Book Reviews

Science and Civilisation in China. vol. 2, *History of Scientific Thought.* Joseph Needham. Wang Ling, research assistant. Cambridge University Press, New York, 1956. 696 pp. Illus. $14.50.

With the appearance of this *History of Scientific Thought* (in China), Needham launches the second volume of his formidable undertaking of a seven-volume history of *Science and Civilisation in China.* Inasmuch as each volume constitutes a relatively independent unit, it seems appropriate to emphasize its subtitle in calling attention to this second volume.

The temporal span of Chinese science, as presented here, runs approximately from the time of Confucious until the merging of Chinese science into "the world-wide unity of modern science" in the 17th century. This is almost exactly the same period covered by a standard history of Chinese philosophy, such as the recently published *Short History of Chinese Philosophy* by Fung Yu-Lan. The significance of this apparent parallel rise and fall of Chinese philosophy and scientific thought is not clearly elucidated by Needham, but when it is added to the fact that the characters in the two histories are nearly identical, it emphasizes the close and continuous dependence of Chinese science on philosophy. Scientific thought is obviously closely related to philosophy in other cultures, and certainly in Europe, but in Europe the degree of that interrelationship has waxed and waned, and some of the greatest exponents of scientific thought have been indifferent philosophers, to say the least. One receives the impression from this book that no comparable waxing and waning occurred in China. When the philosophers ceased to interest themselves in scientific thought, scientific thought itself ceased.

There is some question whether this is the impression that Needham intends to give, for he frequently makes allusion to the debilitating effect on Chinese scientific thought of the prejudice of philosophers against working with their hands, and seems to suggest that there were other Chinese thinkers who did not have this prejudice. These suggestions consist, however, of references to later (and still unpublished) parts of his work, which will deal with the specific sciences and technology. Insofar as we can learn from the present work, these handworkers participated very little in the development of scientific thought.

On the other hand, it seems to be on the basis of the evidence of these handworkers that Needham frequently states that Chinese scientific thought in various areas was equal to or greater than contemporary thought in the West, and his general conclusion seems to be that Chinese thought was in advance of the West until the Western "scientific revolution" of the 17th century. That he fails to produce a clear exposition of the relationship of technology to scientific thought is a weakness of the book, but an understandable one, since it remains to be accomplished in the relatively better known area of Western science. Unfortunately it is somewhat exaggerated by Needham's insistence on the importance of this relationship that he fails to describe.

Needham concludes that the Chinese world-view depended on "a totally different line of thought" from that in the West. This conclusion is reached at the end of a long and impressively worked out chapter on the influence of the development of theories of the laws of nature on legal thinking and legal systems in the two cultures. Here, and elsewhere, he emphasizes the organic character of the Chinese world-view. He makes little use of that favorite term of historians of European science, *vitalism,* and his approach appears refreshingly original in comparison with the tendency of many writers on the history of science to view the subject in a framework of mechanism versus vitalism. A factor that aids him greatly in avoiding this framework is the apparent unimportance of mathematical thinking to the Chinese world-view. This is surprising in view of the opinion which has been commonly held of late that Chinese work in mathematics was considerable, and we may hope that Needham will cast light on this in a subsequent volume. Meanwhile, although he does not declare with any emphasis that mathematical thinking had little influence on Chinese scientific thought, he certainly does not give it a very significant role. This, above all else, gives the book a different character from that of any modern history of scientific thought in Europe.

Regardless of what criticisms may be made of various aspects of Needham's work, this volume, like its predecessor, exhibits a breadth of learning and a concern for the apparatus of scholarship, which makes it not only a monumental work in its field, but also an indispensable guide for future students in this field. All in all, the book raises more questions than it answers, but this is to the credit of the author, for the study of Chinese science in the West has scarcely been advanced heretofore to the point where one knew what the questions are. More would be unreasonable to expect of an author whose labors have laid all Sinologists and historians of science in his debt. It is also worth noting that he provides a guide to the essential portions of the book, for the "busy experimentalist" who does not have time to read it all.

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Biology of the Laboratory Mouse. Staff of the Roscoe B. Jackson Memorial Laboratory. George D. Snell, Ed. Dover, New York, 1956. viii + 497 pp. Illus. $6.

This is a new printing, unabridged and unaltered, of the first edition, which was published in 1941 by the Blakiston Company and has been out of print for some time. The rationale for this book is stated clearly by the editor, George D. Snell, in the preface: "Of all the laboratory mammals, probably none has contributed more to the advancement of knowledge than the common mouse. . . . A result of this extensive use of the mouse is that a large body of information has grown up concerning it. This, however, is so widely scattered through the literature that it is often a major undertaking for the research worker who wishes to use it to locate and gather the particular facts that he needs. Much of this information is assembled in this book."

The subject matter is divided into 13 chapters of which all but one were contributed by members of the laboratory: one chapter each on embryology, reproduction, and histology; six chapters on genetics and/or tumor formation (gene and chromosome mutations, genetics of spontaneous tumor formation, genetics of tumor transplantation, endocrine secretion and tumor formation, and the milk influence in tumor formation); four chapters on general subjects (inbred and hybrid animals, parasites, infectious diseases, and care and recording). The scope of the book is limited of necessity