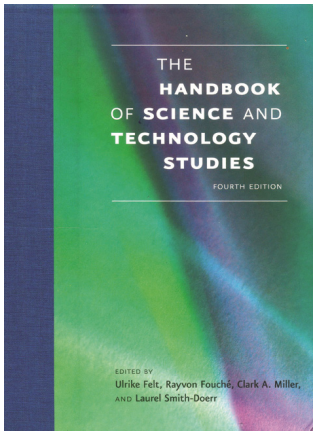

The Handbook of Science and Technology Studies, Fourth Edition. Ulrike Felt *et al.* (eds). The MIT Press, Massachusetts Institute of Technology, Cambridge, Massachusetts 02142, USA. 2017. xii + 1190 pages. Price: US$ 75.00/£58.00.

This is a huge book of over 1000 pages and fourth in the series of similar Handbooks officially associated with the Society for Social Studies of Science (4S).

What does a book such as this accomplish? One, it shows the wide diversity of approaches, methods and themes in understanding the activity of science from a broader social perspective. Ideas and products do not arise in an epistemological vacuum. Every new thought in science is a product of various social factors, including forms of institutionalization, collaboration, access to resource, access to network, and so on. Science and Technology Studies (STS) exhibits the full richness and complexity of the social practice of science. For this reason, such a Handbook would be valuable to those who are interested in the question of these links that make science possible as well as professionals in the field who can have access to a list of contemporary themes, approaches and references.

What can such a book accomplish in the Indian context? Handbooks such as these are extremely important in the Indian context. In India, there is a strong resistance to the professionalization of science and technology studies. The blind support to science education, the destruction of quality education in the social sciences and humanities, excessive glorification of the scientific method are some of the reasons why it has been impossible to establish programmes in science studies in the country. Added to this is the 'power' of scientists within the political establishment, which has led them to corner much of the funds which are allocated to research and education in India. Ironically, it is a small group within the scientific community which has also decided to act as spokespersons for science and its social linkages. While it would be quite difficult for the social scientists to get any money for research in STS, the science academies and some senior scientists have the clout to get funded programmes in science and society, science and ethics, and so on. They also have money for projects on the history of science, science and art, and similar topics, while outside the scientific community it is quite impossible to find such support.

This hegemonic appropriation, not just of the doing of science but also of the interpretation of science, by Indian scientists is deeply worrying and should be addressed as a major sociological issue. A major part of the reason for this appropriation is that the scientists want to control the narratives about science, and keep it within the 'family' as it were. Like the religious leaders who regulate how religious texts should be interpreted, the well-funded scientific groups within the country do the same with respect to science as a whole.

So it is no wonder that they have resisted, where possible, any establishment of a meaningful sociology of science and technology (S&T) in India. This is not only ironic, but also dangerous to the Indian society. For a society which boasts of one of the highest number of scientists and technologists in the world (with some accounts putting India in the third position), leaving all the policies, communication and justification of S&T in the hands of a small group of self-interested scientists is disastrous for the future of the country.

Scientists and administrators have understood this well across the world. Even small countries have established centres for history, philosophy and sociology of S&T which are staffed by professionals in these fields. There are educational programmes offering professional degrees in the history of science, philosophy of science and sociology of science across the world. In India, we have not been able to establish any kind of professional organization or courses because of this dangerous nexus of powerful voices within the scientific community. The resistance to such studies has become so significant that scientists from well-endowed public institutions use a rhetoric of fear and intimidation to stop the establishment of these disciplines. They repeatedly invoke the image that the larger society is filled with blind belief and superstition, and that it is only their scientific work which would liberate the country. Such politically charged and epistemologically flawed accounts still continue to be used to stop any meaningful attempt to understand the complexity of the activity of science by 'non-scientists'. Unfortunately, successive governments, along with corporate interests, have continued to tacitly support such rhetoric since it serves their purpose. Thus, consciously or otherwise, the Indian scientific community has become a plaything for these political and commercial interests.

At the same time, this inward attempt by scientists to insulate themselves from other disciplines has not led to any great science. On the contrary, the impact of most of the work done in the country over the last few decades has been average at the best. Most of us know why this is so: the problems with science education influenced by the naive rhetoric of science, the unprofessional administration of science in India, and so on. An attempt to understand all these factors in the production of science is to do STS professionally.

These remarks about Indian science are necessary if we are to understand how to engage with this book. Bringing out a Handbook with so many chapters is not easy and the editors have done a commendable job. They trace a brief history of this Handbook, as it is the fourth edition. The first Handbook was published in 1977, the second in 1995 and the third in 2008. Each of these editions contributed to the establishment and growth of STS. The fourth edition, as the editors point out, comes at a time when the discipline of STS is well established as both research and teaching programmes.

Interestingly, for this edition, the editors decided to respond to a well-established problem within the field, as in other academic disciplines. They consciously attempt to include 'non-Western S&T' in the Handbook; the result is that 5% of the authors come from institutions

in Asia and one-third of this 5% from South America. If this is the outcome of a conscious attempt at inclusion, then it says much about the inherent prejudices and imbalances in the field itself. While other disciplines can escape this criticism by hiding behind disciplinary protocols, for this to happen in a field like STS should be seen as a monumental failure.

This is a tragedy given that in terms of active scientists as well as the number of consumers of S&T, India and China far outweigh the rest of the world, particularly the small sample of Western countries which see themselves as the sole custodians of this field. In terms of technological leadership in the commercial domain, like in information technology, Indians and Chinese have become influential leaders. Yet the STS community seems to believe that the deliberations by a few – and among the few – are enough to capture the complexity of this global process. If we do a sociological analysis of the authors, their institutional affiliations and connections to the other authors (as students, colleagues, etc.), would it illustrate one more instance of academic cronyism? The extensive references in each of these chapters, which are all oblivious to the need to draw upon the literature in other parts of the world, perpetuate this myth that STS does not – and cannot? – have meaningful contributions from the rest of the world. So why should the rest of the world bother to engage with such books?

I mention this because to read this book one has to first overcome this myopic vision of STS itself. So how are we to read this book in order to understand how science functions in India? How our scientific institutions do what they do, how science in the public domain is able to continue its rhetoric, how it speaks to the kind of science that is being done in our laboratories, or the ways in which this science is being done here?

In continuing this hegemonic, and self-indulgent, presentation of the field, the book ends up duplicating the same problematic structures of science itself. Given that STS as a discipline has the capacity for self-reflection, unlike science, it is all the more unpardonable to continue to produce such texts without being aware of the exclusive and hegemonic politics behind it. But we should also realize that such brazen rejection of worldviews and practices from the global South is possible only because we, within India, do not develop any critical, autonomous tradition based on our ideas and experiences. The point in reading such books is not to reject them – for there is much to learn from them – but to use them once more as a mirror to see where we have gone wrong and how we do not learn anything from our mistakes.

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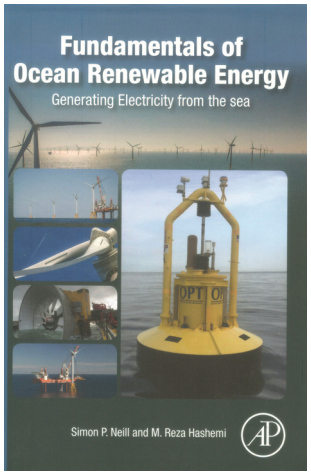

Fundamentals of Ocean Renewable Energy: Generating Electricity from the Sea. Simon P. Neill and M. Reza Hashemi. Academic Press, An Imprint of Elsevier, 125 London Wall, London EC2Y 5AS, UK. 2018. xv + 319 pages. Price: US$ 149.00.

The world population is growing rapidly and this puts a large demand on energy, resulting in depletion of natural resources. Due to the increase in population, economic expansion and increase in transportation, the global demand for energy consumption has increased in the last 50 years. Hence, man is looking for renewable energy for his survival. The main sources used globally to generate electricity in the year 2014 were coal (41%), natural gas (22%), hydropower (18%) and nuclear (11%). Currently, renewable energy sources like wind, solar and biomass contribute only ~5% of the energy. Seventy-one per cent of the earth's surface is covered by ocean and most of the sun's energy is transferred to the ocean through heat and wind. The sun and moon cause tides and tidal currents in the ocean. Hence, ocean is a vast source of renewable energy. This book covers the most significant progress in almost all the renewable energy sources from the ocean, i.e. wave, tide, current, ocean thermal energy conversion and salinity gradients along with the offshore wind. It is a single source for vast information related to ocean renewable energy, including fundamental physics and the theory behind ocean energy systems from both oceanographic and engineering perspectives.

This book can be used for teaching courses dealing with marine renewable energy in both marine science and engineering disciplines. It can also serve as a reference book for scientists and engineers working in academia/industry in the marine renewable energy field. The authors have vast experience, both academic and industrial, in the fields of fluid dynamics, coastal engineering and renewable energy, and hence have been able to include various topics in a logical sequence. The subject is covered in 10 chapters starting with the importance of renewable energy followed by basic hydrodynamics and the focus on different sources of energy from the ocean, including its resource assessment and most widely adopted conversion technologies.

The introduction to the subject in the first chapter highlights the impact of climate change and the need to go for renewable energy along with the basic concepts of energy and power. The most predictable ocean energy, i.e. tidal energy is covered in chapter 3. The generation of tides, their propagation, prediction of tides and the fundamentals of tidal energy are all discussed sequentially. Offshore wind energy, one of the fastest growing renewable energy sectors is discussed in chapter 4. The crucial step in identifying the location for a wind energy devices is resource assessment, which is discussed in detail in the book along with technical aspects of offshore wind energy. Marine spatial planning of an offshore wind farm is a complicated process involving technical, economic, ecological, societal and legal aspects, and the book briefly covers all of them. High energy density is contained in ocean waves and hence they have the potential to become an economically viable renewable energy source. The various wave energy converter technologies are introduced in chapter 5