No comprehensive and authoritative history of science and technology of India has till today been written that would be evenly remote comparable to the achievement of Joseph Needham (1900-1995) for China, through his still continuing series Science and Civilisation in China or SCC (1954-). One of the reasons is no doubt that much substantial spade work on the history of science and technology of India remain to be done before such an encyclopedic project can be undertaken.

Saraju Rath


JUST AS MUCH OF HIS OTHER RESEARCH, the present work of Prof. Dr. Sreejumala Rajeswara Sarma would provide a reliable basis at least for important sections of an SCC-like history of science and technology of India. This also applies to a still ongoing project of Prof. Sarma, a descriptive catalogue of instruments in all private and public collections in India and abroad, with historical surveys of the development of each instrument-type, its use and generation, and its description in all the main Sanskrit and Arabic works. The first part of this latter project is the treatise of uncertain date”, but which “in the manuscript collections is associated with the works of Rüdwin (c. [C.E.] 1200), contains six perpetual motion machines, all gravitational- motion. One of them is identical with Bhāskara’s mercury wheel with slanted rods, whereas two others are the same as the first two perpetual motion projects to appear in Europe: the architect and engineer Villard de Honnecour’s wheels of pivoted hammers and half moons respectively of about 1237. In an anonymous Latin work of the later fourteenth century we find a perpetuum mobile very like Bhāskara’s second proposal, that is, a wheel with its rim containing mercury. We may thus be sure that about [C.E.] 1200 Islam transmitted the Indian concept of perpetual motion to Europe, just as it was transmitting at the same time the most important elements in positional reckoning. Leonard of Pisa’s Liber Abbé appeared in 1202. The reception of the idea of perpetual motion in thirteenth-century Europe, according to White (ibid. 523), stood in a marked “contrast to India and Islam”, as in Europe there are “indications of intense and widespread interest in it, the attempt to diversify its motors, and the effort to make it do something useful”.

Two parties of opposition against Lynn White’s thesis Lynn White’s thesis which attributes the idea of perpetual motion to a late thirteenth-century Hindu treatise and hence the foundations of modern power technology to a 12th century Indian text by Bhāskara was, as Sarma points out, “contested from two sides, one holding that such machines were known to the Arabs long before Bhāskara’s time, and the other claiming that both the Indian and Arabic accounts owe their inspiration to China”.

In their Islamic Technology: An Illustrated History (Cambridge Univ., 1986), Ahmad Y. Al-Hassan and Donald R. Hill argue (p. 56) that the Arabic technical descriptions and diagrams in his book (AE, p. 27) gives a good impression of the varieties of automatic devices, “both called perpetuum mobile”, in the circulation of knowledge in pre-modern Eurasia. Sarma’s work is a goldmine of well-researched historical information, of sound judgements, of references to primary sources (especially in Sanskrit and Persian), on the history of science in India and of references to specimens of Indian scientific instruments in India and abroad. And as I have briefly indicated here, Sarma’s work is of direct importance for the ‘Divergence’ discussion. In short: it is must for all historians of Indian science and for anyone interested in the global history of science and in the circulation of knowledge in pre-modern Eurasia.

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Figure 1. above The perpetuum mobile according to Brahmagupta (after AE, p. 65).

Figure 2. below left Drawing of a Sankriti astrolabe manufactured in 1688. (after AE, p. 255).

Figure 3. below right "Astrologers explaining the horoscope to the king" with water clock (sinking bowl type) and ring dial in front from the Akkemana, © The British Library Board. (Mad. Or. 12588, folio 20b) (AE, p. 111)