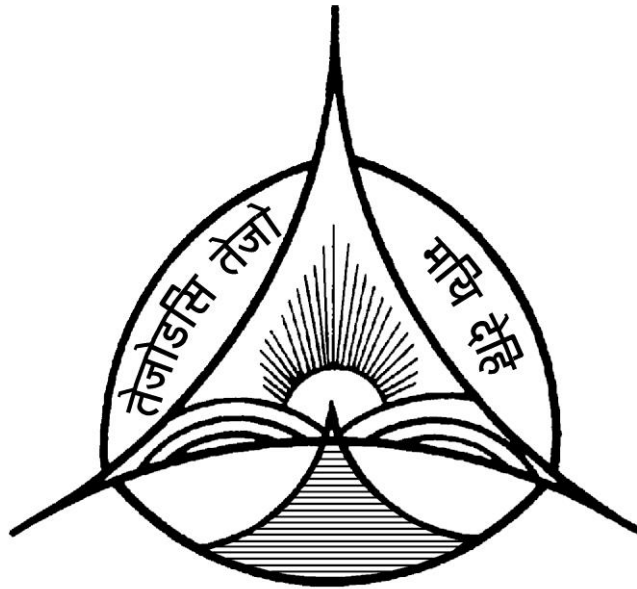


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Science in Saffron: Skeptical Essays on History of Science by Meera Nanda, New Delhi: Three Essays Collective, 2016

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The discipline of social history of science in India is dispersed across many fields of investigation, varying from exhaustive analysis of colonial roots of science and critically dissecting the Western notion of ‘scientific rationality’ to understand popular and practical uses of science within the complex social fabric of India. As one of the prominent faces of the discipline, Meera Nanda foregrounds the universality of scientific reasoning along with the different trajectories of development of science in different historical contexts, and many of her prominent works are vehemently critical of the right-wing and the appropriation of science for a Hindutva agenda. Nanda’s latest book is to be read along this existing corpus of literature. Apart from being a timely intervention in the ongoing right-wing onslaught on India’s culture and economy, Meera Nanda’s book is an engaging read, both for its provocations and nuanced observations. The book, according to its author, is an attempt at the necessity to counter the ‘logic’ of cultural appropriation of science by the right-wing in India by endorsing the relevance of scriptures or traditional narratives on the one hand, while on the other, aiming at retrieving science from ‘fashionable post modernist ventures’.

Nanda’s book is a quick response to the controversial Science Congress held in 2015, which saw Prime Minister Narendra Modi and other scientists making claims of scientific advancements such as genetics and plastic surgery as having been part of ancient Indian tradition much before any modern achievements. The author structures the book into four chapters by singling out four different aspects of science that the right-wing is eager to reclaim as ‘always already’ built into the traditional fabric of Indian culture. This work stands out as an exemplary read for its political project of countering right-wing dalliances with the history of science. The author systematically opens up strands of contentious histories by unravelling numerous civilisational exchanges into what has emerged as science in its contemporary form.

In the chapter, ‘Who Discovered the Pythagorean Theorem?’ Nanda highlights the different contexts in which the Pythagoras theorem developed, more specifically as practical explanations to the problems that different civilisations explored in their specific contexts. The chapter traces a comprehensive history of the theorem through different civilisations—from Egypt and Mesopotamia, to Pythagoras’s contribution, to Baudhayana (a group of Vedic Sanskrit texts) and the Kou-Ku theorem. In Nanda’s view, the true discovery of Pythagoras was not perhaps the theorem itself, but the laws of nature and the existence of irrational numbers. This followed from the discovery that music is governed by certain numerical ratios, and that the significance of the numbers and ratios is tantamount to understanding the ‘Ultimate Reality’ which governed Pythagorean thinking. The existence of irrational numbers, found later, was a significant blow to such an understanding. This crisis left by the

discovery of irrational numbers was, however, fundamental in further developments in Greek mathematics, most prominently among them being the separation of geometry and arithmetic.

Interestingly, the *Sulvasutras* of the Baudhayana period did contribute to the same—even though deductive reasoning which was unique to the Greek tradition was absent in this tradition. What Nanda effectively brings out in this chapter is two-fold: on the one hand, she critically examines the Eurocentricity of the project that has gone into history writing, while on the other, her belief rests on not making science a competitive sport and that a meaningful history of science has to do away with the ‘one-upmanship game’. Thus, the claims of who discovered the Pythagorean theorem first of all is a meaningless exercise for her, as each context has to be analysed in the specificity of problems that were thrown up to different mathematicians at different periods. By closely considering the ingenious multiple ways of problem solving across generations of mathematicians, the contributions of the *Sulvasutras* are given their due, rather than claiming the superiority of one over the other.

It is this position taken by Nanda that makes her critically read the history of the digit Zero in her chapter, ‘Nothing That Is: Zero’s Fleeting Footsteps’. Commonly associated with such a history is the role that India had played in being the inventor of this number. She says that this assertion is more specifically attributed to being an entirely Hindu contribution to world mathematics. She questions the homogeneity of Indian culture and the mathematical system itself by employing the approach of comparative history. She begins by questioning the unidirectional history of science as flowing from India to China and seldom otherwise. Drawing upon Needham and Lam Lay Yong, Nanda sets out to demonstrate the counter narrative that one picks up from such writings on the history of science. For Nanda, Indian civilisation’s contribution of zero is important, but not something that can override the entire historical account of the decimal system or place-value that has existed in different cultures. She makes it clear that the significance of zero comes only with the place-value system, where the numerical representations warrant the use of zero. One of the earliest instances of the decimal system in the Indian context were those in the Vedas, where there was a systematic numbering of the *slokas*. Different civilisations used different means of counting, from the abacus in the Greco-Roman tradition to counting rods in China. While there are many claims of Indian tradition’s penchant for large numbers, Nanda cites from other traditions to state that this was not something unique to India alone.

Nanda takes a political moment of great controversy and turns it into an educative moment in the history of science in her chapter, ‘Genetics, Plastic Surgery and Other Wonders of Ancient Indian Medicine’. The Science Congress in 2015 saw claims from both scientists and from Prime Minister Narendra Modi, invoking incidents from Indian mythology such as Karna’s birth outside his mother’s womb, and Lord Ganesha’s elephant head with a human body, as evidence of ancient India’s expertise in genetics and plastic surgery, respectively. While the absurdity can be laughed off, and it should be, in the present context of right-wing ascendancy and the RSS’s ideological resurgence, the danger is of injecting these same notions into school curricula (as the author herself notes in another instance). Even more dangerous is the manner in which the present is compared to picture the past as always modern, which nationalism effectively capitalises on. Examining the *Caraka Samhita*, in which ancient Indians attempted to understand the human body closely, Nanda reminds

readers that however one might stretch the argument, it still does not hold currency for genetics as a science to be known of then. The book claims that while we had a partial theory of heredity, there was nothing that could be claimed as genetic science. Nanda attributes significant importance to the *Susruta Samhita* which was a paradigm shift from the early magico-religious practices to a method of direct observation. However, the Brahminical logic of purity and pollution which governed ancient practices in India greatly affected the advancement in this learning. The author, while attributing appropriate credit to the developments in medicine in ancient India, alerts us to the fact that we should see it as a ‘cautionary tale’—a tale that pulls us closer to the pervading social hierarchies within the society which are very much a reality even today.

The final chapter focuses on the scientific status accorded to Yoga through the dynamics of the encounters between the East and the West, as it was mediated by the interventions made by Swami Vivekananda. Vivekananda’s own intellectual journey in India can be traced through the influences of social reformers like Ram Mohan Roy, Debendranath Tagore, Keshub Chunder Sen and the like. Nanda notes that the space that Yoga occupied in the West is a space that Vivekananda created for Hindu religion itself, as something of a ‘rational religion, a religion of science and Yoga is its scientific method, its method of verification’. Beginning with a critical discussion of Vivekananda and his philosophy, Nanda inspects *Rajayoga* (Vivekananda’s text published in 1896 which introduced Yoga philosophy to America) and the layers of ‘resemblance thinking’ embedded in it, which, as she points out, are also a source of Yoga’s conversion into a pseudo-science.

When Vivekananda discussed Yoga, he accorded it a status that surpassed anything which Christianity as a religion had to offer. For, the emergence of alternate forms of religiosity in the West was considered to be an escape from the ‘irrational dogma’ of Christianity on the one hand, and the ‘dogmatic rationality’ of the Enlightenment on the other. ‘Rewriting’ the terms in Patanjali’s *Yogasutras* through modern scientific terms, and in turn reigning in the method of resemblance thinking, was how Yoga was made popular in the West. Far more than a mere mysticism of the East, according to Nanda, it is this perfect blend of the ‘scientific’ with the spiritual core that validated Yoga’s wider popularity in the West.

The real contribution of Nanda’s book might not be so much to the history of science, since the historical consolidation of the civilisational exchanges is a narrative that would be familiar to many historians of science, with agreements and disagreements. And yet, the book is also much more than a simple elaboration of science and its history; it is a reminder of the political commitment of the discipline to epistemically claim itself from right-wing appropriations. Nanda’s appeal through the present book is to a wider readership, to introspect the common assumptions of science and the many shared beliefs about its historical development. The book’s political project can be extended to understand the contemporary neoliberal market politics that the right-wing fiercely endorses. Like Nanda’s past works, *Science in Saffron* also successfully disentangles not just myth from reality and science from pseudo-science, but also forcefully places itself in the complex arena of contemporary politics and culture.