

BOOK REVIEW

Quantity vs Quality in Science Studies Literature

S P GUPTA, SCIENCE AND ITS METHODOLOGY, Ajanta Publications, Delhi, 1978, Rs 25.

S P GUPTA, LOGIC AND SCIENTIFIC METHOD, Ajanta Publications, Delhi, 1978, Rs 29.

S P GUPTA, SCIENCE, TECHNOLOGY AND SOCIETY IN THE MODERN AGE, Ajanta Publications, 1978, Rs 54.

S P GUPTA, MODERN INDIA AND PROGRESS IN SCIENCE AND TECHNOLOGY, Vikas Publishing House, 1979, Rs 45.

CLAUDE ALVÁRES, HOMO FABER: TECHNOLOGY AND CULTURE IN INDIA, CHINA AND THE WEST, 1509 TO THE PRESENT, Allied Publishers, Delhi, 1979, Rs 60.

THERE exist four categories of scholarly writing in any area: creative writing which generates new ideas and new criticisms; good writing which bases itself on old works but makes an advance in interpretation; competent writing which systematically represents available thinking in the field, and bad writing which manages to mess up even the existing ideas. The books under review give us a taste of both extremes in some recent publications on science studies.

When an author brings out four books in a little over a year, either he is exceptionally brilliant or the substance of the work is of dubious quality. S P Gupta's four books, all published between 1978 and 1979, do not come anywhere near establishing his brilliance, or even his competence. He has managed to transform the very existing area of science studies into dull, distorted reading. The books are a bad imitation of a very restricted tradition in western thought which has already been criticized and is outdated, and for that reason alone they are undeserving even of critical attention. However, our attention is being forced to them

because such works are somehow enlisted as text and reference books in various universities.¹ Such publications might create an illusion that they are helping in getting rid of imported material, and hence of intellectual domination by the west. But if Gupta's books are representative samples of such an alternative, we are merely sacrificing quality without any advantages of intellectual autonomy or economy. Such publications have nothing new to offer while they manage to put what is already available in a very bad perspective.

Logic and Scientific Method and *Science and its Methodology*, as the titles suggest, overlap in most parts. The only difference lies in the additional sections on introductory logic in the former which in no way can substitute the already existing and widely available material on the subject. No attempt is made to consider the Indian logical systems because Gupta seems to believe that Indians did not know of logic till the westerners introduced it to the country. Thus, in *Science and its Methodology* he writes that "India had no science until the Europeans established themselves in this country. Therefore there was no scientific activity, much less the scientific method. Testimony and authority of classical learning reigned supreme. Empirical knowledge was not cultivated. Rationalism and logical thinking were at a discount." These interpretations of Indians as an unthinking people are based on British accounts of the primitive natives. It is painful to see them passed on as rational analysis in independent India by Gupta. This colonial approach to the Indian mind will be taken up in detail in the review of his last book. Here we can only presume that under these misguided assumptions, all that Gupta is attempting is a review of western scholarship in scientific methodology. However, even in this limited task he has failed miserably.

To begin with, he has not even addressed himself to the most topical issue in philosophy of science: Is there a scientific method? In a book on methodology of science written in 1978, there should have been a reference to Kuhn, Feyerabend, Polanyi, Bohm and Bunge² whose views form the base of a new philosophy of science which provides an alternative to the misleading presuppositions of positivism and logical empiricism. The radical and Marxist philosophers of science have taken serious objection to the belief in neutral observation as a source of objective knowledge in science. They have thrown doubt on the assumption of a scientific method which can be codified and articulated. Scientific activity is shown to be much more complex than what a naive positivistic approach takes it to be. Convincing arguments have

been put forward that reveal that observation is theory laden, and science, like other forms of knowledge, has no neutral data. Philosophers of science all over the world have been discussing these issues for more than a decade now. Yet Gupta continues to write, without justification or support, that "observation is seeing an object or phenomena with an open mind".

Central Problems Bypassed

May be his writing the books under discussion could still be justified on the ground that he is not reviewing all of western philosophy of science, but only the positivistic approach. But again we are in for a disappointment. No systematic presentation of even the orthodox view of science emerges in the two books. None of the central problems that scholars like Carnap, Nagel and Hempel³ found relevant to empiricism are touched by Gupta. Problems such as the relationship between observational terms and theoretical terms, the problems in the logic of confirmation, which have plagued philosophers of science of the positivistic tradition since its inception, have also been left untouched by the author. How little Gupta understands of these fundamental methodological and epistemological issues is clear by his not being troubled with the coexistence of verificationism and falsificationism, of inductivism, and hypothetico deductivism. The books are full of confusions such as the following. On page 40, in a section where he discusses theory, he states that "putting forward a systematic theory of phenomena is done by deduction" (deduction from what?). On page 38, on the other hand, he mentions that "from the empirical results we derive a theory, which is a logical system". Anyone who has an elementary knowledge of inference knows that going from facts to theories involves *inductive* inference and not deductive inference. With Gupta making such elementary blunders, it becomes too much to expect him to be aware that philosophers no longer think of theories as logical systems. Gupta has failed even in the limited programme of providing a systematic review of the logical analysis of scientific theories and scientific methodologies according to the positivistic tradition.

From the titles of the other two books by the same author, *Science, Technology and Society in the Modern Age* and *Modern India and Progress in Science and Technology*, one expects the former to be an analysis of the social context of science in general, and the latter to be about the social origins of science in India. However, of the 12 sections in the former only two discuss social aspects of science and technology. The subject matter of the rest of the eight

sections is more in the line of logical, and not social analysis of science. A large part of this material can also be found in his books on logic and scientific method. Besides the misleading title of the book, it suffers from some serious omissions. Though the book is claimed to analyse the social context of science in the modern age, it contains no reference to eminent scholars like Solla Price, Merton, Ravetz, Halton, Rose and Rose, Barnes, Mulkey and many others who have contributed significantly to this field.

Shabby Production

The Vikas publication on science and technology in India does not suffer from the lack of connection between the title and the substance of the book. It is, however, very shabbily and ideologically written. The shabbiness is exemplified by the complete absence of footnotes references, or even a bibliography. Being a historical work, it has definitely used a lot of references to which no acknowledgement is made. Besides being unfair to earlier authors whose works Gupta uses, it is unfair to the reader who might want to search deeper into the history of Indian science. For any work on social history of science in India the work of Rahman and Sen⁵ should obviously form the basic background. The work is ideological because it reiterates Gupta's view that Indians were taught how to think and be rational by the British rulers. Not only does it do injustice to the capacity of all human beings to think rationally irrespective of when they lived and where they lived, it also represents the introduction of western education in India as a benevolent step taken by the Britishers, without exposing their racist and exploitative policies. The work is a mere report of the educational and research institutions in India set up by the British and it does not look into the conflicts that went into their creation. The work is chronological, not historiographical. For interested readers one alternative resource that does go into the social context is S N Sen's article on "Introduction of Western Science in India during the 18th and 19th Century".⁶ Sen discusses the limitation of European scientific work in India to field sciences, the commercial motivation for such restrictions, and the British rulers, policy of exclusion of Indians from any effective participation in government scientific undertakings.

The later chapters in Gupta's book are a report of the scientific establishments set up in post-independence India, and naturally less faulty than his analysis of the introduction of western science in the country. However, more detailed and informative

reports are already available on these institutions which Gupts must definitely have used, but failed to mention.

None of the four books by Gupta provides new insights nor are they an improvement over earlier writings on the subject. They are an example of quality of work being sacrificed for quantity of work. Academics would not have been seriously affected without their publication.

Claude Alvares's *Homo Faber* is in striking contrast to the books discussed above. While in Gupta's four books themes and quotations from various sources are taken in bits and pieces and put together just to make a book and not say much, in Alvares's work, the wide ranging references relate to each other in a deep and meaningful way, consistently bringing out a very dynamic thought pattern of the author. To its readers, this book makes a contribution which is unique in the sense that the fundamental aspect of all these references have been included, not to reduce their significance, but to generate an altogether novel piece of scholarship.

Refreshing Change

Alvares's central theme is diametrically opposed to Gupta's identification of the introduction of rationality in India with western domination. His own justification of the book best expresses his radical view point that rationality is not limited to groups historically or socially exposed to western systems of science and technology: "Therefore, in a sense, this book. There should be no ground for misunderstanding: this book carries no intent of defending the attitudes and perceptions of the poor, especially that large silent majority of low-income, permanently insecure groups in the southern states. They need neither a defender, nor a defence. If, on the other hand, this book lays any claim to originality that might lie in its indication precisely of their achievement, the nature of which has less to do with the fact of their remaining alive. . . . The economically insecure man in the southern nations is also, however, engaged in the task of survival. Considering the range of odds against which he must struggle and his experience thus far in using all his wits about him to remain alive, he comes very close to being an engineer par excellence. The technology he uses is not invented for the maximisation of profit, it is instead, a *survival technology*. Fully half the population of today's world are survival technicians; they do not exploit the western technological system. They are craftsmen of necessity, and that necessity is in a very real sense rationally engaged" (page 15).

Chapter one of the book puts forward a new philosophy of technology and culture which counters the common myth of western man as the most advanced and the most rational. As the author puts it, "the basis for this belief is the specious assumption that there is but one form of technological development, the most advanced and the best, that which came to fruition in the history of the western world. The implication of such an assumption is worse: the discounting of any capacity in the southern nations to solve their own technical problems" (page 18). The author discusses non-western technological systems with a rich resource of references to stress the point that non-western cultures have been technologically productive and rationally active to the present day.

Indian Technology and Culture

Chapter two takes on a discussion of Indian technology and culture from 1498 to 1757. It deals with specific illustrations of Indians rejecting foreign scientific and technological inputs on the grounds of rational decision making, and not, as Gupta would have us believe, because of the stranglehold of traditions. Chapter three deals similarly with China during 1368-1842. The fourth chapter lays the groundwork for the remainder of the book by looking into English technology and culture from 1500 to 1830. The next chapter deals with the colonial impact of these developments. Chapter six covers the period beginning 1850, and focuses attention on the indigenous Chinese and Indian attempts at technological and cultural independence vis-a-vis the west. Finally, in the last chapter, Alvares lays out a logic of "appropriate technology", which brings together implications of what has been earlier developed through critical historical investigation, and provides the philosophical preconditions for an alternative model of development. Alvares here succeeds in making an argument for the rationality of non-western cultures. Even more, he indicates that this rationality is superior in meaningful ways to the rationality of the west. Glimpses of western irrationality are provided in the following extracts: "It is necessary to ask how nations with more than forty per cent of their best scientists and engineers engaged in the production of weapons to destroy human lives all round the world can advise the southern nations to use 'appropriate technology'" (page 240). "The number of westerners who have come to regret that their societies ever placed their economics higher than man himself is not to be underestimated," (page 242).⁷