

# NEEDHAM RESEARCH INSTITUTE NEWSLETTER

Newsletter No. 7

EAST ASIAN HISTORY OF SCIENCE TRUST

January 1990



## MARRIAGE

The marriage arranged between Dr J. Needham, F.R.S., F.B.A. Hon. F.R.C.P. and Dr Lu Gwei-Djen took place in the chapel of the Hall of the Annunciation, now known as Gonville and Caius College, on 15 September 1989. Members of the Institute have been delighted to offer their congratulations to Dr and Mrs Needham, who have taken up residence at No. 2 Sylvester Road.

## BENEFACTION

The Institute acknowledges with deep thanks a generous gift made by Ahmed Ben Bella towards running expenses.

## VISITORS

The visitors whom the Institute has been glad to welcome recently have included Dr Viviane Alleton and Dr Karine Chemla (Paris); Ms Chang Hsiang-wen (National Palace Museum, Taipei); Dr W. H. Ferry and Mrs Carol Ferry (New York); Professor Montgomery Furth and Professor Charlotte Furth (California); Dr Hsü Chen-thao and Dr Lo Chao (Academia Sinica); Mr Al Huang (United States of America); Dr Huang Hsing-tung (National Science Foundation); Professor Itô Shuntarô; Dr Liu Ching-chih and Ms Hsieh Yun-chen (Hong Kong University); Mrs Edith P. Louissell (Chattanooga); Mr Iain Orr (HBM Consul-General, Shanghai); Dr and Mrs Ezechiel Saad (Paris); Professor Sung Young-gon (Seoul); Professor Marie Urquidi (Mexico); and a party from the Friends of the SACU Library.

## SOUTH WING

Thanks to the generous benefactions that have been received, as reported in previous numbers of the Newsletter, it was possible to start work on the South wing in



Ahmed Ben Bella and Ken Coates

November. It is expected that the building will be completed by early 1991.

## LIBRARY

The Librarian is glad to express her deep thanks to the following for books that they have given to the Library: Ms Chang Hsiang-wen; Dr Cheng Yu-hsin; Father Ching Yao-shan (SJ); Professor Sir Clifford Darby; Professor Jeon Sang-woon; Dr Georges Métaillé; Dr Ezechiel Saad; Dr Donald Wagner; and Dr Brian Wijeratne.

On the occasion of his move to no. 2 Sylvester Road, Dr Needham kindly arranged for large parts of his private collections to be given to the East Asian History of Science Library. The shelves are now enriched by works of classical literature, philosophy, eighteenth century European literature and by a number of volumes of science fiction. The Institute is grateful to the staff of the University Library for helping to move these books to their new home.

The computer link-up with the Cambridge University Data Network has now been completed.

The large number of bibliographical lists that had been made severally for each of the volumes of SCC have now been united.

## CONFERENCE ON 'THE HISTORICAL DYNAMICS OF ORIENTAL SOCIETIES'

The Inaugural Conference of the Needham Research Institute, marking the opening of the Institute's Central Block and East Wing, was held from 7 to 11 August 1989 in the premises of Robinson College, Cambridge. The participants and other guests were received in the Institute by its Director and Associate Director, and their co-workers, on the evening of the seventh.

The conference was sponsored jointly by the Institute and the Bertrand Russell Peace Foundation, and was made possible through the generosity of Ahmed Ben Bella, the Founding President of the Democratic and Popular Republic of Algeria.

Entitled 'The Historical Dynamics of Oriental Societies', this event brought together thirty-five scholars from a dozen countries around the world. It was designed to examine from a comparative point of view the social, economic and political features of ancient and mediaeval societies of Africa and Asia, in particular

Imperial China, and to pursue some of the fundamental historiographical issues that have occupied Joseph Needham and his collaborators in the 'Science and Civilisation in China' project.

The original suggestion for an international conference devoted to such questions came from the well known historian and political scientist Wu Ta-K'un (Wu Dakun) of the Chinese People's University (Zhongguo Renmin Daxue) in Beijing. This idea was passed to Dr Needham by Ken Coates of the Russell Foundation, and was eventually taken up as historical discussions in the People's Republic of China came to include again 'unorthodox' Marxist notions like the 'Asiatic mode of production', as well as to draw on recent trends in Western scholarship, and to generate new and original approaches to the analysis of Chinese history.

An important practical aim of the conference was consequently to provide a forum in which various theoretical positions could be aired, and in which scholars from a variety of national and disciplinary backgrounds could express their views on matters related to the comparative study of social history and historical sociology in premodern societies. My impression is that participants in the conference felt this aim was generally achieved and the diversity of points of view represented one of the event's chief attractions. Nevertheless, a number of significant contributors were in the end unable to attend the proceedings. These included Chinese participants who had planned to come from the People's Republic, as well as Maurice Godelier, Ferenc Tokëi and Peter Nolan, and Su Shaozhi who had advised on the planning of the conference. Papers submitted by such contributors were distributed and/or presented at the conference by other-participants. In the report that follows I shall concentrate on the written papers, because they provide the most direct access to the range of topics discussed.

The proceedings were opened on Monday afternoon by Dr Needham and Mr Coates. In welcoming the participants, Needham stated his hope that they would be able to throw light on the specific nature of traditional Chinese society, and on the social and economic conditions that made possible China's remarkable record of discovery and invention in approximately the first fifteen hundred years of the present era. Referring to the close relationship in the early modern West between the rise of the bourgeoisie and the emergence of modern science, he raised several further questions that had long occupied him, namely, Why was it that China had fallen behind the West in science, and had not developed distinctively modern science before it was introduced by Westerners? And which factors in Imperial China had served to inhibit capitalism from becoming the dominant system of economic and social organisation there? Dr Needham noted that in dealing with such questions reference was often made to notions of 'bureaucratic feudalism' and the 'Asiatic mode of production'. Ken Coates spoke of the great interest Chinese intellectuals had been showing in recent years for such ideas which served as touchstones in discussions throughout the conference.

Maurice Godelier's keynote paper was entitled 'The Asiatic mode of production: a stimulating but analytically inefficient concept'. In it he noted the concept's heuristic value historically as a means of avoiding narrow, reductionist interpretations of non-Western societies, but he argued that theoretically its diffuseness made it unsuitable for adequately grounding analyses of particular social formations. Gregory Blue spoke about debates in the 1920s and 1930s about the 'Asiatic' and feudal modes of production, in the context of the development of 'orthodox' Soviet Marxist historiography, and he suggested several levels at which the 'Asiatic' mode had been associated with anti-Stalinism. Lawrence Krader and Ferenc Tokëi affirmed the richness of Marx's concept of the Asiatic mode. Krader maintained that there was nothing essential linking it to despotism, and he also observed that Marx had erred in his formulations both by attributing stagnation to Asian societies and by arguing that they lacked cities. He argued against the concept of bureaucratic feudalism both on the grounds that bureaucracies were common to various social systems, and on the grounds that

feudalism in Marx's sense referred specifically to a system in which there were *glebae adscripti*, or serfs bound to the soil. Tokëi drew on György Lukács' late historiographical thought in defending Marx's formulations against critics of Orientalism, and he characterised 'Asiatic' forms of society as those in which self-sustaining village communities are continually reproduced as the basic units of society. Recent Chinese discussions of the 'Asiatic' mode as an analytical tool for throwing light on the internal workings of the state and society in traditional China were insightfully outlined by Timothy Brook, while Michael Barratt Brown took the ideas of Owen Lattimore as his starting point and examined the extent to which strong tendencies towards the centralisation in pre-modern Asian and North African States could be explained in the light of military considerations and geo-political pressures.

Martin Bernal, Basil Davidson and Liao Xuesheng treated other topics in comparative social history that had implications for historical theory and were relevant to the conference's central theme. Liao considered the various types of kinship relations found in antiquity in China, Athens and Rome, and he analysed the different paths of development of such relations with special reference to the evolution of political structures in each society. He placed emphasis on the institutionalisation of the rights of the community of citizens in Athens and Rome. Bernal focused on the ancient Mediterranean basin and Near East and criticised approaches that have isolated the evolution of Greek culture from broader developments in the region. He argued in particular that slave society originated in Phoenicia, where independent cities and private property had also first arisen, and he supported Max Weber's idea that the chief contrast in regard to the predominance of slavery in ancient societies was not between 'Asia' and 'Europe', but between mercantile coastal societies and their land-based contemporaries. With Professor Davidson's address, emphasis shifted to economic tendencies of the late mediaeval and early modern periods. Making use of numismatic evidence recently found in East Africa and dating from between the tenth and the fifteenth centuries, he depicted the emergence of a money economy, though not of a system of capitalist production.

His discussion of this tendency set the stage for Wednesday's

papers that dealt with the Chinese economy during the Ming and Qing dynasties. Helen Dunstan's detailed case study of government policy regarding grain distribution in the 1740s vividly illustrated the sophistication both of official economic thought and of commercial activity generally in the eighteenth century; it also suggested an implicit preference away from planned state intervention and in favour of market-mechanisms. Peter Nolan and Chen Qiguang in turn addressed the question of longer-term trends regarding economic and technological development. Dr Nolan argued that after the Song dynasty the Chinese economy was marked by an ability to expand enormously without creating pressures sufficient to stimulate technical and scientific change. While mercantile capital was highly developed, the relative weakness of such effective pressures was conditioned by factors including the intensive nature of Chinese agriculture, the comparative non-involvement of merchants in handicraft production processes and the highly developed nature of commercial networks. In a similar vein, Chen Qiguang, giving a synthesis of recent work by Chinese economic historians, considered why Chinese levels of technology and science fell behind those of the West. He indicated that a growing population of self-sufficient peasant producers able to meet demand for both agricultural produce and handicrafts meant that the dominant economic tendency was for improvements in the organisation of labour and in skills, and not in tools in instruments of production. In this regard, both Nolan and Chen Qiguang alluded to Li Bozheng's observation that the scarcity of ferrous metals may have inhibited the development of engineering skills in this period.

Attention on the final day of the conference turned first to the sphere of politics and culture. Anouar Abdel-Malek argued that the high esteem for learning in China, far from making her exceptional, provided an example of the typical state of affairs in the major civilisations in Asia and Africa. Illustrating his argument by referring to the ideas of the tenth-century philosopher al-Farabi, he maintained that throughout the Orient legitimation was conferred primarily (though never exclusively) on the basis of philosophical and/or religious distinction, and he spoke of the integration of social power and cultural values, rather than their opposition, as the defining char-

acteristic of such societies. The rejection of the idea of 'Oriental despotism' at the heart of this position was implicit too in Timothy Brook's treatment of 'The mediated character of the Imperial State: implications for social theory'. By analysing the autonomy of local elites from the central State as essential to the political constitution of the Chinese empire, Brook illustrated the difficulties of interpreting Chinese society in terms of Marxist and/or Weberian categories, and he maintained that what is necessary is the revision of Western social and political theories in the light of new analyses of non-Western societies. Witold Rodzinsky argued similarly, maintaining, as other participants had, that discussion of Chinese history in terms of the five necessary stages of orthodox Marxism was a most unhelpful imposition.

Thursday afternoon saw two collaborators of the 'Science and Civilisation in China' project presenting analyses based on their recent work. In his treatment of Chinese mining, Peter Golas returned to the subject of the relation between economic conditions and technical change. He pointed out that, after agriculture, mining was probably the most important productive activity in traditional China. The preference of those engaged in it was not so much for exhaustive extraction, but for the extraction of available ores with minimum capital expenditure. The rationality of this lay in considerations of profitability and of working conditions, but it militated against pressures for mechanisation at the pit-face. However, the high price and thus relative scarcity of metals in traditional China was due more to the high costs of transportation, than to those of production.

Francesca Bray's paper focused on scientific thought. Contrasting Chinese and Western approaches to the classification of plants, she observed that traditional Chinese thinkers remained content with a diversity of systems of classification and, unlike their Western counterparts, were not moved by the desire to find a single, ideal system; and, while Western botany eventually tended towards classification by physical characteristics rather than by human uses of plants, the Chinese tradition showed no such tendency, but allowed the two types to co-exist.

Finally, Abdul Rahman elicited some broad philosophical issues raised by the conference by sketching two distinct paradigms of development: one Asian in ori-

gin, centred on the perfection of the human individual; the another stemming from post-Renaissance Europe, and concentrating on perfecting the use of materials to meet human needs. Implementation of the positive values inherent in the first (as articulated for example in traditional India and Islam) was inhibited by traditional hierarchies and class contradictions, whereas the rise of the second, through various forms of economic modernisation as well as the progress of modern science, has entailed a blindness to human values and ecological disaster. Rahman suggested that a solution to the problems deriving from each might lie in integrating the two approaches within a common value-system and rationality, and he examined Mohatma Gandhi's ideas as an attempt in this direction.

The various papers gave rise to lively discussions during the course of the conference, and notable interventions were made by Ahmed Ben Bella, Stephan Feuchtwang, Catherine Jami, Kenneth Robinson, Vella Pillay, Donald Wagner, Wang Ling and Chris Wickham, as well as by the speakers mentioned above. Some of the results of such discussions are to be incorporated into the planned volume of conference proceedings.

In his closing remarks Joseph Needham expressed his gratitude to all those who had participated in the conference. On behalf of the Needham Research Institute he expressed special thanks to President Ben Bella, and to Mr Ken Coates and the Bertrand Russell Peace Foundation.

Gregory Blue

## HORSES AND THEIR QUALITIES

In her introductory remarks to the history of agriculture, Francesca Bray referred briefly to the treatises written on the methods of assessing the qualities of horses (SCG vol. 6, Part II, p. 75). Recent Chinese publications make it possible to add the following remarks by way of comment.

Horses were highly prized animals in early imperial times. Difficult to rear and expensive to maintain, they served the needs of officials proceeding on their duties and of express couriers carrying urgent despatches along the lines of the armed forces. Han armies needed a supply of fine horses, and the hope of acquiring choice breeds lay behind some aspects of Han's foreign relations with the states of Central Asia. Six principal breeding stables, with 36 subordinate sites, were set up under the auspices of the government of Former Han; according to one source they were charged with the task of maintaining 300,000 mounts for the service.

Speed and endurance were the qualities most highly prized, and the conventional description of the finest of all horses was their ability to cover 100 *li* in a day. Appreciation of these qualities is manifest in some of the names said to have been given to some of the specially fine animals in the stables of the First Ch'in emperor (reigned 221 to 210 BC) or Han Wen ti (reigned 180 to 157 BC), e.g., 'Flying wing', 'Wind chaser' or 'Swallow in flight'.

The earliest manuals designed to assist the judgement of horseflesh (*hsiang ma ching*) survive in no more than fragmentary form. One of these was ascribed to the hand of Po Lo, the mythical hero seen as a past master in breeding, training and riding horses. A short text is ascribed to Ma Yüan (died c. AD 50), a Han general who took an active part in the restoration of the Han dynasty in 25, and whom we shall meet again shortly. But the most complete example of early writings on the subject forms a section of the *Ch'i min yao shu*, the compendium of agricultural techniques of the 6th century. All these documents identify the physical features whereby a horse's quality may be judged, be it by the teeth, colour inside the mouth, shape and posture of the lips, teeth, hooves, spine, limbs or tail.

Included among the manuscripts found in tomb no. 3 Mawang-tui, which dates from c. 168 BC, was a silk roll bearing 77 columns of script, that amounted to over 5000 characters. Possibly this was part of a text (known by title but now lost) that dealt with the appraisal of various types of animal; the surviving piece, which concerns horses, is considerably longer than any of the other early texts on the subject, but the treatment is much the same as in those documents. The manuscript pays particular attention to the eyes and limbs of the

animal, and refers to some topics that the relevant part of the *Ch'i min yao shu* (some 3000 characters long) does not mention. The manuscript calls on Yin Yang theory to explain some of the connections between the physical features of the horse and the animal's qualities and powers.

Model horses of terra-cotta have been seen in profusion, perhaps most notably at the tomb of the First Ch'in emperor; a similar example of an array of infantry and cavalry, on a much smaller scale, was found in a nearby tomb identified as that of Chou Ya-fu, Chancellor of the Han empire 150-147 BC. Such figures were doubtless made to symbolise the military might that the occupant of the tomb could command, or the extent of the protection that was his due; but somewhat different motives may have lain behind the production of certain other unique, and rather choice, examples to which the historical records refer, and of one famous example that has been discovered relatively recently. It has been tentatively suggested that such models were made as examples of horses of the finest quality and served as a yard-stick whereby live animals could be judged. In addition there may be some evidence to suggest that, before bronze models were used for this purpose, paintings or even ceramic figurines served in their place.

Two references to such models concern the Former Han period (202 BC to AD 9). First, in the time of Han Wu ti (reigned 141 to 87) a specialist in horses named Tung-men Ching presented one or more bronze horses to the throne. Being deeply appreciated it, or they, were set up in a prominent place at one of the gates of the palace, in Ch'ang-an city. The gate was then renamed the 'Chin ma men' (Gate of the horses of metal), and was used as a place of assembly for newly appointed officials awaiting their commissions. Secondly, in the course of attempts to acquire horses of the best breeds from Central Asia, c. 100 BC, Han envoys took with them a supply of money and at least one model horse, probably of bronze. As no deal was forthcoming, rather than leave the model, or models, behind them, the envoys smashed them to pieces with hammers. Their motives for doing so are unstated and they may have been varied; if speculation is permitted, it may have been that, angered at the refusal of the horse-breeders of the steppe to cooperate, they wished to deny them knowledge of the precise

points that Han horse dealers would be looking for, as they stood round the ring and made their bids.

Some century or more later Ma Yüan re-appears. In the course of campaigns in the deep south, AD 42-43, he had acquired one or more of the locally made bronze drums, doubtless of Dong-son style. He had these vessels melted down, and used the metal to cast a model horse that stood 80 cm in height. Anxious to retain his favoured position at court, he in his turn presented the model to his emperor, who had it set up at the entrance of one of the audience halls at his capital, of Lo-yang. The term whereby the object was denoted *ma shih* is of considerable interest.

These models are no longer available for inspection, and it is possible that they were melted down to do duty as coin. However, we are fortunate enough now to possess the famous 'Flying swallow' horse that was excavated in 1969 at a tomb near Lei-t'ai (Kansu province), that is dated c. AD 200. This model (34 cm high; 45 cm long) is well known enough, and a large scale replica now stands in one of the main streets of Lan-chou. The animal is fashioned moving at high speed, with three legs in active motion and the fourth, on which the whole piece is balanced, planted on the swallow, (identified by some as a crow) whose speed it has been surpassing. The horse is not to be identified with any particular breed; and it is claimed that in at least 25 respects its features manifest precisely some of the points that the *Ch'i min yao shu* and other documents specify as the marks of an animal of first quality; e.g., the inner part of the mouth (i.e. the oral mucous membrane) was painted red; the upper lip is taut; the lower lip is relaxed; the knees are squared off.

Since its discovery the bronze horse from Lei-t'ai has drawn praise and admiration as a work of art. It need be no detraction from its artistic merits to suggest that, like the models smashed in 100 BC or those presented to the throne, this one may have been made as an example of the perfect horse—the Platonic form of a horse, against which a living animal could be judged and its qualities assessed.

References: *Kaogu yu wen wu* 1982.2, 81-87; *Wen wu* 1977.8, 17-22 and 23-26; *Wen wu* 1989.6, 75-83.

M.L.

# THE CAMBRIDGE HISTORY OF CHINA

General Editors:

JOHN K. FAIRBANK

*Francis Lee Higginson Professor of History, Emeritus, Harvard University*

DENIS TWITCHETT

*Gordon Wu Professor of Chinese Studies, Princeton University*

Planned in 16 volumes, *The Cambridge History of China* aims to provide a substantial account of the history of China as a benchmark for an international readership. The out-pouring of current research, the application of new

methods and the extension of scholarship into new fields, have all stimulated Chinese historical studies and are reflected in the formulation and editing of the *History*.

'With this series, Cambridge University Press embarks upon a great service to general education and humane letters.'

*The Observer*

'...should prove to be a valuable aid to the scholar and a unique introduction for general readers.'

*Asian Affairs*

## Already published

Volume 1:	The Ch'in and Han Empires 221 BC - AD 220 Edited by DENIS TWITCHETT and MICHAEL LOEWE 1987 0 521 24327 0	£70.00 net
Volume 3:	Sui and T'ang China, 589-906, Part I Edited by DENIS TWITCHETT 1979 0 521 21446 7	£75.00 net
Volume 7:	The Ming Dynasty 1368-1644, Part I Edited by FREDERICK W. MOTE and DENIS TWITCHETT 1988 0 521 24332 7	£65.00 net
Volume 10:	Late Ch'ing 1800-1911, Part I Edited by JOHN K. FAIRBANK 1978 0 521 21447 5	£70.00 net
Volume 11:	Late Ch'ing 1800-1911, Part II Edited by JOHN K. FAIRBANK and KWANG-CHING LIU 1980 0 521 22029 7	£70.00 net
Volume 12:	Republican China 1912-1949, Part I Edited by JOHN K. FAIRBANK 1983 0 521 23541 3	£80.00 net
Volume 13:	Republican China 1912-1949, Part II Edited by JOHN K. FAIRBANK and ALBERT FEUERWERKER 1976 0 521 24338 6	£80.00 net
Volume 14:	The People's Republic, Part I Edited by RODERICK MacFARQUHAR and JOHN K. FAIRBANK 1987 0 521 24336 X	£60.00 net

## To be published in 1991

Volume 15:	The People's Republic, Part II Edited by RODERICK MacFARQUHAR and JOHN K. FAIRBANK	
Volume 6:	Alien Regimes and Border States Edited by DENIS TWITCHETT and HERBERT FRANKE	

## Volumes in preparation

Volume 8:	The Ming Dynasty, Part II Edited by FREDERICK W. MOTE and DENIS TWITCHETT	
Volume 2:	The Period of Disunion Edited by DENIS TWITCHETT	
Volume 4:	Sui and T'ang China, Part II Edited by DENIS TWITCHETT	
Volume 5:	Five Dynasties and Sung Edited by DENIS TWITCHETT	

## Further planned volumes

Volume 9a:	The Ch'ing Empire Editor to be appointed	
Volume 9b:	Ch'ing Economy, Society and Civilisation Editor to be appointed	

## SCIENCE AND CIVILISATION IN CHINA

Titles published to date (1954-1989):

Volume I:	INTRODUCTORY ORIENTATIONS	£45.00 net
Volume II:	HISTORY OF SCIENTIFIC THOUGHT	£85.00 net
Volume III:	MATHEMATICS AND THE SCIENCES OF THE HEAVENS AND THE EARTH	£100.00 net
Volume IV:	PHYSICS AND PHYSICAL TECHNOLOGY	
Part 1:	Physics	£60.00 net
Part 2:	Mechanical Engineering	£95.00 net
Part 3:	Civil Engineering and Nautics	£105.00 net
Volume V:	CHEMISTRY AND CHEMICAL TECHNOLOGY	
Part 1:	Paper and Printing	£65.00 net
Part 2:	Spagyric Discovery and Intervention: Magisteries of Gold and Immortality	£65.00 net
Part 3:	Spagyric Discovery and Invention: Historical survey from Cinnabar Elixirs to Synthetic Insulin	£65.00 net
Part 4:	Spagyric Discovery and Invention: Apparatus, Theories and Gifts	£90.00 net
Part 5:	Spagyric Discovery and Invention: Physiological Alchemy	£75.00 net
Part 7:	Military Technology: The Gunpowder Epic	£70.00 net
Part 9:	Textile Technology: Spinning and Reeling	£70.00 net
Forthcoming:	<i>Military Technology:</i>	
Part 6:	Missiles and Sieges	About £75.00
Volume VI:	BIOLOGY AND BIOLOGICAL TECHNOLOGY	
Part 1:	Botany	£75.00 net
Part 2:	Agriculture	£75.00 net

For further details of these please write to Humanities Publicity, 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, Pharmaceutics</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 Service of Cambridge University Press; please address all enquiries to the Editor c/o Needham Research Institute, 8 Sylvester Road, Cambridge CB3 9AF.