.

Chinese capitalists, like all citizens, are expected to consider public interests before private ones, and to act for the long-term benefit of the nation. Provided they abide by the government's laws and regulations and accept their own transformation along with that of their industries, the state will safeguard their legitimate rights. Those who do this will always have work in accordance with their services and ability. Their welfare will be safeguarded and they will enjoy constitutional rights and freedom along with the rest of the people.





# Trade Winds



## Rapid Growth of Sino-Burmese Trade

A YEAR and a half has passed since the first trade agreement between China and Burma was signed in Rangoon in April 1954. Since then, together with the growth of friendship and the strengthening of diplomatic and cultural ties between the two countries, the commerce between them has grown steadily.

The initial agreement was for a period of three years. It laid down the principle of equality and mutual benefit and contained a schedule of goods each side was willing to supply. China's export list included coal, silk, woven silks and cottons, agricultural implements, sundry manufactures, porcelains, canned foods, medicinal herbs, tea and cigarettes. Burma offered rice and rice products, beans, oilcake, lead, zinc, timber, rubber and cotton. Payments were to be made in £ sterling.

### Buying Burmese Rice

Shortly afterwards, Burma encountered certain difficulties because of inability to sell her excess rice, which normally makes up 75-80 per cent of her exports. This situation had been growing steadily worse since 1953, when the United States began to dump its surplus agricultural commodities in the Asian countries that were Burma's normal markets.

U Hla Maung, the Burmese Ambassador in Peking, inquired if China was interested in making purchases. Though China is a rice-producing country herself, she replied that she would welcome a Burmese trade delegation to Peking for business talks. Consequently, in November 1954, the Protocol Relating to the Exchange of Burmese Rice and Chinese Export Commodities was signed. At the same time, a contract was concluded for the sale of 150,000 tons of rice to China.

In December 1954, a joint communique was issued by China's Premier Chou En-lai and Prime

Minister U Nu of Burma, who was then visiting our country. It announced that China would import between 150,000 and 200,000 tons of Burmese rice in each of the years 1955-57, while Burma would import industrial equipment and materials as well as consumers' goods of equal value.

### China's Industrial Exports

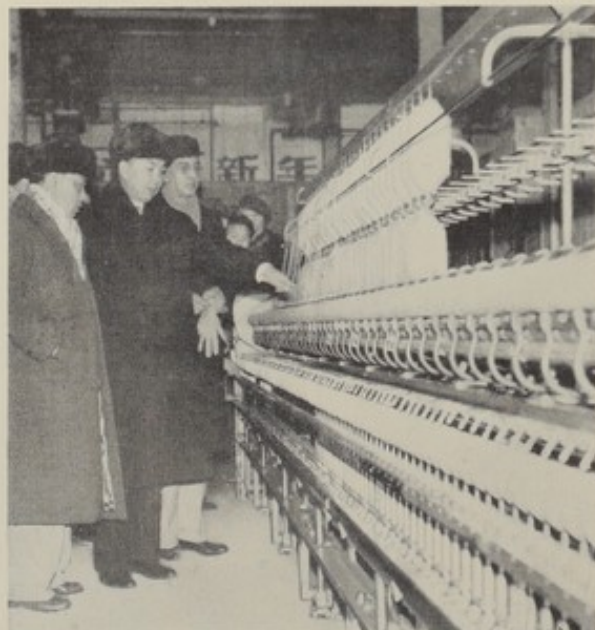
Subsequently Burma sent a second trade mission, led by her Minister of Highways and Rehabilitation, to negotiate the purchase of Chinese exports. After friendly talks, three contracts were signed to the value of £1,900,000. The goods China is selling include structural steel, steel plates, cotton yarn, newsprint, silk, sanitary and hospital equipment, glass and glazed tiles. The first appearance of steel products among China's exports is a mark of our industrial progress. It is also a sign of our willingness to share the fruits of this progress with our neighbours even at this early stage, when we ourselves need all the industrial materials we can make.

Noteworthy too is the impression the Burmese mission gained of the standard of Chinese manufactures. U Tun Kyain, a private businessman who was one of its members, said: "Chinese exports are of high quality. They conform to international standards and are in no way inferior to goods from the Sterling Area." Besides inter-governmental trade, China and Burma have undertaken

to assist in developing business between Burmese private merchants and national corporations in China.

Since the return of the mission, as a direct result of its observations on a tour of Chinese industries, Burma has expressed the wish to buy complete sets of Chinese machinery for cotton spinning and weaving mills. The Chinese government has consented to sell them, and has sent a group of technicians to Burma to study what types of equipment are most suited to her needs. Still more recently, as an example of the varied fields in which exchange between the two countries is now taking place, China has contracted to supply Burma with breeding stock for certain draught animals.

The quick growth of trade between China and Burma shows how Asian countries, given a friendly spirit, can help one another overcome obstacles. It is an initial example of the great possibilities recognized in the declaration of the Bandung Conference, which rejected the imperialist contention that, because the economies of Asian countries are similar, they cannot substantially expand their mutual commerce.



The second Burmese trade mission sees textile machinery made in Shanghai.



# Architectural Decoration

MO TSUNG-CHIANG

THE distinctive national style of the old Chinese architecture has its source in the artistic use of its basic structural material, wood. Ancient China had magnificent cities: Changan (now Sian) and old Loyang, in the Han and Tang dynasties, and Tatu (on the site of Peking) in the Yuan dynasty.\* But their buildings perished in the fires of war, and only incomplete descriptions survive. The architectural monuments we can see today are of later date. The outstanding ones are in Peking, which has an architectural history of 800 years.

The capital of New China is one of the world's most beautiful cities. In expanding and remodeling it, we are preserving its old palaces, temples and imperial parks with great care. The Imperial Palace, Temple of Heaven, Summer Palace and other famous places are being restored. The old colours are beginning to glow with sparkling freshness in the hands of knowledgeable building workers and craftsmen.

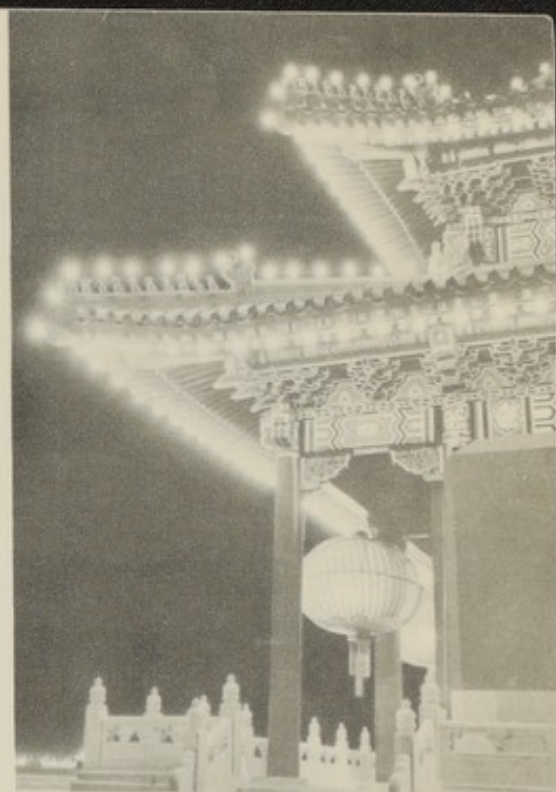
The use of brilliant colour to add splendour to imposing buildings is one of the chief characteristics of Chinese architecture. It had its origin in a practical necessity—protecting the wood from the effects of weather, rot or parasites. Thus pillars and other structural timber came early to be coated with cinnabar (red mercuric sulphide), with black pigment or tung oil. Soon this necessary practice was adopted for decorative purposes. Ornamental designs were painted on the upper part of red, russet or black painted pillars, or on horizontal elements such as beams, railings or the undersides of projecting eaves, mak-

ing a pleasing contrast with the yellow, white or scarlet walls and the white stone pavings and parapets.

The basic colours of these designs, as seen now, are generally "cold" ones—indigo or jade green—embellished with gilt patterns. A striking effect is sometimes obtained by the use of vivid combinations—scarlet railings flanking green pillars, green tiles surmounting vermilion pillars, gold studs on massive red gates. The general architectural style is majestic. The use of colour adds brilliance and a vivacity. A harmonious blend with the surrounding scenery is generally aimed at.

WITH regard to chronology, we know that vermilion was already being used as a preservative on structural timber three thousand years ago. Decorative designs appeared in the eighth century B.C. and became more varied during the first two centuries A.D. During the fifth and sixth centuries, when Buddhism flourished and spread in China, our artisans boldly assimilated the art which came with it from India—producing many new decorative designs. It was then that the lotus, the pearl, the conventionalized flower border and winding stream motifs joined the older ones. The final form, summing up centuries of development, featured cloud, dragon and phoenix motifs, as well as patterns resembling watered silk.

After the eleventh century A.D., following violent periods of war, many great works of architectural decoration were lost. In the Ming dynasty (1368-1644 A.D.), the art was still strongly creative and flexible in design, but it became somewhat formalized during the Ching or Manchu dynasty (1644-1911). Big buildings put up in or



Tien An Men, Peking's most famous building.

after the eighteenth century were stereotyped and monotonous in design and technique. Technical skill remained high, but craftsmen worked according to a strict and stifling system, each one carrying out a limited number of set designs.

Overleaf, we present copies of some architectural decorations of the seventeenth and eighteenth centuries—the late Ming and Ching dynasties. In these designs only gold and three basic colours—red, blue and green—are used, as a deliberate way of producing the brilliant contrast characteristic of such decoration. Because it is necessary that the paint should also be a preservative, all are mineral colours. This gives them a fundamental harmony unattainable with synthetic dyes.

Few professional practitioners of the art are still active. But today the large-scale building programme being carried on in Peking and elsewhere, opens the door for a revival of this valuable part of our national culture. Veteran designers have been enlisted to help train new ones. A great deal of research is being done.

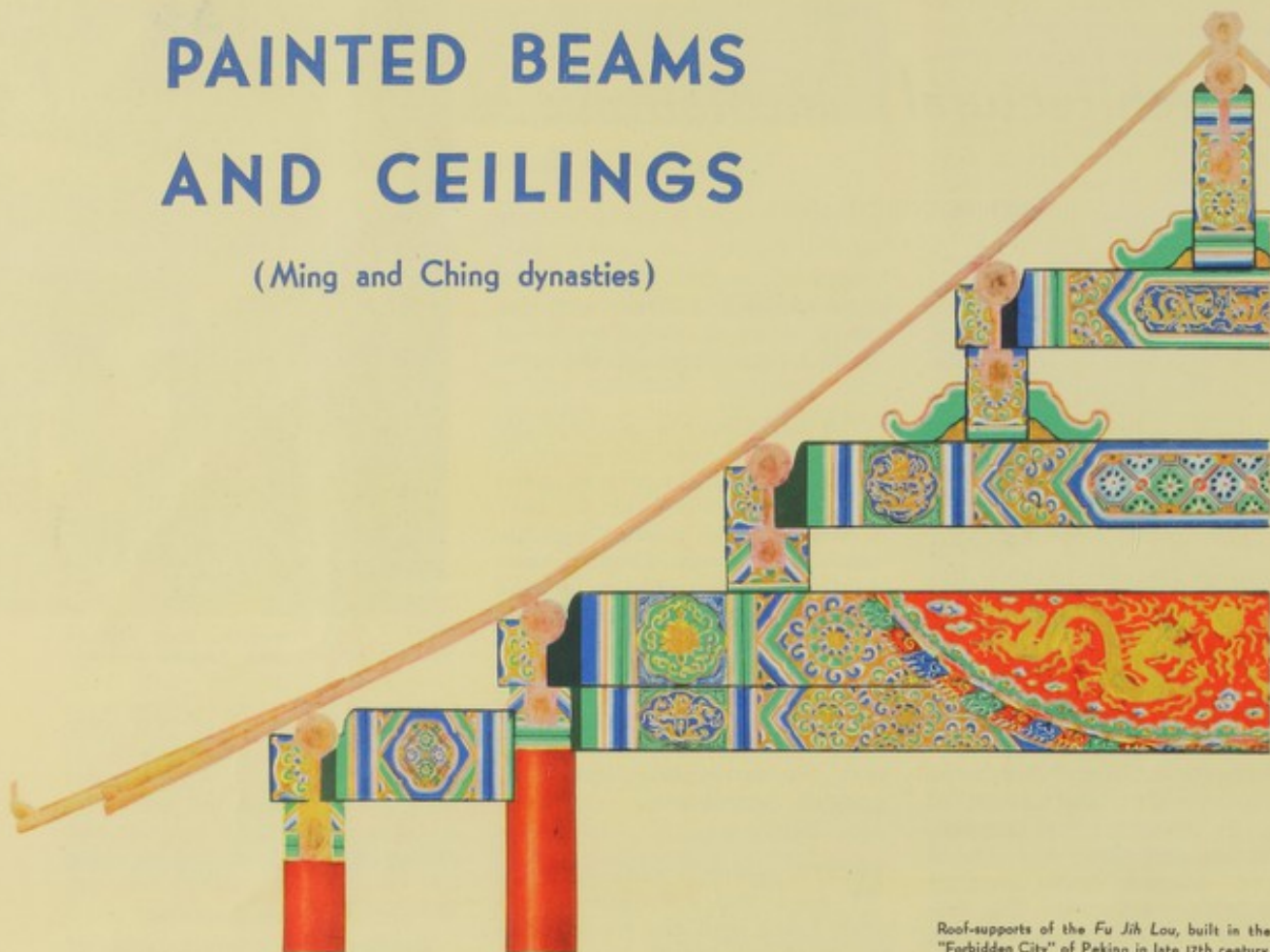
The designs reproduced on the following pages were copied under the guidance of the 82-year-old decorator Liu Hsin-ming.

\*The Han dynasty reigned from 206 B.C. to 220 A.D., the Tang from 618 to 907, and the Yuan from 1280 to 1368.



# PAINTED BEAMS AND CEILINGS

(Ming and Ching dynasties)



Roof-supports of the *Fu Jih Lou*, built in the "Forbidden City" of Peking in late 17th century.



Detail of the exterior roof-supports of the *Fu Jih Lou* (outside view).





Detail of beam in the East Covered Walk of the Fu Jih Lou.



Ceiling panel of the main hall of the 11th-century Shan-hua Temple in Tatung, Shansi province, painted in 1740.



Ceiling panel of the Ten Thousand Buddhas Pavilion of the Chih-hua Temple, built in Peking in 1444.



Ornamental details from the Ching Cheng Mosque built in Peking in the 15th century: (left) gilded pillar, (above) details of beams as seen from the front and from below.  
Photos by Ku Shu-hsing





Pien Chueh (5th century B.C.), first in the world to use the pulse in diagnosis.



Hua To (2nd century A.D.) applied general anesthesia in surgery.



Chang Chung-ching (2nd century A.D.) wrote "The Treatise on Fevers" and other works.



Li Shih-chen (1518-1593 A.D.) wrote "The Compendium of Materia Medica".

## THE STORY OF CHINESE MEDICINE

LI TAO

China, at various times in the past, led the world in medicine, surgery and pharmacology. The long persistence of feudalism, however, halted the development of our traditional medical science. Still later, political and cultural domination by imperialism led our own modern-trained doctors to neglect its great value.

Nonetheless, Chinese medicine never ceased to live. Its practitioners have continued to serve and heal millions of people. Since the liberation, many of its assumptions and practices have been scientifically examined and found to be in accord with the most advanced present-day ideas.

Now traditional and modern-trained doctors are cooperating and learning from each other. The bridging of the centuries-old gap between Chinese medical science and that of the rest of the world will contribute to the health of our people and of all mankind.

**H**OW old Chinese medical science is can be gauged from one fact. "Oracle bones" of the thirteenth century B.C. bear



Oracle bone of the 13th or 14th century B.C. The character at upper right is the ancient form of the Chinese word for scabies. As can be seen by turning the page sideways, it shows a man with spots lying in bed.

inscriptions describing various ailments of the human body. *The Book of Rites*, a manual of ceremonies written in the Chou dynasty (12th century B.C. to 403 B.C.) records the court physicians' division of medical teaching into internal medicine, surgery, nutrition and veterinary practice. *The Book of Odes*, a collection of ancient poetry of the same period, mentions more than a hundred different herbal remedies and drugs.

In the Eastern Chou period (770-403 B.C.) trade began to flourish extensively and there were continued wars between various Chinese feudal states. This contributed to the spread of medical knowledge from one to another. Physicians all over China were lancing boils with the *pien shih*, a stone knife which had originated near the east coast in what is now Shantung; they were using herbal

remedies from Shensi in the west; moxibustion\* from Hopei in the north; acupuncture\*\* from Hupeh along the middle reaches of the Yangtze; and systems of massage from Honan in central China. By the fifth century B.C. there were already general practitioners for ordinary people as well as court physicians for the emperors. As a means of diagnosis they observed

\* and \*\* Acupuncture and moxibustion, two medical inventions of ancient China, date back to before the twelfth century B.C.

Acupuncture is the insertion of metal needles into various spots on the body to stimulate and readjust the control and regulatory functions of the higher nervous system so as to bring about the desired cure.

Moxibustion is the burning of a cone or stick of moxa (wormwood or *artemisia vulgaris*) over a given spot of the body to produce a hot compress effect, to stimulate the nerves and produce a curative result. The burning does not hurt the skin.



the patient's respiration, the colour of his face and the quality of his voice.

### The Pulse in Diagnosis

The taking of the pulse, a great step in the history of world medicine, was discovered and added to Chinese methods of diagnosis by Pien Chueh, a famous physician of the period of the Warring States (403-221 B.C.). It spread to Korea and Japan in the sixth century A.D. and to Arabia in the ninth century. The great Muslim physician Avicenna, writing in the tenth century, mentioned pulse-taking in his *Canon of Medicine*, a book which was a basic textbook for European physicians up to the eighteenth century. In the Hindu medical classics, the taking of the pulse is not mentioned until the thirteenth century. This suggests that India too adopted this method from China.

Our ancient chronicles tell how Pien Chueh saved the prince of the state of Kuo, who had lost consciousness and been given up for dead by his court physicians. Pien Chueh felt his pulse, found that he was still alive and gave him treatment which resulted in his recovery. Pien Chueh was the first physician to attempt a summing-up of the whole of the existing medical experience. He travelled all over the Warring States, studying and practising at the same time. An enemy of superstition, he denounced all attempts to treat disease by witchcraft, and is reputed to be the author of *Nan Ching* (the Difficult Classic), an attempt to put pathology on an anatomical basis.

### Early Preventive Medicine

During the Chin and Han dynasties (between 221 B.C. and 220 A.D.), the country was united as a single state. Chinese medicine developed rapidly. In 26 B.C. a physician named Li Chu-kuo revised a number of popular medical books, including the *Huang Ti Nei Ching* (Yellow Emperor's Inner Classic). This manual, which tradition dates back to very ancient times and which was certainly in existence by the third century B.C., has been used by scores of generations of Chinese



A pulse-lore diagram from "Treasures of the Ilkhan on the Sciences of Cathay", prepared by Rashid al-Din al-Hamdani about 1313 A.D. (From Joseph Needham, "Science and Civilization in China".)

doctors. The remarkable thing about this book is the similarity of its basic theory with that of today's preventive medicine. It states that the human body is an integral part of the universe, and that it can be protected from disease by adaptation to changes of environment. To cure an illness after it occurs, says the *Huang Ti Nei Ching*, is like digging a well after you have become thirsty or forging weapons when the battle has already begun. Ailments must be "cured" before they arise, it prescribes, by leading a regular life with proper diet, work and rest, and by maintaining a calm heart and mind.

### Han Medicine and Surgery

Another book, *Shen Nung Pen Tsao Ching* (Shen Nung Materia Medica), written about the first century B. C., records more than 300 kinds of remedies and their uses. It contains the world's first known prescription of mercury and sulphur for

skin diseases. This treatment appeared in Arabia and India a thousand years later, and was not used in Europe until the sixteenth century A.D.

In the second century A.D. the physician Chang Chung-ching wrote the *Shang Han Lun* (Treatise on Fevers) and another work, *Ching Kuei Yao Lueh* (Medical Principles and Essentials), both of which were big factors in the development of internal medicine in the Han dynasty. They give many prescriptions for the treatment of fevers and other diseases, and name some eighty kinds of medicaments, including antipyretics, cathartics, diuretics, emetics, sedatives, stimulants, digestive remedies and antidiarrhoeal drugs—which even today serve as an important basis for Chinese medical practitioners. The *Shang Han Lun* was also widely used in Korea and Japan, where it played a valuable part in the health of the people.

Surgery also attained a high level in the Han dynasty. The renowned doctor, Hua To, performed major abdominal operations under general anaesthesia (induced by a drug). He also employed emetics to cure intestinal worms, and hydrotherapy for the effects of wounds. He was the inventor of a form of physical exercise which imitated the movements of five animals—the tiger, the stag, the bear, the monkey and the bird for the cure of chronic diseases.

It is a great loss to Chinese medicine that most of Hua To's works were destroyed after he was arrested and executed by a military despot of his day.

Dr. Ma Ying-ting, a veteran practitioner of Chinese medicine, now uses modern instruments as an aid to diagnosis.





### Wide Asian Contacts

Between the Western Tsin dynasty (265-316 A.D.) and the Tang dynasty (618-907 A.D.) the rival religious faiths of Taoism and Buddhism both used medicine to win followers. The Taoists edited many traditional Chinese medical books. The Buddhists translated a number of Hindu medical works, including those of the two great physicians Jivaka and Susruta. This led to an assimilation of Hindu medical knowledge into Chinese practice. As one result, the *Shen Nung Materia Medica*, when it was revised in 500 A.D., contained mention of twice the number of drugs appearing in the original work.

Between the seventh and ninth centuries, when Europe was still in the Dark Ages and India was split into numerous small states, China was the world's centre of medicine. Learned men from Arabia, Korea, Japan and elsewhere came to study Chinese medicine, and Chinese physicians were invited to teach abroad. The introduction of Chinese medicine into Japan dates from this period. It freed that country from healing by witchcraft, and was honoured there as "Imperial Han Medicine".

### World's First Medical School

China can also claim to have established the first medical school in the world. This was the Imperial Institute of Physicians, set up under the Tang emperors in the early part of the seventh century A.D.—two hundred years before the Salerno Medical School in Italy, the oldest in Europe. Prior to that time, Chinese physicians had handed down their medical knowledge to a few favoured pupils.

The Imperial Institute had some 350 students, studying in four departments—medicine, acupuncture, massage and "spells" (a practice introduced under Buddhist influence which did not play an important role, Chinese medical science having thrown off the influence of sorcery almost a thousand years earlier). The department of medicine was subdivided into sections for medicine, surgery, pediatrics, moxibustion and the ears, eyes, mouth and teeth. There



Life-size bronze figure cast in 1927 A.D. with holes for practising acupuncture.

was also a section for *materia medica*, where the students learned to cultivate medicinal herbs and produce drugs. Textbooks were authorized by the government and the period of study was from three to seven years.

The existence of hospitals in China dates back to 510 A.D. when one was set up for the sufferers from a serious epidemic in Shansi province. More hospitals came into existence during the Tang dynasty, by the end of which there were government-organized hospitals for the poor, as well as leper hospitals.

During the Tang dynasty too a revised edition of the *Materia Medica* was produced, containing notes on 844 kinds of medicaments. Further valuable work was done in the eleventh century at the time of the Sung dynasty (960-1279 A.D.) by an official body known as the Bureau for the Revision of Medical Books. By this time the

invention of printing had led to a fairly widespread distribution of medical literature.

### Further Advances

Between the tenth and fourteenth centuries there was increasing contact between China on the one hand and Arabia and Eastern Europe on the other. The interflow of trade and culture quickened the progress of Chinese medicine and introduced into Europe, as we learn from Marco Polo, such things as rhubarb, cassia, China-root and ginger. Another stimulus to progress at this stage was the keen debate between various factions of Chinese physicians, each offering new ideas for the revision of the inherited knowledge.

The divisions of medicine were increased to about thirteen—including internal medicine, surgery, gynaecology, eyes-mouth-throat, pediatrics, orthopaedics, acupuncture and moxibustion, neurology and infectious diseases. Acupuncture and moxibustion increased in popularity. Life-size bronze models of the human body were made for training in acupuncture, with holes in them at the spot where needles were to be thrust in. The figures were then covered with a layer of wax and students practised sticking the needles through the wax into the right place.

Medicines and drugs became an item of China's exports at the beginning of the fifteenth century under the Ming dynasty (1368-1644 A.D.) with the growth of her ship-building industry; Chinese trading vessels sailed all over the south seas and into Mediterranean ports.

### Smallpox Immunization

In the sixteenth century Chinese physicians devoted great energy to combating smallpox, the most devastating epidemic disease of the period. More than fifty medical books were written on this subject and a special branch of medicine was set up for treating the disease. In the middle of the sixteenth century a form of inoculation was invented; it consisted of extracting the contents of the pustules of a smallpox victim and either blowing it into the nostrils in powdered form or applying it to the nose on cotton. This method spread all over the country in the next two



hundred years and Russian doctors were sent to China to study it in the second half of the seventeenth century (through these visits it spread to Turkey). The English began to study the method from the Turks in 1717. Eighty years later, Jenner invented vaccination with cow-pox with this as a basis. It can thus be regarded as a main source of the present-day science of immunology.

#### A Great Pharmacologist

In 1578 A.D., having spent 27 years in research, the great pharmacologist Li Shih-chen completed his *Compendium of Materia Medica—Pen Tsao Kang Mu*—which is not only the principal work of traditional Chinese pharmacology but also a major contribution to modern medical science. It lists 1,392 kinds of remedies and some 10,000 prescriptions. The medical substances described, 1,094 of which are of vegetable origin, are carefully divided into 16 classes and 60 species and the book is thus an aid to botanical classification as well. The *Pen Tsao Kang Mu* has been translated into Latin, French, Russian, English, German and Japanese.

#### Stagnation and Isolation

When the Ching or Manchu dynasty (1644-1911) came to power in the middle of the seventeenth century, the ruling class, fearing foreign influence and anxious to consolidate their despotic power

over the Chinese people, set to work to block all trade and cultural relationships with other countries. During the reign of the emperor Kang Hsi (1662-1723) a number of official astronomers were beheaded or sent into exile for daring to conduct research into western astronomical science.

A textbook on anatomy, based on the works of the Frenchmen Thomas Bartholin and Pierre Dionis and compiled by a Jesuit missionary named Dominique Parrenin (who himself translated the work into the Manchu language) was banned from circulation. The Manchu rulers tried to turn Chinese intellectuals from the study of reality and forced them to spend their time reexamining the old Chinese classics in fruitless detail. In medicine too, scholars wasted their time in hair-splitting textual criticism of the ancient books. The conservatism fostered during 270 years of Manchu rule hampered all progress—and medical progress was no exception.

Western capitalism forced open China's doors after the Opium War of 1840, and the East India Company set up clinics in Macao and Canton. But at that time it is doubtful whether the efficacy of western clinical medicine was in any way superior to the Chinese. It was only after ether was first used as an anaesthetic in 1846 and antiseptics in surgery were introduced in 1867 that western medicine began to move ahead. Then the Chinese people began to think of western surgery as efficacious. But their attitude towards western medical science in general remained suspicious because it had entered China on the heels of the invaders in the aggressive Opium Wars.

The revolution of 1911 led by Dr. Sun Yat-sen put an end to the feudal autocracy of the Manchu Empire but in 1912 the warlord



Acupuncture treatment at a state hospital at Paoting, which like many others now has a department of Chinese medicine.

Yuan Shih-kai betrayed the revolution and plunged China into even deeper servitude to the imperialists. In official circles traditional Chinese medicine began to be regarded as unscientific and backward, and government schools were established to teach western medicine only. Finally, in 1929, the Chiang Kai-shek regime tried to make it illegal to practise Chinese medicine altogether. This aroused a big popular protest culminating in a demonstration led by nearly 300 Chinese physicians in the Kuomintang capital, Nanking. Though forced to give way to this protest, the Kuomintang continued to place obstacles in the way of the development of Chinese medicine and to foster disunity between physicians of the two schools, Western and Chinese.

#### Present Policy

The People's Government, soon after its foundation, set to work to heal the breach. This was one of the basic principles laid down by the First National Health Conference it sponsored in 1950, which turned the whole medical profession toward service to the workers, peasants and soldiers, and toward emphasis on preventive medicine.

Last year the *People's Daily*, China's leading newspaper, explained government policy toward traditional Chinese medicine in greater detail. On the one hand it affirmed the value of Chinese medicine, its rich experience and the great contributions it has made to the people's health over many centuries. On the other, it pointed out the shortcomings that had



A page from the first (1590) edition of Li Shih-chen's "Compendium of Materia Medica".



restricted its scope and growth. It called on those trained in western medicine to unite and work with the doctors of Chinese medicine so that the traditional theory and experience may be systematized, put on a scientific basis and made an integral part of modern medical science.

Instructions for practical measures in this regard have been issued by the government to all public health departments. The Ministry of Health's Department of Chinese Medicine, set up after the liberation, has been enlarged, and a national academy for research into traditional medicine has been set up in Peking. Shanghai, Nanking, Peking and other cities have opened hospitals of traditional medicine and centres for acupuncture. Peking also has an experimental institute for acupuncture and moxibustion, which is endeavouring to provide a theoretical basis for these procedures in the light of Pavlovian teaching on the role of the higher nervous centres in health and disease. Good results have been attained in the treatment of disorders of the nervous system, the digestive and locomotor organs.

Many hospitals of western medicine in China have opened departments of traditional medicine, or invited practitioners of the latter to join their staffs as consultants. Courses in Chinese medicine will shortly be included in the curriculum of a number of medical colleges, and doctors of western medicine are studying important Chinese medical books, which are now being re-published. The Chinese Pharmaceutical Society is planning to standardize several hundred traditional Chinese drugs in the next five years. And the Chinese Medical Association, formerly open to doctors of western medicine only, has instructed all its branches in the country to admit experienced Chinese physicians to membership.

It will take many years of co-operation and research to absorb the heritage of Chinese medicine into the general stream of modern medical practice. The completion of this task will bring a great advance in China's health service, and enrich medical science everywhere.



## Language Corner

### Something about Adjectives

HAVING learned some verbs we will now pass to adjectives. You already know how to say the usual greeting among friends: 你好? (pronounced *nee' how'*) meaning "Are you well?" The answer is 我好 (pronounced *wor' how'*), "I am well". In both cases, you will notice, we do not use the verb "to be", as in English, to connect the predicate adjective "well" with the subject. The Chinese expressions, translated literally, are simply "You well?" and "I well". If you remember this difference between the two languages, you will use such Chinese adjectives correctly.

Here are some new words, mostly adjectives, to practise with.

Written	Meaning	Wade Transcription	Pronounced
忙	busy	mang <sup>2</sup>	maang
貴	expensive	kuei <sup>4</sup>	gwui
便宜	cheap	p'ien <sup>2</sup> -i	pien-ye
美麗	beautiful	mei <sup>3</sup> -li <sup>4</sup>	may-lee
聰明	clever	ts'ung'-ming <sup>2</sup>	tsoong-ming
很	very	hên <sup>2</sup>	hun
這	this	che <sup>4</sup>	djer

Now, recalling things already learned, we can make the following sentences:

Meaning	Written	Pronounced
She (is) very beautiful, isn't she?	她很美麗，是嗎？	Ta' hun <sup>2</sup> may <sup>3</sup> -lee <sup>4</sup> , shr <sup>4</sup> ma'?
Yes, she (is) very beautiful.	是，她很美麗。	Shr <sup>4</sup> , ta' hun <sup>2</sup> may <sup>3</sup> -lee <sup>4</sup> .
(Is) this very cheap?	這個很便宜嗎？	Djer <sup>4</sup> -ger <sup>4</sup> hun <sup>2</sup> pien <sup>2</sup> -yee ma'?
(It's) not cheap, (it's) very expensive.	不便宜，很貴。	Boo <sup>4</sup> pien <sup>2</sup> -yee, hun <sup>2</sup> gwui <sup>4</sup> .
(Are) you very busy today?	今天你很忙嗎？	Djin <sup>1</sup> -tien <sup>1</sup> nee <sup>2</sup> hun <sup>2</sup> maang <sup>2</sup> ma'?
I (am) not busy today.	今天我不忙。	Djin <sup>1</sup> -tien <sup>1</sup> wor <sup>2</sup> boo <sup>4</sup> maang <sup>2</sup> .

You will notice that the indicator of time, 今天 ("today"), is put at the beginning of the last two sentences. This is its usual, though not invariable, place in the Chinese word order.

IN China, one often hears people saying 是不是? pronounced *shr<sup>4</sup> boo<sup>4</sup> shr<sup>4</sup>*, literally "Is not is?" meaning "Is it or isn't it?"; or 好不好? pronounced *how<sup>4</sup> boo<sup>4</sup> how<sup>4</sup>*, literally "good not good?" meaning "Is it good?" or sometimes "Do you agree?" (Rather like the English question "All right?" and used in the same sense.) In such simple questions, instead of the interrogative ending 嗎 *ma'*, we simply repeat the adjective or verb on each side of the negative 不 *boo'*. (For instance, in asking "(Are) you busy?" we can either say 你忙嗎? (*nee<sup>2</sup> maang<sup>2</sup> ma'*) or 你忙不忙? (*nee<sup>2</sup> maang<sup>2</sup> boo<sup>4</sup> maang<sup>2</sup>*)—literally "You busy not busy?")

FINALLY we would like to introduce you to the very useful adjectival particle 的 (Wade transcription *te'*, pronounced "de"). This is used to connect adjectives and other modifying words and phrases with the words they modify. Used after nouns or pronouns, it also shows the possessive case. Examples are given below:

Meaning	Pronounced	
這是一個美麗的花園。	This is a beautiful garden.	Djer <sup>4</sup> shr <sup>4</sup> ee <sup>4</sup> -ger <sup>4</sup> may <sup>3</sup> -lee <sup>4</sup> -de hua <sup>2</sup> -yuan <sup>2</sup> .
她的手很美麗。	Her hands are very beautiful.	Ta <sup>1</sup> -de show <sup>3</sup> hun <sup>2</sup> may <sup>3</sup> -lee <sup>4</sup> .



# WATER FOR LIU VILLAGE

TAN AI-CHING



Members of a mutual-aid team plant rice sprouts in a Liuchiatung paddy field.

**L**IUCHIATUNG, a little village of some two hundred families, nestles among the hills that rise round Chaohu Lake, in Anhwei province. Most of the families are called Liu. Hence its name, which means "Liu Family Village".

In late May when the spring wheat has just been cut, you will hear singing from the fields, and the clank of hand-operated pumps bringing water to slake the thirsty earth. This means that the terraced fields are being flooded for the year's second crop, rice. Here a man with a hoe is making shallow channels to conduct the water. There you may find yourself in the midst of an orderly bustle as a group of villagers diverts it first to one plot, then to another, according to a previously-agreed plan. Each householder knows just which day the water will come bubbling onto his land so that he can plant out his rice-seedlings. Whether they are members of the agricultural producers' cooperative or mutual-aid teams,

or whether they still farm individually, all the villagers enjoy equal rights to the water.

## Past Situation

Before the liberation, as the peasants tell it, things were very different at irrigation time. Then the fields rang not with songs but with angry shouts and quarreling. Family feuded with family. Heads were broken in the struggles to get a prior chance at the scant reservoir supply. In those days the people were constantly watching the sky for rain, their eyes haunted by the shadow of debt. If the season was too dry for rice, they would hurry to plant maize or sorghum so as to have something to eat through the winter.

It was not as though Liuchiatung had no water in the old days. The water was always at hand. The shallow Chiaosi River runs through the village. Between the fields lie some thirty ponds for catching water in the rainy season

and storing it for future use, dug in the distant past by the forefathers of the present inhabitants. But these ponds, until a few years ago, were in sad disrepair, choked with weeds or filling up with mud. One of the largest had become a marsh where cattle were sometimes pastured.

Some of the ponds used to belong to landlords who extorted money for water, but did little or nothing towards upkeep. Others were ownerless and equally uncared for. As for the river, there had once been a dam across it, a rough structure of mud and stones. But that too was a ruin, and year after year when the spring rains came down, the current would wash more of it away. The peasants, who had given up trying to repair it, called it "Broken Dam".

## Rebuilding the Dam

The big change began in 1950, when the land was divided among those who tilled it, and the peas-





Raising water from Chiaosi River by treadmills.

ants elected their own committee to run the village. The members, headed by chairman Liu Hsueh-shan, went to a meeting of local administrators called by the county people's government to discuss the improvement of irrigation in the whole area. On their return, Liu gathered them together, along with some of the older farmers, to see what could be done. The decision was to begin with the repair of the dam—why let the river run through unhindered while the fields on either side of it were dry?

Not all members of the village administration thought at first that it could be done. Most of the other peasants were frankly unbelieving. A skeptical saying went round: "Our committeemen can only write a few characters. How can they succeed where the old scholar-officials failed?" Only those whose fields would benefit directly, and some of the younger villagers, welcomed the plan. They helped convince the others that it was worth a try.

Some peasants had private reasons for opposition. Liu Chun-chieh, a man in his early fifties whose farm was just by the old dam, was afraid his land would be flooded if it was rebuilt. His objections were overcome only when the village committee and the peasants' association signed a "treaty" with him, guaranteeing to repay any damage.

The village leaders also had to solve the problem of what materials to use and where to get them. Everyone knew that it was useless to reinforce the dam with earth. That had been done before, and it had always washed away. The answer was found when some of the older men recalled that in the river bed, under the old dam, there was a deposit of good, impermeable white clay.

The other question was labour. The people who would get the benefit of the dam, those living by the river, were too few to provide the two thousand man-days needed in a single season. The peasants' association decided to hire additional workers in the village—and to pay them out of rice-stocks confiscated from landlords in the agrarian reform.

#### The Dam Proves Itself

A few days after the 1950 Spring Festival (Lunar New Year), a big crowd gathered for the beginning of the work. Even then, some of the men who had agreed to take part were wavering—what was the use of toiling in the icy water to build a dam that wouldn't last the season? Ku Fan-tsai, a lad of twenty-two who had been enthusiastic about the idea from the start, settled things by wading in first. The others soon followed. But it was only three or four days

later, when the job was beginning to take shape, that confidence became more general.

After the dam was finished, no rain fell for eight weeks. All the ponds in the village ran dry. The sprouting rice began to wither—except in the fields watered by the dam. Here it was strong and green. The dam also provided enough water to irrigate some other fields.

Among the latter was one belonging to Wang Sheng-yu, a poor peasant who grew rice high up on the hillside, where he also had a tiny pool. Because he had hardly ever raised a decent crop, his neighbours had nicknamed him "the Sixth Year of Emperor Hsien Feng" (1857), after a terrible drought year that is still remembered here. Wang was studying at the peasants' school. His classmates volunteered to raise water from the dam to his parched hill-top. They made a bucket-chain, and in two hours had filled his paddy field and saved the young crop.

#### The Ponds Are Restored

After rebuilding the dam, the villagers went on to the ponds. One of the largest, known as Ta Tang (the Big Pond), was almost dry because the outlet of the spring which fed it had been blocked for 30 years. Not far away were two smaller ones, so ill-drained that they overflowed every rainy season and flooded the land around them. Liu Hsueh-shan, the village chairman, took the lead again. He studied the lie of the land and marked out a channel which would conduct the surplus water from the two smaller pools to the big one. He organized the people to dredge them and dig the ditch that was needed. The following year, 1951, the fields around the three ponds—which had produced no rice at all in 1950—yielded a fine crop.

This object lesson caused the whole village to get to work—dredging, channelling and ditching. The problem of lining the irrigation channels was solved by dismantling some deserted ruins in the neighbourhood and using the bricks and rubble. The old roof



tiles, still in very good repair, were sold to buy lime for the mortar.

A small committee was formed for each pond to be cleared; it worked out the plans, saw to the division of labour and supervised the work. The old, fierce competition for water receded still further into the past. On one occasion, when work began on clearing a particularly congested pond, fifty people turned up from a neighbouring village to help. They explained that they had been given water from one of Liuchiatung's bigger ponds during the previous year's dry spell. So they wanted to show their gratitude.

It was after this pond was dug that Wang Sheng-yu, "the Sixth Year of Hsien Feng", finally lost his nickname. He had some barren land close to it, besides his field on the hilltop. Even the help he got after the dam was built had not cheered him up much. Life had knocked the fight out of him. But now he changed almost overnight. Every morning he was the first man in the village to get up. On the job, he was the most energetic worker of all and the first to volunteer wherever others needed help.

Not long afterwards, Wang Sheng-yu joined the newly-formed "Friendship" Agricultural Producers' Co-op. "I didn't do it at once," he tells people now. "But every day when I saw the members going off to work singing, I envied them. It reminded me of the days when we were all repairing the ponds together. And they got things done quicker than I could. So in the end



Liu Hsueh-shan (right), the village chairman, talks with villager Liu Chun-chieh on "Broken Dam", now repaired.

I applied for membership. Now we have dug five new ponds—and they're all full of water".

Another cooperative was formed in 1954. It grew out of the "Beggars' Mutual-Aid Team" set up in 1951 by nine households, as poor as the name implied. Its members had neither draught animals nor farm implements when they began. After organizing for collective work on the basis of the success of the dam and the ponds, they acquired two strong mules and quite a lot of equipment. The "Revival" Co-op, as it is now called, has become the best in the village. Most of its households have surplus grain to sell over and above their own needs.

#### Democratic Distribution

Putting the dam and the ponds in good order provided more water for the village as a whole. To ensure the supply to each field, a democratic system of distribution was organized.

The total number of ponds has been divided into eight sections, each with its own small committee in charge. These section committees work out plans for getting the water to all farmers in the fairest and most economical way. They also arrange extra labour for this when necessary.

A water conservancy committee for the whole village, on which all eight sections are represented, coordinates the general irrigation scheme and plans further additions to the water supply.

Although there was a shortage of rainfall every year between 1950 and 1953, the people of Liuchiatung have gone on reaping better and better harvests. Before liberation, the best rice crop was about 1¼ tons per acre. Today the average is over 1½ tons, while the highest is almost 2½ tons.

The eight groups of ponds have been given new names—"Liberation Ponds", "Mutual-Aid Ponds" and the like. The peasants' association has started to breed fish in some of them. Before the liberation, only four people in Liuchiatung could read or write. By common consent, the proceeds from the sale of the fish are used to support the peasants' school, which now has over 150 students.

The life-giving water, and the democratic changes that made it possible for the people to use it, have transformed life in this village. They have improved crops, changed relationships between human beings, and brought it the light of education and culture.

Ploughing an irrigated wet-rice field preparatory to planting.





# FASHION FORUM

EVER since the liberation, as visitors to China have noticed and readers of *China Reconstructs* know from our photographs, there has been a widespread tendency for men and women in our country to dress alike, in plain cotton jacket and trousers, blue or grey. There were reasons for this at first, but many people have begun to think that they are not valid today. They feel that it is time to change to brighter, more varied, styles and colours. Not long ago, in response to many letters received by its editors, the *New Observer*, a popular fortnightly in Peking, held a forum to discuss how to get people out of "uniform", and what the new fashions should be.

Taking part in the discussion—which was afterwards summarized in print—were a poet, several painters, a pianist and a music critic, a woman trade union leader, a representative of the New Democratic Youth League and two writers from a women's magazine. The participants were invited for their influence on public opinion. Mrs. Ke Yang, the *New Observer* editor who opened the discussion, said it was hoped that they would stimulate some change in the prevailing habit of dressing alike. Some women, Mrs. Ke Yang said, had written that they possessed brighter, more stylish clothes, but were reluctant to wear them because of "what people might say".

## The "Uniform" Habit

Ai Ching, a leading poet, was the first guest to speak. He recalled how the "uniforms" had come in. During the wars against Japan and Chiang Kai-shek, people in the liberated areas lived very austere. Starting with little more than their own burning faith in the people's ultimate triumph, they had built an invincible army, set up a clean democratic system of government and eventually led the

people to the victory which has set China on the path to socialism. They all wore uniforms then, said Ai Ching, and it was right to do so. After the liberation, their spirit of austerity and simple living had a healthy influence on the whole country.

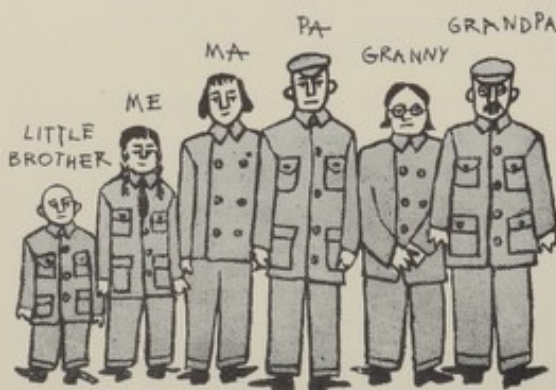
It is already the sixth year since the establishment of the new China, said the poet. There are plenty of goods and there is no need for everyone, men and women, old and young, to dress the same way. But the habit has become difficult to change.

"Some girl students from the art academy came to see me," he said. "Why don't you want to wear pretty clothes?" I asked them. "They said that if you did someone would be sure to make remarks. I said remarks would probably be of delight at seeing something colourful and becoming, and advised them to try it and see.

"Other girls told me," said Ai Ching, "that there was a tendency to think that anyone who dressed smartly was 'backward'—that they thought of themselves, not of helping the country. As if being progressive was dependent on wearing drab colours!"

## Are Nice Clothes Bourgeois?

Han Pin, who works in the Central Committee of the New Democratic Youth League, spoke next.



"Little Sister's Family Portrait", a cartoon from *Hsin Min Wan Pao*, Shanghai, making fun of the "uniform" habit in the cities.

"It's true that many do think that way," he said. "It's one of the main stumbling blocks in this question of dress. When the Youth League criticizes bourgeois ideas, a lot of students and other young people get the idea that dressing well shows a bourgeois outlook."

"Bourgeois people wear handsome clothes to show they have plenty of money," Mrs. Yu Feng, a painter, broke in. "But why should they be the only ones to dress nicely? In a socialist society, people can dress well too. I saw a meeting on a Soviet collective farm in a film, and everyone was very well dressed indeed."

"You're quite right," said Ai Ching. "Here in China we are restoring the palaces and making the streets and the parks beautiful, but somehow we've overlooked clothes. If you look in the streets you see mostly blue and grey—quite inconsistent with the colour in the buildings. Abroad, if six or seven girls go out for a walk, every one of them is likely to have a different hairstyle and dress."

Chang Ting, a painter, had the same view. "Why should our young men and women dress so sloppily and drably when the country is getting more prosperous? They think it's patriotic, but I don't. When I was in Germany I knew an old worker who was seriously ill in hospital. He used to get up in the small hours to shave because his wife would come to see him in the mornings. Now that's a real expression of self-respect!"

"Yes," said Mrs. Yu Feng. "It's poor-spirited to dress carelessly. At present it makes no difference whether we are attending a meeting, going for a long country walk, to a concert or to a banquet; we always wear the same suit. It's very dull."

## How to Change

"When guests from abroad see our operas and plays," said Chou Kuang-jen, a pianist, "they always ask me: 'Your costumes in the past were so beautiful—why do you dress so monotonously now?' They also say that when they go



along the street they don't seem to see any women, because men and women are all dressed alike, and if you don't look at their faces you often can't tell which is which!"

"We can't go back to the past for styles," said Chang Ting. "The standard suit we wear now is a combination of the kind that Dr. Sun Yat-sen wore and the uniform of our People's Army. It came of our recent history and we've got to think of how to reform it with present-day life in mind. Look at the peasants. Their old-style jackets and trousers are all right for work in the fields. The sleeve of the jacket is cut in one piece with the body, and the buttons are made of intricate cloth knots—economical and lasting. Now the peasants are beginning to follow the city workers and go into ready-made uniform suits, which are much less practical. With the kind of hard wear they give them, the buttons pop off and the seams split. I think peasants should stick to the kind of clothes most suited to their work, and so should everyone else.

"When I went to the countryside around Soochow last year, I thought the gay blouses and skirts the peasant girls wore were very becoming. Why shouldn't we copy those? It's in the cities that the main trouble lies. My wife made our sixteen-year-old daughter a flowered frock to wear on the last public holiday, and she looked very pretty. But when she went out she insisted on putting her grey uniform jacket over it. There's public opinion for you."

"It is not difficult to create a new outlook," said Chiang Feng, president of the Central Academy of Fine Arts, who had not spoken up to now. "We must give it a lot of attention in newspapers and magazines. The new clothes should be simple, economical and suitable for different tastes and demands. I think women might wear Chinese-style blouses with trousers or with skirts; or foreign-style



Some new designs by Yu Feng: (left to right) 1. evening dress; 2. Mongolian dress adapted for a school girl; 3 & 4. the traditional gown with a long deep inverted pleat instead of the short slit on each side of the skirt.

one-piece frocks; or the straight, high-collared Chinese dresses,—whichever suits them best."

#### Chinese Gowns—Pro and Con

Mrs. Yu Feng said the straight Chinese gown for women was simple and did not need much material. But its drawback was that it was not convenient for movement. The collar should remain high, though not too high, because Chinese women are not used to a low neckline and it doesn't suit them.

"What I want to see is a lot of colour," she said. "In Fukien province the peasant women wear peach-coloured jackets with wide black trousers, and they look lovely. When they go out to work, they pick fresh flowers every day to put in their hair. You can see they enjoy life!"

Chou Kuang-jen was for the traditional gown. "It makes women look gentle and graceful," he said. "Of course, it is not very convenient to move around in, but as long as you don't run a race or do something like that, it is all right!"

Mrs. Yang Chih-hua, head of the women's department of the All-China Federation of Trade Unions, voiced strong disagreement. "The Chinese gown is no good for working women," she said. "It's too inconvenient. Besides, I don't agree that it's either graceful or beauti-

ful. We don't want uniformity. We do want new styles. But they must be comfortable and becoming without getting in our way."

Chao Feng, a music critic, remarked that a lot of people had criticized the foreign-style clothes worn by women soloists and choruses at concerts. He thought they should have something of a national flavour. "I once met a Bulgarian artist," he said. "She was tall, stout and already middle-aged. She wore an ordinary west-European style black evening dress, but it was decorated with beautiful Bulgarian embroidery in dark red and white silk. That's what I mean by national flavour."

He liked the Chinese gown for women provided it was not exaggeratedly tight or high in the collar. He also favoured a Chinese jacket worn with a short skirt. Long skirts, he thought, should only be worn for formal occasions.

At the end of the discussion, the president of the Arts Academy summed up: "Artists should produce new designs, and fashions should be discussed more in newspapers and journals," he said. "As a basis, we should study peasant and national dress. Everyone should try to help clear away the mental resistance to more varied cut and colour. Then the people themselves will create new styles."



# A Catholic Doctor

YANG SHIH-TA



The author with some of his students at a laboratory in the Second Medical College, Shanghai.

I TEACH at the Shanghai Second Medical College, of which I am a vice-president. I have been a Catholic since my conversion 33 years ago, when I was a medical student in Aurora University, Shanghai. My wife is a Catholic too; she is a women's and children's specialist and works in the Kwang Tzu Hospital, one of the three attached to our college.

Our three children were all baptized in infancy. Marie, the eldest, is 22 and is studying in the Peking Agricultural University. Our second girl, Félicité, is 20 and is at the Hydraulics College at Nanking. The boy, Cyprien, is learning railway engineering at Tungchi University in Shanghai. He is 18 years old. They have been getting their tuition free, with board and lodging—like all university students in China. Our two daughters will graduate this summer and already have jobs waiting for them.

These things may not sound extraordinary in any way. I mention them because prior to the liberation of Shanghai they would have seemed impossible to me. Early in 1949, I remember, we Catholics felt quite panicky. The Kuomintang propaganda was that the Communist Party would destroy religion, burn the churches and persecute Catholics or put them to death. Some Catholic priests and laymen believed these lies and fled the city. I thought of leaving myself, and taking my family to my native province of Kwangtung. I did not think that the revolutionary forces would

ever reach so far south! But in the end, like the majority of Catholics, I stayed where I was.

I have never regretted it. When the People's Liberation Army entered the city on May 25, 1949, we realized that it was a force quite different from what we had been told to expect, and from any we had ever seen or imagined. The soldiers would not accept so much as a cup of hot water from the people without payment. The smooth and efficient way in which they took over the city was astounding to us. The civil administration that was immediately set up impressed the whole population with its scrupulous fairness, justice and incorruptibility.

## Freedom and Equality

There was no persecution of religion, either then or later. Pending the holding of elections and the adoption of a Constitution, the Common Programme of the People's Political Consultative Conference was adopted and put into operation. It laid down that the people of the People's Republic of China should have freedom of religious belief and this has been strictly adhered to. Shanghai, for instance, has over 50,000 Catholics who are served by more than 20 churches. We go to Mass, Benediction and confession exactly as before. All the ceremonies of the liturgical year are solemnly observed. On big feast days it is common to find three or four thousand people attending High Mass at the Cathedral at Zikawei. In the church our family attends,

St. Peter's, at least three masses are offered daily, and five or six on Sundays.

Seminaries in Shanghai, as elsewhere, continue to educate young men for the priesthood. Those who have the call of God are ordained every year.

Representatives of the Catholic Church took part in drafting the new Chinese Constitution last year. Catholic voters, like others, supported its adoption in September 1954. Especially do they cherish the provision which guarantees their freedom of religious belief—Article 88.

I should also mention that the nation-wide elections at that time brought three Catholics into the National People's Congress—the supreme organ of state power in our country. They are Li Weikuang, Acting Bishop of the Archdiocese of Nanking; Hu Wen-yao, who like me is one of the vice-presidents of the Shanghai Second Medical College; and Tung Shao-sheng, industrialist and deputy general manager of the Minsheng Steamship Company.

In addition, many Catholic bishops and priests have been elected by the people as deputies to the provincial and municipal people's congresses. In the Shanghai Municipal People's Congress there are eight Catholics, and I have the honour to be one of them. Among the deputies to local congresses are the 82-year-old Father Tung Huai-an of Nanpu county, Szechuan province, and Father Paul Ho, another priest who has been propagating the faith for over



forty years in Shenchiamen, Chekiang province. There are also many Catholics in the People's Political Consultative Committees and other public bodies.

Catholics do not suffer any discrimination in their work. I for example was given my present responsible position after the liberation. My wife used to be in private practice but now has a good hospital appointment.

At our own college there are 127 Catholic students. They get special help from the administration in the observance of their religious duties. On Fridays no meat is served in any of the dining rooms. In our hospitals, as in all others, priests come and administer baptism, extreme unction or other sacraments to Catholic patients.

#### Religious Instruction

Although religion is not taught in the schools, every Catholic church has a doctrinal class attached to it where children and adults come to learn their catechism and prayers.

We have our own Catholic publications and journals. *The Dove*, a fortnightly published in Shanghai, has a circulation of over 8,000 copies. The fortnightly *Propagation of the Faith*, printed in Tientsin, comes out in booklet form and sells more than 4,000 an issue. Others are published in Changsha, Nanchang and Hankow. A famous Catholic press in Shanghai which has a long history, *L'Imprimerie de Tou-sé-wé*, continues to print missals, breviaries and other religious books, liturgical calendars and holy pictures. It also accepts orders for making vestments, chalices, candlesticks and other objects used in divine service.

I can say truly that it is easier to lead a Christian life now than it was before liberation. Our whole existence is happier and simpler than before. Work is busy and exciting. We have no financial

or other worries about our future, and know that our children's careers are secure.

Moreover, the moral atmosphere is completely changed. Shanghai, formerly notorious for gambling, vice and robbery, is now a clean city. One no longer encounters temptations at every turn.

#### For Justice and Peace

As a Christian, I give my full support to the People's Government, because it is devoted to improving the people's life. As a Chinese, I uphold it because it has made our country independent at last. Even as a boy I was expelled from a foreign-run high school in Shanghai for being active in student activities at the time of the patriotic May Fourth Movement of 1919. Now we can be good Catholics and act for our country's benefit and honour, without fear of any kind.

Among Chinese Catholics, as in the country as a whole, there was a small minority of oppressors and exploiters like the young man in the Gospel of St. Matthew, who turned away from the true path because "he had great possessions". For selfish reasons, they did not like what was good for the common welfare. A few, sometimes in collaboration with imperialist agents, have engaged in subversion against our country and people. Like any other law-breakers they have been punished, while a number of foreign priests who meddled in our politics have been deported. Such action was taken on proof that religion was being used to cloak illegal acts. When the Shanghai authorities arrested two Belgian priests in Shanghai, for instance, the incriminating evidence included a liturgical calendar with a picture of Our Lady on the cover and a secret code for intelligence use inside. Invisible ink for writing hidden messages was also found.

Such activities are totally unrepresentative of the feelings of the vast majority of Chinese Catholics who rejoice in the beneficial changes taking place in our land. The steps taken to stop them have the support of our Catholic opinion.

We find no contradiction between our patriotism and our Faith. Chinese Catholics participated in aiding invaded Korea and defending our own borders against American aggression—and thus stood up for right and justice. To uphold love and oppose killing is to do God's will. Therefore we Chinese Catholics, both clergy and laymen, believe that all Christians everywhere should take part in the campaign for the abolition of atomic weapons and of the world peace movement generally. Catholics have represented China in many international peace conferences. I myself was a delegate to the World Assembly for Peace at Helsinki this year.



Bishop Tsung Huai-mo ordains a priest, the Rev. Shih Yu-kun, at the Peitang Cathedral, Peking, on July 10, 1955, before a congregation of over 2,000.





# SPORTS

## Swimmers to the Fore

WITH facilities that have increased tremendously since the liberation, swimming is claiming an ever-increasing number of followers in China. It is beginning to vie with football and basketball as a big-time sport. And our champions are steadily closing the wide gap that once separated Chinese from world standards.

At the time of writing, swimmers all over China are in hard training once again for the annual national gala. They are hoping to better the fine achievements of the 1954 national meeting in Canton. There every single pre-liberation record and fifteen post-liberation ones were smashed.

### 1954 Achievements

It is the general opinion among athletes that these 1954 successes were due in large part to the presence, as guests, of world-renowned Soviet champions — Egorova, Ageyeva, Arkatyeva, Klipova, Edasi, Sorokin and others. Our friends participated in the various events *hors concours*, and

the hot pace they set inspired China's own swimmers in their record-breaking achievements.

With the top student athletes away participating in the Twelfth World University Games at Budapest in August 1954, most of the record-breakers were workers and People's Liberation Army men. The 19-year-old building-worker Liang Shu-mei, for instance, took both the 100- and 400-metre free-style events for women.

Our soldier-sportsmen won 12 out of the 13 men's events. Only the 400-metre free-style was won by the Central-South China regional team, whose Lin Li and Tan Chi-hsiung, the latter a peasant, scored a sensational upset over the army swimmers in the finals.

Showing the benefits of lessons patiently imparted to them by the touring Soviet swimmers, the new national champions further improved their records in friendly exhibition contests with the visitors in Peking and Shanghai.

In Budapest, the members of the student Chinese team competed creditably with such world champions as Tumpek and Utasi of Hungary and Menashkin of the Soviet Union. When Tumpek set a new world record for the 100-metre butterfly stroke in

1 minute 2.3 seconds, Wu Chuan-yu of China came second in 1 minute 7.1 seconds.

China also placed second in the men's 100-metre backstroke, third and sixth in the men's 100-metre crawl, and fourth in both the men's and women's 4 × 100-metre medley relay.

### This Year's Activity

This season in China, many more people are swimming and opportunities for training have multiplied. Fourteen large new centres are being built in Chinese cities this year alone. Peking is to have a new indoor pool and a four-pool centre with stands seating 6,000. In Shanghai an existing centre is being greatly enlarged for the forthcoming national gala. Additional new pools are being constructed in Tientsin, Sian, Wuhan, Taiyuan and Nanking, expanding the facilities in these cities.

Even before the holding of this year's national gala Huang Lien-hua, a girl student in Shanghai, broke the women's national 100-metre free-style record in an early season try-out.

Below we give some national records set by Chinese swimmers, excluding those not yet officially ratified. Pre-liberation record times are included for purposes of comparison.

	Men's	New Record	Old Record
100 m. backstroke		1'6.4"	1'16"
100 m. butterfly		1'7.1"	none
100 m. breaststroke		1'11.8"	none
100 m. freestyle		1'0.3"	1'3.3"
200 m. breaststroke		2'43.5"	2'56"
	Women's		
100 m. butterfly		1'22.4"	1'41.8"
100 m. freestyle		1'14.4"	1'20.6"
4 × 100 m. medley relay		5'38.1"	none



(Left)  
Liang Hui-piao, 1954 national diving champion, at practice in Canton.

(Right)  
The North China women's team which set the national record for 4 × 100 m. free-style relay in 1951







## Peasant Heroes in the Liberation War

### Film Notes

**S**HACHIATIEN *Grain Station* is a powerful film based on the novel *The Wall of Bronze*, by Liu Ching.\* It takes us back to a historic moment in the War of Liberation in the summer of 1947. The population and the people's forces in northern Shensi province were undergoing a fierce ordeal. Hundreds of thousands of U.S.-equipped Chiang Kai-shek troops were pouring in. The liberation army had retreated from Yen-an, the revolutionary centre, and was grouping for large-scale counterattack. Provisions were a desperate problem, and the Shensi peasants put up a heroic struggle to protect their grain from the enemy so that the people's soldiers could have food.

### Story of the Film

The film tells the story of a group of villagers in the village of Shachiatien. A grain supply station has been set up, to which the peasants come from all around with grain for the troops. From time to time the army sends pack-trains to collect what it needs. The grain is stored in a cave in a narrow ravine, to protect it from discovery.

The supply post has some ten tons of grain. The responsibility for its protection has fallen on Shih Teh-fu, a resolute and level-headed young man who leads the village home guard. The enemy has already occupied the next county and is advancing. All the able-bodied men have started for the front and the village people for hideouts in the hills. Four men are left with the grain: Shih Teh-fu, his helper Pa Hu, a former liberation army man who has lost

an arm in battle, Shih Yung-kung who keeps the books, and the village carpenter.

The local landlord, grown bold, tries to set fire to the grain station, but is foiled. Shih Teh-fu makes his way through a blinding storm to the front to ask the army what to do to keep the grain from the enemy. The people's forces agree to collect half the grain that night. They ask the peasants to take the rest away and hide it safely.



Shih Teh-fu and the book-keeper (left) hide in a sorghum field after rescuing the grain accounts.

As the storm continues, the men at the station wait impatiently for the army provision team. Just before dawn they learn that swollen mountain torrents have blocked the way so the pack-train cannot get through. There is not a moment to lose. It is decided to take the grain to the hills.

### Defying the Enemy

Scarcely half the job has been finished before the enemy's advance guard enters the village. Shih Teh-fu and his men, having mined the approach to the cave, hide themselves in a sorghum field nearby. The enemy stumbles on

the mines, which go off. In the ensuing confusion, the villagers recapture the cave and rush off the last of the grain.

After the main enemy force arrives, Shih Teh-fu runs back to the grain post to get the account-books which the timid accountant has forgotten to bring. He is wounded and taken prisoner, but not before he has hidden the books safely under a tree.

The Kuomintang soldiers search the village for food. They torture Shih Teh-fu and other captives to make them tell where the grain is hidden. But not one of the peasants will speak. Old man Ching Liang answers his tormentors with hatred and scorn: "Grain is for the people, not for beasts like you!"

During that night, Shih Teh-fu and his companions manage to free themselves from their bonds and escape. As dawn breaks Shih Teh-fu, struggling up the hill to get the account books out from their hiding place, suddenly hears the boom of artillery. As the early morning mist clears, he sees the red flags streaming in the breeze as the liberation army advances through the fields. The counterattack has begun! And the grain is all safe.

### People's Heroism

This film is a stirring and true-to-life story of the heroism of the Shensi people. It contains many moving incidents. When Shih Teh-fu takes the last bag of grain in his home for the army, his mother has nothing for the family's next meal but a few wild roots. "Take the grain," she says, her eyes full of tears, "so that they can win."

Chinese critics have pointed out that the film has some faults of over-simplification in both scenario and acting. Its merit is that it conveys a sense of the indestructible force of the people in the Liberation War—that "wall of bronze" which, in the words of Mao Tse-tung, "is the people, the hundreds of millions who genuinely and sincerely cherish the revolution".

\*The novel has been published in English by the Foreign Languages Press, Peking, 1954, pp. 233.



# STAMPS OF NEW CHINA

**L**AST March and April, the currency hitherto in use in China was exchanged for new currency at the rate of 10,000 old *guan* for one new *guan*, which contains 100 *fen* or cents. The internal postage rate changed, at the same time, from ¥800 (old) to 8 *fen* (new).

It will help collectors to know the Chinese characters for these currency units. They are

圆 *guan* and 分 *fen*

The first new stamps in the new denominations were issued in June and July. They are described below.

## Red Cross Anniversary Commemorative

This issue marks the completion of the fiftieth year of the existence of the Red Cross Society of China.



The stamp, with a face value of 8 *fen*, is recess-printed in grey-green, with a red cross intaglioed in red in the upper left-hand corner. The design is of two factory health workers, a man and a woman, against the background of industrial buildings. The anniversary dates 1904-1954 appear under the red cross. The bottom margin is inscribed: "In Commemoration of the Fiftieth Anniversary of the Establishment of the Red Cross Society of China."

The Society, which was founded in 1904, was reorganized in 1950 as a truly popular body with a greatly extended range of work. It maintains many hospitals, tuberculosis sanatoria and maternity homes, has trained tens of thousands of people in industrial and general first-aid, conducts mass public health education and is active in anti-epidemic work. It has a large Junior Red Cross membership in the schools.

The Red Cross work has helped cut down the rate of epidemic diseases and of infant mortality in the national minority regions, formerly almost devoid of medical services. During the Korean war, it did medical work among the wounded, regardless of nationality, as well as among civilians. Later it assisted in the repatriation of prisoners-of-war. It was also responsible for the repatriation of thousands of Japanese residents and ex-prisoners-of-war. During recent years it has sent several delegations to international Red Cross conferences and to visit Red Cross societies in other countries.

Size: 22 × 37 mm. *Perf.* 14.

## Commemorating the Fifth Anniversary of the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance

In the five years since its conclusion in 1950, the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance has proved a powerful stabilizing force for peace in the Far East and the world. It has served as the basis for ever-widening economic and cultural cooperation between the two fraternal countries, with a combined population of 800 million people.

The present set, consisting of two stamps, commemorates its fifth anniversary and gives a symbolic portrayal of its consequences for China's industrial development.



The 8 *fen*, red-brown, shows Stalin and Mao Tse-tung in the Kremlin during Chairman Mao's 1950 visit to Moscow, at

the time the treaty was signed. It is a reproduction of the oil painting, "The Great Friendship", by D. A. Nalbandyan. The bottom margin reads: "In Commemoration of the Fifth Anniversary of the Conclusion of the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance."

Size: 31 × 37 mm.

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The two figures stand in front of a big blast furnace. The design is from a poster by Li Tsung-tsin. The Soviet Union is assisting China to set up or reconstruct 156 major industrial projects, mainly in heavy industry, which form the core of the present Five-Year Plan. The legend is the same as on the 8 *fen*. Size 27 × 33½ mm.

Both stamps are recess-printed. *Perf.* 14.



## IMPORTANT NOTICE

"Folk Songs from China", mailed with this issue, is our second supplement this year (the first was a catalogue of postage stamps of the People's Republic of China). A third supplement, showing specimens of the peasant folk art of paper cut-outs, will appear with our December issue.

These supplements are not sold separately from the magazine. The only way to be sure of getting a complete set is to become a subscriber to our journal.

Individual copies of the September 1955 magazine, plus the supplement, are procurable from local dealers or from us direct at the price of a single copy.

Several supplements will also be published in 1956.

## Our Contributors

**PIEN JEN-KENG**, veteran commercial pilot, now heads the passenger and freight service of the Civil Aviation Administration of China (CAAC).

★

**CHANG JEN-HSIA** is professor of the History of Art at the Central Academy of Fine Arts in Peking. He taught in the Chinese Department of the International University at Santiniketan, India, from 1944 to 1948. His book, *Chinese Classical Arts*, was published in Peking in 1954.

★

**YUNG LUNG-KWEI** is a well-known economist engaged in research on industry and international economic problems. He received his M.A. degree from the Nankai Institute of Economics, then located in Chungking, in 1941.

★

**MO TSUNG-CHIANG** is assistant professor of architecture at Tsinghua University, Peking. He is a specialist in the architecture of the Sung dynasty (960-1279).

★

**LI TAO**, professor of the History of Chinese Medicine at the Peking Medical College, is a Fellow of the new Academy for Research in Chinese Medicine.

★

**YANG SHIH-TA**, vice-president of the Shanghai Second Medical College, is a delegate to the Shanghai Municipal People's Congress. He became a Catholic 33 years ago. After completing his medical education in China, he studied at the Graduate School of Paris University.

★

**TAN AI-CHING**, author of "Water for Liu Village", is a staff writer for *China Reconstructs*.

## CORRECTION

In the article "Broadcasting for the People", which appeared in the August issue of *China Reconstructs*, the third sentence in the last paragraph on page 5 should read: "Power will be stepped up further and 11,500 additional 'monitoring posts' are to be set up . . ."



## Our Postbag

### Passed Unanimously

I am forwarding a cutting from the daily paper *Guardian*, published in Ceylon, of a resolution that was introduced by me at the monthly meeting of the Horawala-Matugama Village Committee. In addition to what is printed, I proposed that no Ceylon bases should be given to Americans and all American and British armies should be withdrawn from Ceylon; that A- and H-bombs should be banned, and that Formosa should be returned to China.

UPALI ABEYGUNAWARDENA  
Matugama, Ceylon

(The clipping read in part: "He (Mr. Abeygunawardena) moved a resolution that the Prime Minister be requested not to sympathize with America on behalf of the people of Ceylon regarding the U.S. attitude towards Formosa . . . The resolution was unanimously adopted.")

### Australian Seaman

I am a seaman and do not usually come into the same contact that others do with people in everyday life. I have intro-

a case. The government has re-introduced import restriction laws at a time when we could trade with your country for our mutual benefit.

KEITH LE LEU  
Hobart, Tasmania, Australia



### Painted Faces In India

A peaceful Holi festival was celebrated in Jodhpur (Rajasthan) on the basis of 'Painted Faces' of the Chinese Theatre (printed in your magazine).

The public of Jodhpur enjoyed this national festival and appreciated this new method of celebrating Holi.

The people of Jodhpur were attracted by these painted faces. Photos were taken and we are sending you two now.

people here—who are indoctrinated by false information from official U.S. and Kuomintang sources which are, to say the least, "very active" in spreading their propaganda among the Indonesians as well as the Overseas Chinese.

This propaganda specializes in claiming that in China today there is a persecution of people believing in any religion. But I think that after reading some explanations in *China Reconstructs*, *People's China*, and the book *Moslems in China*, as well as Article 88 of the *Constitution of the People's Republic of China*, everybody with some common sense will understand the facts at once.

Some days ago I gave a lecture for Catholic students about "Religion in China". It was amazing to see how glad they were to know something of the truth, to hear something other than the never-ending anti-Communist propaganda. So I think it would be quite useful if they read your magazine.

KWEE HIN HOUW  
Y.M.C.A. High School Secretary  
Djakarta, Indonesia

### Eradicating Anthrax

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#### CANADA

\*The Canadian Far Eastern Newsletter, 134 Glenholme Ave.,  
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People's Cooperative Bookstore, 337 West Pender Street, Van-  
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### ISRAEL

"Lotos", Ltd., P. O. Box 4550, Tel-Aviv, Reh. Hakovshim 19/11  
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# STAMPS OF NEW CHINA

LAST March and April, the currency hitherto in use in China was exchanged for new currency at the rate of 10,000 old *guan* for one new *guan*, which contains 100 *fen* or cents. The internal postage rate changed, at the same time, from ¥800 (old) to 8 *fen* (new).

It will help collectors to know the Chinese characters for these currency units. They are

圆 *guan* and 分 *fen*

The first new stamps in the new denominations were issued in June and July. They are described below.

## Red Cross Anniversary Commemorative

This issue marks the completion of the fiftieth year of the existence of the Red Cross Society of China.



The Red Cross work has helped cut down the rate of epidemic diseases and of infant mortality in the national minority regions, formerly almost devoid of medical services. During the Korean war, it did medical work among the wounded, regardless of nationality, as well as among civilians. Later it assisted in the repatriation of prisoners-of-war. It was also responsible for the repatriation of thousands of Japanese residents and ex-prisoners-of-war. During recent years it has sent several delegations to international Red Cross conferences and to visit Red Cross societies in other countries.

Size: 22 × 37 mm. *Perf.* 14.

## Commemorating the Fifth Anniversary of the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance

In the five years since its conclusion in 1950, the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance has proved a powerful stabilizing force for peace in the Far East.

the time the treaty was signed. It is a reproduction of the oil painting, "The Great Friendship", by D. A. Nalbandyan. The bottom margin reads: "In Commemoration of the Fifth Anniversary of the Conclusion of the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance."

Size: 31 × 37 mm.

The 20 *fen*, olive-brown, depicts the brotherhood between Soviet specialists invited to China and the Chinese workers they are helping in the task of industrialization.

The two figures stand in front of a big blast furnace. The design is from a poster by Li Tsung-tsin. The Soviet Union is assisting China to set up or reconstruct 156 major industrial projects, mainly in heavy industry, which form the core of the present Five-Year Plan. The legend is the same as on the 8 *fen*. Size 27 × 33½ mm.

Both stamps are recess-printed. *Perf.* 14.



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SELECTED EXCERPTS FROM REVIEWS OF SCIENCE AND CIVILISATION IN CHINA (Vol. 1), by Joseph Needham, F.R.S., with the research assistance of Wang Ling. (Cambridge University Press, published September 1954).

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"It is not difficult to point to aspects of Chinese civilisation that have not received the attention they deserve in the West, but few have been so important and at the same time so neglected by both native and foreign scholars as science . . . We must be all the more thankful, therefore, that Dr Needham has turned from his biochemical specialisation to the immense task of learning Chinese, of gathering together the elusive and scattered material on this vast subject, and of composing it into a multi-volumed book . . . We may expect new insights and generalisations . . . The heroic magnitude of the enterprise makes minor flaws insignificant . . ."

Victor Purcell; New Statesman & Nation

"Hitherto the contribution of the Far East, and especially of China, to scientific thought and technology, has been unrecognised and clouded in obscurity. Dr Needham's work is a pioneer attempt on the grand scale to remedy this situation . . . The first volume not only exhibits a combination of expertise that has hitherto not existed in any one person, but it is written with admirable lucidity and detachment . . . Even now it is safe to say that after the publication (of the whole of this book) the Western attitude towards China can never be quite the same again. It is bound to be altogether better informed and therefore more understanding."

C.R. Boxer; International Affairs

"This first volume forms a worthy introduction to what promises to be a monumental work in the best sense of the word, and the appearance of its six successors will be impatiently awaited."

Maurice Collis; Time & Tide

"Dr Needham's approach to the subject is that of a scholar who is intimately acquainted with the Chinese language and literature, including the vast spread of its printed books . . . A massive and comprehensive contribution to Chinese studies."



David Hawkes; Hibbert Journal

"Dr Needham has undertaken no less a task than the systematic investigation of the Chinese contribution towards all those discoveries and developments on which are based the power and amenities of modern civilised man . . . But he is attempting even more than that; he is attempting to introduce the reader to a whole civilisation - one, moreover, which has now been in continuous development for more than 3000 years. So vast an undertaking might seem too great for one man (or rather, two, since Dr Needham gives generous prominence to the name of his Chinese collaborator). Yet, as he says himself, he is a rare bird; a scientist interested in the history of science, and at the same time one having both a direct knowledge of China and the ability to read Chinese sources . . . This volume should be read by every educated man."

E.J. Holmyard; Endeavour

"Dr Needham is uniquely equipped for the task (of producing the authoritative work on this subject); an eminent scientist, a practical writer on the history of science, and a sinologist with a knowledge of the language and the people, he has the full armoury not only desirable but requisite . . . It is a book to be read by everyone interested in the development of science and civilisation."

Conway Zirkle; Scientific Monthly

"Though Vol. I is only the overture to a major opus, it is enough to show that our knowledge of China and Chinese culture will be on a much higher plane when all seven volumes are published . . . For the first time, a really comprehensive history of science in China will be recorded in a single work . . . Dr Needham is obviously competent (for the task). He lived in China for many years, he is a sinologist as well as a biochemist and a historian of science. His scholarship is adequate for his complicated task and he evidently loves his subject. I can only express my impatience for the remaining volumes to appear."

James R. Newman; Scientific American

"Dr Needham's survey promises to be a landmark of intellectual history . . . It is clear that a scholar who undertakes such a task (as his) must possess extraordinary equipment. Dr Needham is such a one. He is a biochemist distinguished for his original researches and writings; he has an excellent grasp of the history of science and its connections with social history; he has travelled extensively in China and has a good working knowledge of the language; he is a bear for work, and a veteran in handling masses of detail without losing perspective or a sense of humour. Further, he loves the Chinese people, and his feeling - not sentimental but based on understanding and respect - pervades his book. The work has been pursued, he tells us, as a contribution to international understanding, in the spirit of the great 17th century English scholar, Lancelot Andrewes, of whom a biographer said that he might 'well have been (if then living), Interpreter-General at the Confusion of Tongues' . . . The book lays the foundations of a magnificent survey; a triumph of thought and research. It is a book which, in Robert Hooke's words, will 'lay open to us an Empire of Learning, hitherto only fabulously described', and admit us to converse with the best and greatest of that Empire, that either are, or ever have been.'"



N.W. Pirie, F.R.S.; A. Sc. W. Journal

"This is a magnificent appetite-whetter. There are six more volumes to come, and the first not only establishes a foundation of general knowledge on which to put the promised structure, but makes us very impatient to see it. Dr Needham's polymathy and capacity to hold in one head a vast range of information have always perplexed those who know him. These faculties have never been better displayed or deployed, for no one since Gibbon has attempted such a feat of comprehension and coordination as this."

A.J. Ayer; Observer (Outstanding Books of 1954)

"The prolegomenon to what is evidently going to be a major work of scholarship."

Unsigned review; Times Literary Supplement

"It is of China's contribution to human knowledge in the domains of science and technology that Dr Needham writes in what cannot but be described as a monumental work, for the volume under review is only the first of seven . . .

The bare enumeration of the subjects treated indicates that the work is encyclopaedic in scope. That there should be so much to be said on the different aspects of science in China is astonishing, but more astonishing is the fact that the seven volumes, of an average length of more than 300 [actually 500] large pages, represent the pioneering effort of one individual. It is true that Dr Needham has had the research assistance of Mr Wang Ling (of Academia Sinica and Trinity College), and that he gives the names of a long list of experts in various special fields who have read through in draft form the sections touching upon their special interests, but the work remains essentially that of a single individual. It is natural to ask whether in the circumstances sketchiness of treatment can be avoided, but Dr Needham is uniquely equipped to accomplish single-handed what would ordinarily require a well-organised co-operative effort on the part of many minds. He is, in the first place, a philosopher-scientist, bringing to his task the close eye for detail and the inductive powers of the empirical scientist, and at the same time the synoptic vision and concern for fundamental principles which characterise the philosophical outlook. That he has also a strong historical sense the present volume proves. In addition, he has resided for several years in China, where he was engaged in research [actually scientific liaison] work; and has a knowledge of the Chinese language adequate for the purpose of drawing much of his material direct from original untranslated sources. Dr Needham modestly refers to his work as a mere reconnaissance, but this is surely an understatement of such a detailed survey on a grand scale of entirely novel territory . . .

(Thus) Dr Needham's work is not only valuable from the point of view of scientific scholarship but is an important contribution to international understanding."

Unsigned review; Economist

"It seems quite extraordinary that one man (with whatever competent help) should set about obtaining a thorough grasp of the vast mass of writings on every subject in which may be embedded some nugget of information bearing directly or indirectly on the subject of science and civilisation in China. The material includes not only what has been produced in China itself through more than two millennia, but also the works of sinologists in several Western languages in the last



two centuries, not to mention writings in other Asian languages. That the results should eventually fill seven large volumes is not so surprising; but it is remarkable that after carefully evaluating the reliability of all these sources, the author's findings should be presented so lucidly. Indeed, there are in this volume not more than one or two paragraphs that present any difficulty to a reader completely without scientific training . . .

Dr Needham's work definitely supersedes all earlier explorations."

W.A.C.H. Dobson (Toronto); Antiquity

"This book promises to be a tour de force . . . The range and scope of Dr Needham's researches startles a conventional sinologist . . . Whatever his final conclusions may be, it cannot be said of him, as a sinologist so often has to say of an occidental author writing on Chinese themes, that he failed to consult and avail himself of the existing works of scholarship, not only those in Western languages, but often more important, those in Chinese and Japanese."

S. Adler; Economic Journal

"The author possesses the inestimable advantages both of encyclopaedic equipment as a scientist, historian of science, and sinologist, and of first-hand knowledge and perceptive grasp of Chinese society, and, to use Lattimore's felicitous phrase, of 'the Chinese style of life'. This union must surely be unique. Others have enriched Far Eastern studies by the accumulation of monographs on circumscribed subjects, or, as in the case of Weber, or Veblen in his all too brief and little known essay on Japan, by the brilliance of the individual and perhaps un-coordinated aperçus into social structure. Dr Needham, ably assisted by Mr Wang Ling, combines in this work not only the laborious fact-finding of the monograph and the grand sweep of the broad canvas, but also the vision of an alien culture and civilisation from within, without which the latter remains incomprehensibly remote."

S. Adler; Cambridge Review

"Dr Needham is perhaps the only person in the world, East as well as West, with all the qualifications for this task. His magnum opus, when completed, will provide a comprehensive account of Chinese science and technology, together with an assessment of its place both in the broad stream of (world development of) science and technology, and in its own social and cultural milieu. His encyclopaedic project necessarily involves meticulous historical research at each stage, and a capacity for synthesis of the highest order, if author and reader alike are not to be swamped in the 'dark chaos of material'.

'Science & Civilisation in China' is not only a mine of information; it also reveals and suggests connections where they were previously only vaguely if at all suspected. Not least, it is persistently stimulating and provocative . . . Dr Needham has made an outstanding contribution of the greatest cultural significance, first to sinology, second to the annals of science and technology, and third to the history of ideas."

K.A.N. Sastri; Journal of Indian History

"Dr Needham's work, when completed, as we hope it soon will be, will be another monument of English scholarship which will take a secure place beside Frazer's 'Golden Bough', Toynbee's 'Study of History', and other works of this kind."