THE AMBITIONS OF CURIOSITY

Understanding the World in Ancient Greece and China

This book explores the origins and growth of systematic inquiry in Greece, China and Mesopotamia. Professor Lloyd examines which factors stimulated or inhibited this development, and whose interests were served. Who set the agenda? What was the role of the state in sponsoring, supporting or blocking research in areas such as historiography, natural philosophy, medical research, astronomy, technology, pure and applied mathematics and the rise of technical terminology in all those fields? How was each of those fields defined and developed in different ancient societies? How did truly innovative thinkers persuade their own contemporaries to accept their work? Three of the main themes elaborated are, first, the different routes those developments took in China, Greece and Mesopotamia; second, the unexpected result of many research efforts; and third, the tensions between state control and individual innovation, and the different ways they were resolved – problems that remain in scientific research today.

G. E. R. LLOYD is Emeritus Professor of Ancient Historian and Science at the University of Cambridge, where he was also Master of Darwin College from 1989 to 2000. His previous books include *Adversaries and Authorities* (1996) and *Methods and Problems in Greek Science* (1991).

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Preface

In the Michaelmas Term 2000 I had the honour to be invited to give the Isaiah Berlin lectures at Oxford. This was an assignment that any historian of ideas would find daunting, for all who met Berlin were in awe of the range of his learning, the sharpness of his wit, the elegance and panache of his writing. The experience of giving the lectures celebrating his memory was both intimidating and exhilarating. My very mixed audience was attentive and offered many perceptive comments, though I was a little taken aback, given Berlin's own famous quick-fire delivery, to be asked to speak more slowly.

This book is an expanded version of those lectures and remains close to their original plan. The unifying theme is provided not so much by a concept as by a problem, the growth of systematic inquiry. It obviously will not do to assume that every society has always valued research as in itself a good thing. So just how it gets to be initiated, in what subject areas, by whom, and why, with what aims and ambitions, pose important, if very general, issues that few scholars have had the courage or foolhardiness to broach. What did the investigators hope to find? Did they know what they were looking for? One of the themes of these studies is the openendedness of research and indeed its risky nature. The question this raises is how, when the results of inquiry challenged deep-seated convictions, they came nevertheless to be accepted, or at least not rejected out of hand, by those in authority – and others – in the societies in question. What indeed is the role of the state or other institutional authorities in sponsoring, sustaining or blocking research?

These are problems that remain directly relevant to the modern world. But to study the very beginnings of systematic inquiry we need to go back to antiquity, where indeed we can investigate them in a wide range of fields, not just in what corresponds to philosophy and science, but also in history, technology, language. Greece, China, Mesopotamia, Egypt,

India, all provide opportunities for our investigation, but I concentrate here mainly on the first two of these, a choice that reflects my own competence as much as it does the need to impose some limits on the scope of the discussion. Even so, with such a broad canvas, it is clearly impractical to attempt to cover more than a very small proportion of the ideas and data that can be brought to bear to illustrate the issues. So my aim is not to be comprehensive, but rather to propose arguments, leaving their further elaboration, documentation and testing for other occasions.

To present those arguments as crisply as possible, I have retained something of the style and format of the lectures. While I draw on materials from many different cultures and periods, I endeavour to provide, throughout, the basic information to be intelligible to the non-specialist. The ambitiousness of the project is apparent: in that respect it vies with the ambitions of those I make the object of my study. I am aware of the corresponding danger of seeming merely superficial. That is, however, an inescapable risk in any bid to open up new lines of comparative inquiry on topics of such general significance.

It is a pleasure to acknowledge the help I have received from many scholars who have given me the benefit of their views both on detailed points and on the overall strategy of my arguments. I would have made far more mistakes in my discussion of Mesopotamian astronomy but for the guidance of Francesca Rochberg and David Brown, not that they can be held responsible for how I have used their advice. My studies in Chinese science have everywhere benefited from my close collaboration with Nathan Sivin. We were putting the final touches to our joint work, *The Way and the Word*, as I was writing up these lectures, and its availability now allows me to refer to its more detailed discussion on many particular points. My Hellenist colleagues who have helped me are too numerous to mention, but among those who gave exceptionally useful criticisms and comments were, from my Oxford audience, Myles Burnyeat, David Charles, Sally Humphreys, Oswyn Murray. To these should be added others who gave generously of their advice on other occasions when I have presented one or more of these lectures, or material from them, at other universities, over the last two years, especially at Princeton, Madrid, Chicago and Beijing. I should like to express my thanks, both for their hospitality and for their constructive comments, to Willard Peterson, to Luis Vega, to Ian and Janel Mueller, to Liu Dun and to all their colleagues.

Finally it remains to record a special debt of gratitude to my hosts at Oxford, to the Committee in charge of the Berlin lectures for inviting me in the first place, to the Acting President of Corpus Christi College, Dr Christopher Taylor, and to all the Fellows of that College, for welcoming myself and my wife so warmly, and to Lady Berlin and to all those who made our stay such an enjoyable one.

Notes on editions

CHINESE

With some exceptions to be mentioned, ancient Chinese texts are cited according to standard editions, for example those of the Harvard-Yenching Institute series (HY) or the University of Hong Kong Institute of Chinese Studies series (ICS).

Chunqiu fanlu (春秋繁露) in the edition of Lai Yanyuan, Taibei, 1984.
Daodejing (道德經) in the ICS edition (Philosophical Works 24) 1996.
Erya (爾雅) in the ICS edition (Classical Works 16) 1995.
Guanzi (管子) in the Zhao Yongxian edition, reprinted in the *Sibu beiyao* series, Shanghai, 1936.
Hanfeizi (韓非子) in the edition of Chen Qiyou, Shanghai, 1958.
Hanshu (漢書) in the edition of Yan Shigu, *Zhonghua shuju*, Beijing, 1962, cited by *juan*, page and where necessary column number.
Hou Hanshu (後漢書) in the *Zhonghua shuju* edition, Beijing, 1965.
Huainanzi (淮南子) in the edition of Liu Wendian, Shanghai, 1923.
Huangdi neijing (黃帝內經). The *lingshu* (靈樞) and *suwen* (素問) recensions according to the edition of Ren Yingqiu, Beijing, 1986.
Jiuzhang suanshu (九章算書) in the edition of Qian Baocong, *suanjing shishu*, Beijing, 1963, cited by page number.
Liji (禮記) in the ICS edition (1992).
Lüshi chunqiu (呂氏春秋) in the edition of Chen Qiyou, Shanghai, 1984, cited by *juan* and *pian* number, followed by the page where necessary.
Lunheng (論衡) in the edition of Liu Pansui, Beijing, 1957.
Lunyu (論語) in the ICS edition (Classical Works 14) 1995.
Mengzi (Mencius) (孟子) in the HY series, Supplement 17, Beijing, 1941.
Mozi (墨子) in the edition of Zhang Chunyi, 1931.
Shiji (史記) in the *Zhonghua shuju* edition, Beijing, 1959, cited by *juan*, page and where necessary column number.

Shijing (詩經) in the ICS edition (Classical Works 10) 1995.
Sun Bin (孫臏) in the edition and translation in Lau and Ames (*Sun Pin: The Art of Warfare*) New York, 1996.
Sunzi (孫子) in the edition and translation in Ames (*Sun -tzu: The Art of Warfare*) New York, 1993.
Xunzi (荀子) in the HY series, Supplement 22, Beijing, 1950, cited by *pian* and line number.
Yantielun (鹽鐵論) in the ICS edition (Philosophical Works 14) 1994.
Yijing (易經) in the ICS edition (Classical Works 8) 1995.
Zhoubi suanjing (周髀算經) in the edition of Qian Baocong, *Suanjing shishu*, Beijing, 1963, cited by page number.
Zhouli (周禮) in the ICS edition (Classical Works 4) 1993.
Zhuangzi (莊子) in the HY series, Supplement 20, Beijing, 1947.
Zuozhuan (左傳) in the edition by Yang Bojun, 4 vols., Beijing, 1981, cited by Duke, year and where necessary page number.

GREEK AND LATIN

I cite the major Greek and Latin authors by standard editions, for example, the fragments of the Presocratic philosophers according to the edition of H. Diels, revised by W. Kranz, *Die Fragmente der Vorsokratiker*, 6th edn, Berlin, 1952, the works of Plato according to Burnet's Oxford text, the treatises of Aristotle according to Bekker's Berlin edition. The works of Euclid are cited by the edition of J. L. Heiberg *et al.*, revised by E. S. Stamatis, those of Archimedes by Heiberg's edition, revised by Stamatis (referred to as HS with the volume number). Ptolemy's *Syntaxis* is cited by the edition of J. L. Heiberg, his *Tetrabiblos* by that of Hübner, and his *Harmonics* by the edition of I. Düring (Göteborg, 1930).

Greek and Latin medical texts are cited, for preference, according to the *Corpus Medicorum Graecorum* and *Corpus Medicorum Latinorum* editions (referred to as *CMG* and *CML* respectively). For Hippocratic treatises not included in *CMG* I use E. Littré, *Oeuvres complètes d'Hippocrate*, 10 vols., Paris, 1839–61, cited as L followed by the volume number and page. For Galen's works not included in *CMG*, I use the Teubner editions (Helmreich, Marquardt and others) or failing them, the edition of C. G. Kühn, Leipzig 1821–33, cited as K followed by the volume number and page.

Abbreviations for Greek works are those in the *Greek-English Lexicon* of H. G. Liddell and R. Scott, revised by H. S. Jones, with Supplement (Oxford, 1968). Thus Simplicius, *In Ph.*, refers to Simplicius' work

In Aristotelem Physica Commentaria, ed. H. Diels (*Commentaria in Aristotelem Graeca*, vols. IX and X), Berlin, 1882–95.

MODERN

All modern works are cited by author's name and year of publication. Full details are to be found in the bibliography on pp. 154–69.

With the exception of 'Confucius' and 'Mencius', all Chinese names and words are transliterated according to the Pinyin convention. This is done throughout, including in the quotations from authors who use other systems.