

# NEEDHAM RESEARCH INSTITUTE NEWSLETTER

Newsletter No. 4

EAST ASIAN HISTORY OF SCIENCE TRUST

June 1988



## BENEFACTIONS

### THE SOUTH WING

When the Duke of Edinburgh visited the Institute in June 1987 he was able to see two of the three parts of the building that had been planned, and it was explained to him that steps were being taken to raise the money required for the final wing, on the south side. The need for such a wing had been envisaged from the outset, in order to provide accommodation for the visiting scholars whose co-operation has always been of the greatest value to the Institute and its projects. It is therefore with deep gratitude that the Institute expresses its thanks to the Kresge Foundation for its promise of \$250,000 for building the last stage of the premises. The gift is conditional on the Institute finding the sum of \$278,136 before 1 February 1989; when that happy day arrives, orders can be given to the contractors to proceed. The Institute is particularly appreciative of the generosity of the Kresge Foundation, which usually prefers to support building projects within the United States of America.

Thanks are also due to those bodies which are continuing to provide grants, sometimes on an annual basis, to promote the research on which the Institute is engaged; these bodies include the Cambridge University Press; the Mellon Foundation; the Luce Foundation; the National Association for Research Advancement (Japan); and the National Science Foundation (USA).

## STAFF NEWS

Mrs Diana Brodie who has played an active part in the work of the Institute for twenty years, is resigning from her post as administrative assistant and secretary from July 1988. She carries with her the best wishes of the Institute for her new assignment which will concern children's problems and their educational needs, in which she has long been interested.

## THE PRODUCTION OF TEXTILES IN THE SOUTH-WEST



This scene, of which a photograph has only recently become available, is taken from a lid of one of seven bronze drums excavated at Shih-chai-shan, Kunming, Yün-nan province. The site has been identified as the cemetery of the kings of Tien, whose title was first recognised by the Han emperors in 109 B.C. The modelled scenes of religious, social and military activity, or of daily occupations, which appear on the lids, provide valuable evidence of the way of life of the different ethnic groups in the region, who were as yet not assimilated to Chinese culture. From this and from literary records it is known that they practised both agriculture and stock-breeding; they worked the bronze from copper and tin found in local deposits to fashion musical instruments and weapons of war; they used gold, silver and jade economically, for ornamentation; and they produced wares of pottery, lacquer and leather. Textile production was left to the women,

who worked under the supervision of an overseer (also female), to whom the finished cloth was shown for approval. Artifacts found at the site include whorls made of pottery; for early techniques evidenced at other sites in China, see *SCC* volume 5, Part IX, pp. 90f., 142f. Scenes on the lids of three other drums depict rites which included human sacrifice, and suggest that the snake was an object of worship.

The original report of the site (Peking: *Wen-wu* Press, 1959) has been followed by the publication of a splendid volume of photographs with articles on the historical and cultural background (*Yün-nan ch'ing-l'ung ch'i*; Peking: *Wen-wu* Press, 1981). An English edition of this book is now available as *The Chinese Bronzes of Yunnan*, Foreword by Jessica Rawson (London: Sidgwick and Jackson Limited, and Beijing: Cultural Relics Publishing House, 1983).

*Photograph reproduced by kind permission of Sidgwick and Jackson.*

## VISITORS

The Institute has been glad to welcome the following visitors in recent months: Professor Chen Weihang (Wuhan); Professor Chen Char-Nie (Chinese University of Hongkong); Professor Chu Tsung-Hsiang (Beijing); Euan and Susan Cooper-Willis (Portmeirion, N. Wales); Professor B. Damdin (Ulan Bator); Dr Alistair Duncan (Loughborough University of Technology); Mr Robert Fraser (East Kilbride); Professor Fang Ming-Yuan (Szechuan); Professor F. Hirzebruch (Bonn); Professor Huang Jen-Yü (New Paltz, New York); Professor Kim Yung-Sik (Seoul); Professor Lee Kyong-Sik (Seoul); Professor Lo Hui-Min (Canberra); Professor Lu Chia-Hsi (Beijing); Professor Marc De Mey (Ghent); Professor Nakaoka Tetsurō (Osaka); Dr Mario Réal de Azua (Mexico); Professor Shih Chung-Pên (Beijing); Dr Sumet Jumsai (Bangkok); Professor Sun Shu (Beijing); Professor Wang Chih-Fu (Kunming); Professor Harry Woolf (Princeton); Professor Robin Yates (Harvard).

## FORTHCOMING EXHIBITION

The Institut Chine-Europe and the Catholic University of Louvain have organised an exhibition which is to be held at the *Musées Royaux d'Art et d'Histoire*, Brussels, from 16 September until 16 January 1989. Under the title of *Chine, Ciel et Terre: 5000 Ans d'Inventions et de Découvertes*, the exhibition takes as its theme the development of science and technology in China past and present. There will be more objects on display than those shown at a comparable exhibition which was held in north America recently, and craftsmen from the People's Republic will be present to demonstrate some of the techniques which were used in some of China's characteristic products. Further information may be obtained from the Commissariat-Général à la Coopération Internationale de la Communauté Flamande, Rue de Trèves 100, 1040 Brussels, Belgium (telephone: 02/230 12 25).

# JOSEPH NEEDHAM AND THE TAOIST CANON

The Ming dynasty *Tao-tsang*, or Taoist Canon, is one of the most remarkable examples of traditional Chinese publishing. The concept of such a canon, ranging together all works of Taoist inspiration, may be traced back to about a millenium before the only surviving edition of 1445, though until the early twelfth century, when the emperor Hui-tsing ordered an edition to be printed, it was only compiled in manuscript form. Its most complete edition was apparently that produced under Mongol rule, but after the Taoists were defeated by the Buddhists in a court debate over the merits of their two religions Kubilai Khan in 1281 ordered that the Canon should be destroyed: only one or two fragments from this period remain.

The Taoist Canon has indeed always been overshadowed by the more frequently printed Buddhist Canon. This in its largest pre-modern edition included over two thousand separate texts, as opposed to rather more than fourteen hundred in the Ming Taoist Canon, if one includes a supplementary section added in 1607. But roughly three quarters of the Buddhist Canon consists of translations from languages other than Chinese – principally Sanskrit – whereas the Taoist Canon is a purely Chinese product, incorporating texts from all earlier periods of Chinese history. The *Tao-tsang chi-yao*, an anthology from the Canon last edited in 1906, even adds some works down to the nineteenth century. Yet even in its original form the Canon was the largest repository of Chinese texts ever printed by traditional means – any larger collections, such as the *Ssu-k'u ch'üan-shu* discussed in Newsletter No. 2, were transmitted only in manuscript.

The Canon is in fact a veritable treasure-trove, where one may find works of ancient philosophy cheek by jowl with others on medicine, divination, topography and alchemy, to say nothing of works of more obviously religious content. But it was a treasure-trove to which remarkably few people ever gained access. The Taoist abbots whose institutions were favoured with the gift of a copy by the emperor, its publisher, seem usually not to have encouraged visits from would-be readers. Some of the texts giving

details of Taoist rituals represented the livelihood of Taoist families, in which manuscript copies were jealously guarded as heirlooms passed from father to son. Making the printed versions available would have allowed those without a Taoist training to set up as rivals in business – and in the hands of a non-initiate some of the magical formulae used were probably felt to be very dangerous indeed. Several *bona fide* scholars were permitted to consult the Canon so that they could prepare editions of some of its writings that are of a philosophical or topographic interest, but such scholars were precisely the sort of people not to be concerned with religious matters.

By the beginning of this century the situation had changed somewhat: Chinese scholars had started to take a closer look at the Canon, and French scholars had bought up two rather incomplete sets so that Taoist studies could get under way in Paris. Complete sets, however, had over the years dwindled away so that only two or three were left in the whole of China, while even the Imperial Library in Japan had no more than an incomplete copy. In the early 1920s a group of eminent bibliophiles became so concerned about the rarity of the Canon that they banded together to arrange its reprinting by photolithography through the Commercial Press of Shanghai: the whole process took from 1923 to 1926 to complete.

It was the circulation of this reprinting which made the development of modern Taoist studies

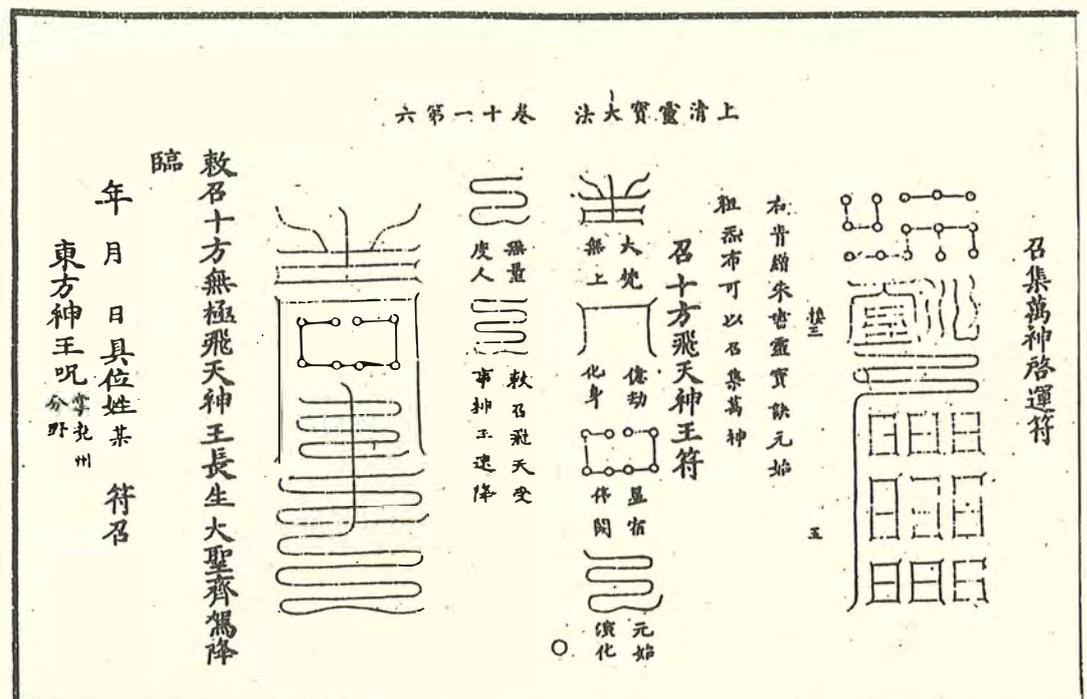
possible – and, foremost among European researchers into the Canon, Joseph Needham has demonstrated just how valuable a source it is for the study of Chinese science. True, he was anticipated in this by that peerless translator, Arthur Waley, who as early as 1930 – long before much better-known students of the Canon such as Henri Maspero had begun to publish – demonstrated the way in which it might be used to trace the history of Chinese alchemy. In the following year, in the introduction to a study of Taoism in Mongol times, Waley remarked on the curious reluctance of other scholars to follow him in exploiting the resources newly available to them, but his lack of British fellow-researchers at least was no mystery, since outside London no libraries had acquired copies of the Canon.

Indeed, one Chinese bibliographer who visited Oxford in 1936 accounted the lack of a Taoist Canon one of the major deficiencies in the Bodleian at that time, and he would have had to pass the same judgement on Cambridge, too. But from 1938 Cambridge did have a Professor of Chinese who would have been fully aware of the disadvantages that this lack entailed. This was Gustav Haloun, Joseph Needham's first mentor in Classical Chinese, who had at an earlier stage in his career devoted considerable efforts to building up the Chinese collection at Göttingen, and who was already using the Canon in his work on early Chinese texts. So it is no surprise

to find that Cambridge University Library, under Haloun's guidance, was soon looking for a copy of the reprinted Canon in China for its own collection.

Very fortunately in 1946 Dr Kuo Yu-shou, head of the Education Section of UNESCO, was able to secure a copy from the Shih-shih Middle School, Chêngtu, and donate it to Cambridge. At this time Joseph Needham was in West China himself, where he was already discussing with Chinese scholars the importance of the Taoist tradition to the study of alchemy, and simultaneously busying himself on behalf of the University Library in the purchase of a wide range of Chinese materials. His contribution in this last role may be gauged from a letter from the Librarian to the Vice-Chancellor of 15th July 1946, which states 'In acknowledging the generosity of these benefactors whose gifts have so greatly enriched our Library I feel that I should also place on record our indebtedness to Dr Joseph Needham'. Although J.N. was not actually involved in securing a copy of the Taoist Canon for Cambridge, he was in charge of dispatching all materials for the Library from China, and he was certainly responsible for the purchase of a copy of the *Tao-tsang chi-yao*.

The advantages of having such a large body of Taoist literature readily available in Cambridge can be seen throughout *Science and Civilisation in China*. Even the first volume mentions the Taoist Canon as a source, whilst the bibliographies of Volume V,



Page from a work included in the *Tao-tsang*, which concerns charms and other devices with which to invoke beneficial spirits or to expel evil influences.

parts 2-5, list so many Taoist texts as to constitute valuable reference works in themselves. Joseph Needham's unusual familiarity with Taoist materials has been recognized worldwide: he was the only British scholar to attend all three International Conferences on Taoism, in Italy (1968), Japan (1972) and Switzerland (1979), and some of his own writings on Taoism were already translated into Chinese as early as 1963 - six years before anything written by Henri Maspero reached a Chinese audience.

Now the Needham Research Institute itself has become the recipient of a donated Taoist Canon, not in the unwieldy 1920s Shanghai edition, but in a compact, reduced-size reprinting produced by the Hsin-wên-fêng Company of Taipei in 1977. This gift, from the Tainan branch of the Taoist Association of the Republic of China, will ensure that future research into the Canon may now proceed smoothly at the Institute itself.

T. H. Barrett

## THE SOCIO-ECONOMICS OF SCIENCE

*Brief Report on a visit to Bogotá, Colombia, by Kenneth Robinson to attend a Conference on 'The Socio-economics of Science', organised by the Centro Internacional de Física of Latin America.*

The conference was held in Bogotá from 21st to 30th November 1987. It opened at the Centro Internacional de Física, and subsequent meetings were held in the National University. Those attending, either full or part time, totalled 32, 19 from Colombia and 13 from other countries. In addition to physics, the fields of specialisation which were represented included astronomy, biology, chemistry, earth sciences, history of science, mathematics, planning, socio-economics and technology. The following countries were represented: Brazil, Ecuador, Israel, Italy, Mexico, Puerto Rico, Salvador, Spain and the United Kingdom.

The idea behind the meeting was to try to establish a pattern for the development of science in Latin-American countries which would take into account the realities of the situation, but the purpose of the meeting was to engage in vigorous discussion. This expressed itself in a lively and democratic form of lecturing. Lecturers, no matter how distinguished, were liable to be stopped in mid-flow with questions or counter-statements, and if necessary a point was thrashed out in debate before the lecturer resumed. My own lecture was entitled 'Parallel developments in China and the West'. Great interest was shown both in the history of China and in its modern development, which was held to offer stimulating alternative programmes for developing countries. Joseph Needham's work was well known and appreciated, and interest was expressed in the role of the Needham Research Institute. What was appreciated most of all, however, was the extension of support to scientists in Latin America simply by sending a member of the Institute's staff to learn of their problems and to share ideas. It became clear as the discussions developed that scientists in Latin America feel very much isolated and starved of ideas, books and resources. They are very much aware that in all Latin American countries except Brazil scientists are so thin on the ground that

their views carry little weight with their governments, and that their governments seem not to be interested in spreading scientific attitudes throughout society, but perhaps the opposite. Again and again the need for political will in developing countries was emphasised, and its lack in Latin America was contrasted with its presence in Japan at the time of the Meiji Restoration. The levels of education and culture of the Latin American military were unfavourably contrasted with those of the Shōguns of Japan.

At the conclusion of the conference a document was drawn up and agreed, called the Acuerdo de Bogotá. This proposed joint action by scholars concerned with science and scientists practising in its various fields. An interdisciplinary group would be formed for the improvement of research. Possible courses of action included -

1. The organisation of biennial conferences similar to the one in progress.
2. Production without delay of a bulletin of information concerning publications in the various branches of science in the Spanish and Portuguese speaking world.
3. The carrying out of viability studies for the publication of an Ibero-American Review of Sciences, in which the following points would feature:
  - a) The present state of scientific research in the fields of particular disciplines, international no less than Ibero-American, by the publishing of review articles.
  - b) The socio-cultural conditions in which scientific work is developing in our countries.
 (Publication is to be in Spanish and Portuguese)
4. Promotion of case studies about the history and socio-economics of science in Ibero-America.
5. The establishing of a directory of social and natural scientists who are concerned with the development of science in Ibero-America, its object being to form a network of solidarity between Ibero-American scientists, which will help to mitigate the effects of instability suffered by our communities, and to increase their cohesion.
6. Feasibility studies to be made towards the establishing of centres in which large scientific projects may be realised as a result of co-operation between the Ibero-American nations.

There was general condemnation of the way in which the governments of Latin American states are anxious to install expensive nuclear reactors as status symbols, disregarding the fact that there is no use for the electricity so generated in countries below a certain level of development. Brazil was perhaps the exception. The attitude of the participants was in my opinion dedicated and courageous, which made it a pleasure to work with them. As one of the purposes of *Science and Civilisation in China* is, I believe, to provide a model for histories of science and technology of other civilisations, and as the Centro Internacional de Física is anxious to learn from China and the Needham Research Institute, I feel that any help given to them in future will not be misplaced.

Kenneth Robinson

## THE ENCYCLOPEDIA OF CHINESE HISTORY AND CULTURE

In 1986 the Istituto Universitario Orientale, Naples, initiated discussions and started to formulate plans for the preparation of an *Encyclopedia of Chinese History and Culture*. The work is envisaged as an international co-operative project which will draw on the intellectual resources of Europe, East Asia, North America and Australia. It will cover aspects of both traditional and modern China, and it is intended to act as a reference book that will meet the needs of members of the educated public, of those such as diplomats, journalists or businessmen who are engaged in public life in East Asia; historians, social scientists and others whose academic interests do not centre on East Asia; and specialist scholars of Chinese subjects themselves. The work will complement other major projects that are in process of completion, such as the *Cambridge History of China* and *Science and Civilisation in China*, and it will match other encyclopedias such as that of Japan (published by Kōdansha in 1983) and that of Islam (in process of completion).

Professor Lionello Lanciotti (Naples) is Chairman of the advisory board of the project, whose members include Joseph Needham, Nathan Sivin and Michael Loewe. The Encyclopedia will be published by E. J. Brill, Leiden; it is hoped that the first volume will appear by 1992 and that the work will be completed by 2000.

# SCIENCE AND CIVILISATION IN CHINA

published by Cambridge University Press

Extracts from some reviews of *Science and Civilisation in China Volume V Part 7: The Gunpowder Epic*: (published in 1987)

'No work of scholarship in the twentieth century has done as much to alter received ideas about the past as Joseph Needham's *Science and Civilisation in China*. ... *The Gunpowder Epic* is indeed an epic. Like some of its predecessors, it far transcends the limits implicit in the title by dealing also with Moslem and Christian uses of gunpowder, mainly for war but also in peace... Needham's talents are extraordinary - a combination of linguistic ability, chemical and technical competence, and a cast of mind that has put endless details together into a clear and convincing picture of a world-wide development that ran across some 1,500 years... This is a truly great and mind-enlarging book.' *Nature*

'Rightly, Needham subtitles his book "The Gunpowder Epic", for it is a study of epic proportions

by reason both of its theme and of the extraordinary range of evidence on which it is based both in space and time.' *New Scientist*

'... it is appropriately entitled *The Gunpowder Epic*, for in the hands of Needham and his collaborators the story unfolds with all the majesty of the great literary epics of the past... Publishers are not given to understatement, but no one could dispute Cambridge University Press's claim that Needham's original concept "has developed into the major scholarly work of our time". Many would add "or of any other time".' *The Times Higher Education Supplement*

'The production is, as always, handsome, and the illustrations, mainly from woodblock illustrations in Chinese books, particularly useful. This is one of the most indispensable of all the parts of *Science and Civilisation* published so far.' *Asian Affairs*



The southern silk-reeling frame (*nan-sao-che*), +1313. *NS* (+1530 ed.), ch. 22, pp. 26ab.

Titles published to date (1954-1988):

Volume I:	INTRODUCTORY ORIENTATIONS	£40.00 net
Volume II:	HISTORY OF SCIENTIFIC THOUGHT	£70.00 net
Volume III:	MATHEMATICS AND THE SCIENCES OF THE HEAVENS AND THE EARTH	£90.00 net
Volume IV:	PHYSICS AND PHYSICAL TECHNOLOGY	
Part 1:	Physics	£50.00 net
Part 2:	Mechanical Engineering	£80.00 net
Part 3:	Civil Engineering and Nautics	£90.00 net
Volume V:	CHEMISTRY AND CHEMICAL TECHNOLOGY	
Part 1:	Paper and Printing	£55.00 net
Part 2:	Spagyric Discovery and Invention: Magisteries of Gold and Immortality	£55.00 net
Part 3:	Spagyric Discovery and Invention: Historical survey from Cinnabar Elixirs to Synthetic Insulin	£45.00 net
Part 4:	Spagyric Discovery and Invention: Apparatus, Theories and Gifts	£80.00 net
Part 5:	Spagyric Discovery and Invention: Physiological Alchemy	£70.00 net
Part 7:	Military Technology; The Gunpowder Epic	£50.00 net
Part 9:	Textile Technology: Spinning and Reeling	£60.00 net
Forthcoming:	<i>Military Technology:</i>	
Part 6:	Missiles and Sieges	About £50.00
Volume VI:	BIOLOGY AND BIOLOGICAL TECHNOLOGY	
Part 1:	Botany	£55.00 net
Part 2:	Agriculture	£65.00 net

For further details of these please write to Lorna Williams at Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU.

The following titles will be published over the next ten years:

Volume V:	CHEMISTRY AND CHEMICAL TECHNOLOGY
Part 8:	<i>Military Technology:</i> Shock Weapons and Cavalry
Part 10:	<i>Textile Technology:</i> Weaving and Looms
Part 11:	<i>Non-ferrous metallurgy</i>
Part 12:	<i>Ferrous metallurgy and mining</i>
Part 13:	<i>Ceramic Technology</i>
Part 14:	<i>The Salt Industry, Ink, Lacquer Pigments, Dyes and Adhesives</i>
Volume VI:	BIOLOGY AND BIOLOGICAL TECHNOLOGY
Part 3:	<i>Agro-Industries:</i> Animal Husbandry, Fisheries, Agricultural Industries and Forestry
Part 4:	<i>Horticulture and Botanical Technology</i> (A continuation of the volume on botany already published.)
Part 5:	<i>Zoology</i>
Part 6:	<i>Nutritional Science and Fermentation Technology</i>
Parts 7 to 10:	<i>Institutes of Medicine</i> (Anatomy and Physiology), <i>Medicine, Pharmaceuticals</i>
Volume VII:	THE SOCIAL BACKGROUND
Part 1:	<i>Introductory Considerations</i>
Part 2:	<i>Economic Contexts</i>
Part 3:	<i>Language, Logic and Science</i>
Part 4:	<i>Political and Ideological Dimensions, General Conclusions</i>

It must be emphasised that the subject-matter of some of the parts given above is subject to alteration as research proceeds. Further information about these titles will be included in future editions of the *Needham Research Institute Newsletter*.

Edited by Michael Loewe and printed by University Printing Services of Cambridge University Press; please address all enquiries to the Editor c/o Needham Research Institute, 8 Sylvester Road, Cambridge CB3 9AF.