

Book Review

***A Brief History of Science* compiled by Breakthrough Science Society, 8A Creek Lane, Calcutta, 2017, Pages 304, Price: Rs. 250**

Kankan Bhattacharyya*

This book contains 16 chapters based on the articles written by Professor Soumitro Banerjee. The chapters are not arranged in any particular order of chronology or topic. Each chapter gives a personal perspective of the author on the topic, based on several authentic books cited in the book. The articles are very lucidly written and are highly readable. Of course, there are some important topics in history of science, which are not covered in this book. But a book should be judged on the basis of what is written in it and not on what is not written in it.

In the first chapter, the author proposes agriculture and means of food production, as a marker of social change and not production of fire or invention of wheel or new materials. This is interesting but of course, debatable. The previous demarcation of Stone Age, Bronze Age and Iron Age is based on discovery of materials. The reason Bronze Age preceded the Iron Age is the fact that an alloy melts at a lower temperature than a pure metal. Thus Iron had to wait till high temperature smelting furnaces were developed. This chapter also discusses the progress in mathematics in Egypt. Erection of Pyramid required a great deal of knowledge of geometry which Egyptians had. Simultaneously, the Indus valley civilization invented bricks as building materials. The brick-by-brick architecture is the most advanced and followed still today, even after 5000 years. This aspect did not get adequate attention in this book.

Joseph Needham stressed the importance of invention of brick in the foreword to DP Chattopadhyay's "History of Science and Technology in ancient India."

The second, third and fourth chapters deal with respectively on Greek Civilization, Roman period (dark ages) and Science in ancient India. The author discussed in his own way, the prevailing philosophical ideas/dogmas, growth of slavery and feudalism and also mathematics. The topics are disjoint but the style of writing is smooth.

There is a big gap between fourth chapter (on Indian civilization) and fifth chapter on European Renaissance (c. 1400 CE). From 700 CE to 1400 CE, there was tremendous progress in science in middle-east, in the Islamic countries. Al-Khwarizmi (c.750-850) discovered Algebra and methods of calculating trigonometric functions. He also wrote a famous book on Indian mathematics. The word algorithm originates from his name. After this Al-Biruni (973-1048) and Omar Khayyam (1043-1131) developed mathematics further. Khayyam discovered binomial expansion. Ibn al-Haytham (Alhazen, c. 965– c. 1040 CE) published his first volume on Optics c. 1015. For this reason, 2015 was celebrated as the International Year of Light. Jabir Ibn Hayyan (also known as Geber, circa 721–815) is considered to be the father of alchemy, in the early Islamic period. The alchemists developed

* Indian Institute of Science Education and Research, Bhopal- 462066, MP, India, Email: kankan@iiserb.ac.in

many chemical procedures and discovered many new chemicals. Another great omission is the ancient science in China. There were numerous exchanges of knowledge with India and China with middle-east, principally through the Silk Route.

Fifth, sixth, seventh and eighth chapters deal with post-Renaissance European physics up to Industrial revolution in late 18th century. The ninth chapter on chemistry starts with Lavoisier and related development in 18th century.

The tenth chapter (this is not correctly mentioned in the table of content) is a nice discourse on causality and determinism based on the arguments of Kant (1724-1804) and John Stuart Mill (1806-1873).

Eleventh chapter focuses on evolution. Author has correctly described the connection between Hegel's philosophy and theory of evolution by Darwin (contribution of Alfred Wallace, FRS on evolution is ignored in this book). Perhaps, the fifteenth chapter on Genetics should have been placed immediately after eleventh chapter, for the sake of continuity.

The twelfth chapter deals with scientific materialism developed by Marx and others. The next chapter is on positivism and decline of determinism. The fourteenth chapter on quantum mechanics comes very naturally, after this philosophical discourse.

The sixteenth chapter deals with Indian renaissance led by Raja Rammohan and Vidyasagar. I am particularly impressed by the note of Vidyasagar on the need of teaching Stuart Mill's inductive logic in India. In 1853 Vidyasagar wrote, "That the *Vedānta* and *Sāṅkhya* are false systems of philosophy, is no more a matter of dispute. These systems, false as they are, command unbound reverence from the Hindus. Whilst teaching them in Sanskrit Course, we should oppose them by sound philosophy in the English course to counteract their influence." Because of the debate between Vidyasagar and Ballantyne on this issue, Vidyasagar resigned as Principal of Sanskrit College in 1858.

I hope all positive thinking Indian would follow the progressive views of Vidyasagar and continue to search for truth, in a scientific way. I strongly recommend this book to all Libraries.