SCIENCE AND CIVILISATION IN CHINA

The subject of discourse, briefly put, is the free travel and inward and outward movement of the divine *ch'i*; it is not skin, flesh, sinews and bones.

HUANG TI NEI CHING, LING SHU
First century BC

Chinese medicine heals in a world of unceasing transformation. This condition of constant change, this fluidity of material forms, stands in sharp contrast to a (modern Western) commonsense world of discrete entities characterized by fixed essences, which seem to be exhaustively describable in structural terms . . . In the early Chinese sciences, by contrast, where generation and transformation are intrinsic to existence, fixity and stasis occur only as a result of concerted action and therefore demand explanation; motion and change are a given and seldom need be explained with reference to their causes. One consequence of this dynamic bias in Chinese medicine is that the body and its organs (i.e., anatomical structure) appear as merely contingent effects or by-products of physiological processes.

JUDITH FARQUHAR
1994

THE PICTURE OF THE TAOIST GENII PRINTED ON THE COVER of this book is part of a painted temple scroll, recent but traditional, given to Mr Brian Harland in Szechuan province (1946). Concerning these four divinities, of respectable rank in the Taoist bureaucracy, the following particulars have been handed down. The title of the first of the four signifies 'Heavenly Prince', that of the other three 'Mysterious Commander'.

At the top, on the left, is Liu *Thien Chün*, Comptroller-General of Crops and Weather. Before his deification (so it was said) he was a rain-making magician and weather forecaster named Liu Chün, born in the Chin dynasty about +340. Among his attributes may be seen the sun and moon, and a measuring-rod or carpenter's square. The two great luminaries imply the making of the calendar, so important for a primarily agricultural society, the efforts, ever renewed, to reconcile celestial periodicities. The carpenter's square is no ordinary tool, but the gnomon for measuring the lengths of the sun's solstitial shadows. The Comptroller-General also carries a bell because in ancient and mediaeval times there was thought to be a close connection between calendrical calculations and the arithmetical acoustics of bells and pitch-pipes.

At the top, on the right, is Wên *Yuan Shuai*, Intendant of the Spiritual Officials of the Sacred Mountain, Thai Shan. He was taken to be an incarnation of one of the Hour-Presidents (*Chia Shen*), i.e., tutelary deities of the twelve cyclical characters (see Vol. 4, pt 2, p. 440). During his earthly pilgrimage his name was Huan Tzu-Yü and he was a scholar and astronomer in the Later Han (b. +142). He is seen holding an armillary ring.

Below, on the left, is Kou *Yuan Shuai*, Assistant Secretary of State in the Ministry of Thunder. He is therefore a late emanation of a very ancient god, Lei Kung. Before he became deified he was Hsin Hsing, a poor woodcutter, but no doubt an incarnation of the spirit of the constellation Kou-Chhen (the Angular Arranger), part of the group of stars which we know as Ursa Minor. He is equipped with hammer and chisel.

Below, on the right, is Pi *Yuan Shuai*, Commander of the Lightning, with his flashing sword, a deity with distinct alchemical and cosmological interests. According to tradition, in his early life he was a countryman whose name was Thien Hua. Together with the colleague on his right, he controlled the Spirits of the Five Directions.

Such is the legendary folklore of common men canonised by popular acclamation. An interesting scroll, of no great artistic merit, destined to decorate a temple wall, to be looked upon by humble people, it symbolises something which this book has to say. Chinese art and literature have been so profuse, Chinese mythological imagery so fertile, that the West has often missed other aspects, perhaps more important, of Chinese civilisation. Here the graduated scale of Liu Chün, at first sight unexpected in this setting, reminds us of the ever-present theme of quantitative measurement in Chinese culture; there were rain-gauges already in the Sung (+12th century) and sliding calipers in the Han (+1st). The armillary ring of Huan Tzu-Yü bears witness that Naburiannu and Hipparchus, al-Naqqash and Tycho, had worthy counterparts in China. The tools of Hsin Hsing symbolise that great empirical tradition which informed the work of Chinese artisans and technicians all through the ages.

SCIENCE AND CIVILISATION IN CHINA

Joseph Needham
(1900–1995)

> 'Certain it is that no people or group of peoples has had a monopoly in contributing to the development of Science. Their achievements should be mutually recognised and freely celebrated with the joined hands of universal brotherhood.'
>
> *Science and Civilisation in China* VOLUME 1, PREFACE.

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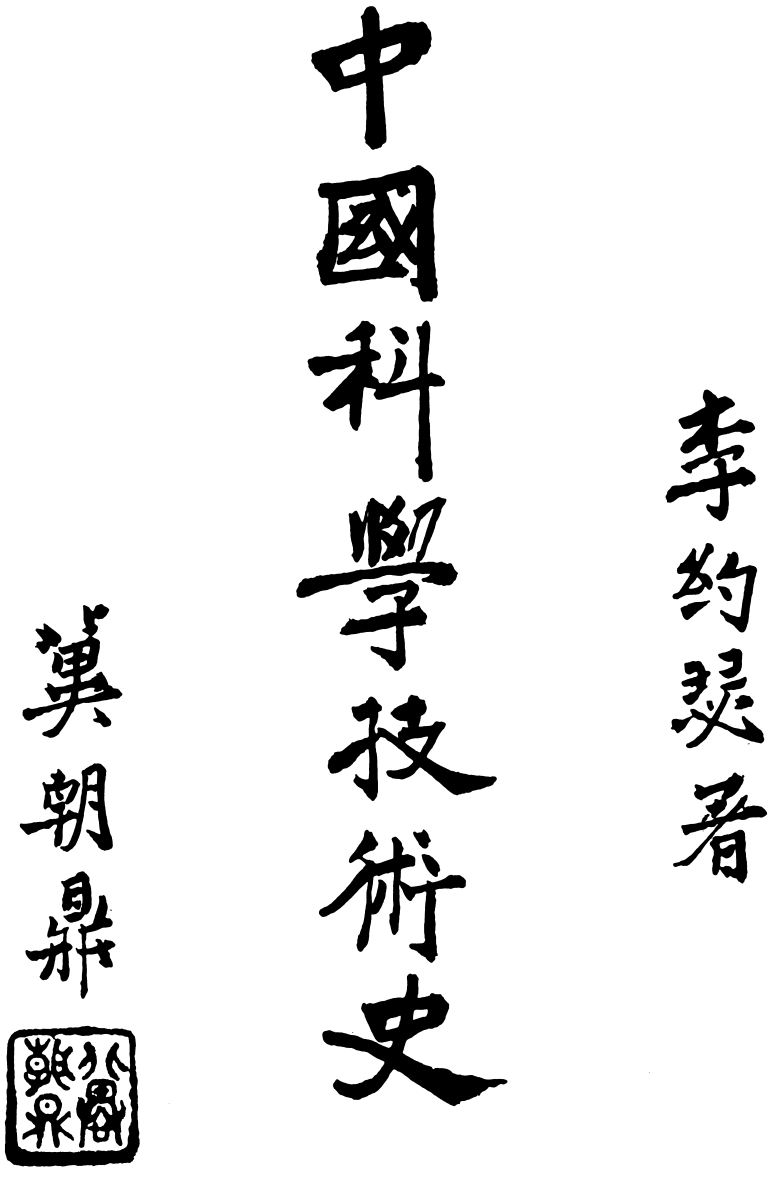
Joseph Needham directly supervised the publication of seventeen books in the *Science and Civilisation in China* series, from the first volume, which appeared in 1954, through to Volume 6.3, which was in press at the time of his death in March 1995.

The planning and preparation of further volumes will continue. Responsibility for the commissioning and approval of work for publication in the series is now taken by the Publications Board of the Needham Research Institute in Cambridge, under the chairmanship of Dr Christopher Cullen, who acts as general editor of the series.



SCIENCE AND CIVILISATION IN CHINA

VOLUME 6

BIOLOGY AND BIOLOGICAL TECHNOLOGY

PART VI: MEDICINE

BY

JOSEPH NEEDHAM

with the collaboration of

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edited and with an introduction by

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To the memory of

LU GWEI-DJEN
Fellow of Robinson College, Cambridge

DOROTHY NEEDHAM
Founding Fellow of Lucy Cavendish College, Cambridge

JOSEPH NEEDHAM
Sometime Master of Gonville and Caius College, Cambridge

and splendid days in many parts of the world shared in a quest for understanding

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SERIES EDITOR'S PREFACE

When Joseph Needham laid out the plan for the Science and Civilisation in China project half a century ago, he envisaged it as consisting of seven volumes. For the sake of readers familiar with the multi-part volumes of SCC as it is today, I must explain that each volume was originally supposed to be a single book. Contained within the seven-volume structure was a finer division of subjects into fifty sections. Sections 43 to 45 broadly covered the topics of medicine in China.

The first three volumes showed the steady tendency to growth, which was the result of Needham's immense energies of assimilation and synthesis. Volume 3 was of a size which in itself would have constituted a life's work for many less ambitious scholars. At this point considerations of what we may very appropriately call binding energy dictated that the nucleons of knowledge should be reformed into smaller and more stable units. Every volume from number 4 onwards has been split into physically separate parts, which in some cases amount to more than a dozen substantial books.

The problem was, as Needham himself was the first to point out, that an ever-lengthening SCC would eventually outstretch the span of normal human energies or even life itself. Needham's response to this was (as one might have expected) heroic. Although responsibility for some parts of the plan was passed to collaborators, he made no compromise with the length or depth of treatment that seemed appropriate for those topics on which he worked himself. His routine of daily labour continued through his eighties into his nineties, and it was only with difficulty that he was persuaded to stay at home for a rest the day before he died on 24 March 1995.

One of the principal tasks that occupied him during his final years was the mass of research and writing on medicine by himself and Lu Gwei-djen, his lifetime collaborator (1904–1991). Both of them had worked on this topic from the very beginnings of their cooperation on the SCC project. Some of their results had appeared in draft versions as journal articles or contributions to conference proceedings, and one portion had been published as a major book on acupuncture and moxibustion – *Celestial Lancets* (1980). But much remained to be done, since a large part of what had been written was in need of updating, and some of it required substantial expansion and rewriting.

At the age of ninety Joseph Needham retired as Director of the Needham Research Institute, and was succeeded by Professor Ho Peng-Yoke, who had been one of his long-term collaborators. For Professor Ho, this meant lengthy periods of exile from his home and family in Australia. In the following year I was asked by Joseph Needham to join the team working under Professor Ho by acting as Chairman of the Needham Research Institute Publications Board. One of the first issues to be dealt with was how the Board might help to ensure that Needham's work on medicine was speedily brought to press. As Joseph Needham himself was well aware, this was not likely to be a simple task.

It was already clear that the labours of updating and editing were becoming an insupportable burden for the author alone. But it was not easy to find a suitable helper. Much more than a research assistant or amanuensis was required – the job was one which could be done only by a senior scholar who could combine a sympathetic understanding of Needham and Lu's *oeuvre* with a deep and wide knowledge of the field. Moreover, such a scholar would have to be prepared to give up much of his own time to bringing to publication the work of another. So it was only after much deliberation within the NRI that Joseph Needham wrote to Professor Nathan Sivin in April 1993, making an appeal in the words of the young man in Saint Paul's dream 'Come over into Macedonia and help us.'

Nathan Sivin's response was rapid and generous. It was soon agreed that he should take on the job of editing the Needham and Lu material for publication, and of providing the book with an introduction reviewing the state of the field. And so the work began. Over the next two years there was repeated and close consultation between editor and author on many points, often through the medium of letters in giant print as Needham's eyesight began to fail. It is never an easy task to finish another scholar's work, but Professor Sivin did just that in a way that carefully preserved the spirit and substance of the writing of both authors while maintaining his own exacting standards to the full. In his introduction he has fully explained the approach he took to this task, and I shall not repeat his description here. It is enough to say that the result stands as a monument of broad enquiry, deep understanding of Chinese culture, and exact scholarship.

Finally thanks are due to those others who have helped this volume along its path to publication. First must be the two scholars who gave freely of their advice when asked to review the original material before the invitation was issued to Professor Sivin. These were Professor Francesca Bray and Professor Judith Farquhar. Also Professor Ma Boying went through the entire text during a visit to Cambridge and contributed many valuable suggestions.

Throughout the lifetime of this project many bodies have contributed funding to support the work of Needham and his collaborators. Most specifically, the Chiang Ching-kuo Foundation for Scholarly Exchange gave generous funding, which enabled Joseph Needham to have the essential services of a research assistant during the period when he was working on this book. Three holders of this post must be mentioned, Miss Jovanna Muir, Miss Corinne Richeux and Mrs Tracey Humphries (*née* Sinclair). Their contribution to the completion of this giant task took place behind the scenes, but it is one which Joseph Needham himself would certainly have acknowledged with gratitude had he lived to write a preface to this book. So I will do so in his place.

Dr Christopher Cullen