

Sandra Harding (ed): *The Postcolonial Science and Technology Reader*

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In 1998, the American philosopher Sandra Harding announced the beginning of “a second historiographic revolution” in the history of science: Three decades after Thomas Kuhn and others had turned their view towards “the historical integrity of [...] science in its own time”¹ with respect to economic, political, social and cultural circumstances, postcolonial science and technology studies started to add a geographical dimension to the historiography of science. Transcending the European frame of reference, this new approach wanted to address the history of non-European science and technology projects and the relationships with their European counterparts.² Today’s postcolonial science and technology studies analyse how Western imperialism and colonialism became inscribed into scientific theories and practices and how this inherent connection continues to shape encounters between ‘the West’ and ‘the rest’ in the present. Work in this field includes critiques of the construction and use of scientific knowledge as a power base for the control and subjugation of non-European people and the simultaneous eradication of their scientific and technological traditions, as well as appreciations of the validity and usefulness of ‘indigenous’ knowledge systems. A third approach highlights processes of knowledge transfer and appropriation between different knowledge traditions and thus questions the perception of local sciences as self-contained entities. Almost 15 years after her announcement, Sandra Harding now records a “splendidly flourishing literature” on these subject matters across various disciplines and languages. (p. xi) In her *Postcolonial Science and Technology Studies Reader*, she assembled 25 articles and books chapters on science in a postcolonial world, most of which appeared shortly before and after her programmatic statement of 1998.

The volume’s contributions are organized into four sections: ‘Counterhistories’, ‘Other Cultures’ Sciences’, ‘Residues and Reinventions’, and ‘Moving Forward: Possible Pathways’. The thematic arrangement of the texts roughly reflects interacting disciplinary efforts that have been involved in a postcolonial study of science and technology, such as

¹ Thomas S. Kuhn (1970), p. 9; cited in Sandra Harding (1998), p. 1.

² Harding (1998), p. 5.

history, anthropology, social theory and science policy. To each section, Harding provides a short preface recollecting some pioneering and supplementary work in the field, outlining key problems and guiding questions and relating them to some of the featured texts. The anthology is complemented by the editor's comprehensive introduction, in which she outlines how the frameworks of postcolonial and feminist theory can help to develop new approaches to questions of science and technology studies. In Harding's view, as counter-narratives to the triumphalist and exceptionalist depiction of Western science in traditional accounts, feminist and postcolonial projects will have to acknowledge and appreciate "a world of sciences"—a multiplicity of scientific and technological traditions (p. 9)—not least because it is "through recognizing the distinctive strengths and limitations of other cultures' knowledge systems, one can strengthen the objectivity, rationality, and "good method" of modernity's own knowledge systems." (p. 154).

The volume's first section collects 'counterhistories' intended to challenge the contention that "[i]t is our [European] civilization and unique characters, abilities and skills from which emerged modern scientific rationality and technical innovation." (p. 34) The adaptation of Arab, Indian and Chinese scientific and technological knowledge (John M. Hobson) as well as the overseas activities of European corporations such as trading companies, colonial administrations and religious orders (Steven J. Harris) played a significant role in the knowledge production of various disciplines of Western science. The "big sciences" (p. 77) connecting different parts of the world in their research also entailed the creation of a particular space for the construction and application of gender categories. As Mary Terall shows in her chapter, explorers styled themselves in their travel accounts as heroic masculine risk-takers venturing into the unknown, thereby gendering scientific practice and confining women to the role of the reader. European naturalists in the seventeenth and eighteenth century—among them also women like the Dutch Maria Sibylla Merian (Ella Reitsma)—also collected plants for commercial and medical use. This 'prospecting' (Londa Schiebiger) crucially depended on the botanical and healing traditions of indigenous and slave populations, while metropolitan botanical gardens such as the Kew Gardens in London (Lucile H. Brockway) were converting botanical knowledge and the global transfer of plants into imperial power. Expertise could also travel with (female) slaves as in the case of rice cultivation and processing from Africa to America (Judith Carney).

The book's second section provides examples of 'Other Cultures' Sciences' and seeks to underline their relevance in an increasingly globalized world. Local navigational (Ward H. Goodenough) and hunting (Colin Scott) knowledge systems are shown to work extremely well in their particular environments—while having a very similar function and fundamental structure (e.g., with respect to the use of metaphors) to Western sciences. 'Indigenous' environmental and biodiversity expertise on the other hand is seen to be crucial in tackling global environmental problems. By incorporating the knowledge embedded in different languages which are each fine-tuned to their environment (Peter Mühlhäusler) and agricultural and conservational expertise of women which has long been undervalued (Helen Appleton et al.), alternative and more sustainable development models can be devised. According to some authors, new instruments are needed to ensure that the local communities have a share in the commercial value of their biological resources and knowledge (Stephen B. Brush) and dispose of intellectual ownership and control (Appleton et al.). Existing efforts to map and record indigenous (oral) knowledge resources are described in the contribution by D. Michael Warren.

The third section traces 'Residues and Reinventions' of the colonial and imperial worldviews in modern social and scientific theories. Development theory (Arturo Escobar),

discussions about population growth and environmental degradation (Betsy Hartmann and the Committee on Women, Population, and the Environment) and the revisionist framework of dependency theory (Catherine V. Scott) are shown to be premised on and permeated with gender and racial stereotypes. Even well-intended scientific and technological projects such as the Human Genome Diversity Project (Jenny Reardon) and bioprospecting co-operations (Cori Hayden) designed to involve and compensate indigenous people run danger of getting caught up in the net of contested racial categories and implicit colonial relationships of knowledge and power.

The fourth section entitled 'Moving Forward: Possible Pathways', finally, offers various suggestions of how to modify conceptual frameworks, theories, policies and practices in order to account for a postcolonial geography of science and technology. While Muslim scholars have devised several ways of conceptualizing a genuinely 'Islamic science' (Ziauddin Sardar), Susantha Goonatilake argues that "completely totalizing changes are no longer possible in science." (p. 386) Several authors agree that for science and technology to contribute to more justice in a postcolonial world, a moral framework aiming at equity is needed. In their view adequate changes can be effected by calling on academics and scientists to work towards a "reciprocal valorisation of knowledge systems" (Catherine A. Odora Hoppers, p. 393), by an "epistemic modernization" of the agendas, concepts and methods of scientific research through marginalized social groups (David J. Hess), by the participation of civil society in scientific research (Karin Bäckstrand) or by consciously adjusting the organizational and institutional structures of Western science (Daniel Sarewitz).

The anthology lives up to its aspirations of providing an accessible compass to issues and questions that have been approached with a "postcolonial sensibility",³ while explicit references to the 'postcolonial' remain largely absent in the featured essays. By highlighting cross-connections between contributions of different sections, Harding succeeds in bringing the texts of diverse disciplinary backgrounds into conversation with each other and thus underscores the postcolonialist need for a trans-disciplinary cooperation. The subjects of indigenous botanical knowledge and medical bioprospecting for example are analysed from the point of view of colonial history, eco-linguistics, conservation management as well as knowledge management. Few essays however seem to engage with the question of how to conceptualize and define 'science' in a postcolonial framework, and also the introduction remains silent in this regard. Yet in the light of Harding's project to concoct a 'postcolonial science theory', dealing with the possibilities and implications of a redefinition of science seems to be an important point.

As the editor herself concedes, a survey of such a broad field can never be close to complete. Nevertheless, the inclusion of some recent historical work (being most familiar with the historical literature, the present reviewer's comments will be restricted to the first section) undermining the conception of bounded, internally homogeneous scientific traditions could have rendered the volume slightly more comprehensive. Stressing the role of processes of negotiation and accommodation—albeit under asymmetrical power relations—Kapil Raj for example has studied the impact of intercultural encounters in South Asia on 'European' science.⁴ He aspires to show that South Asian agents not only contributed bits and pieces of 'raw' local knowledge but were crucial to the development of Western sciences. On the other hand, Projit Bihari Mukharji's study of an Indian version of Western allopathy (*daktari* medicine) analyses the acquisition, adoption and partial

³ Warwick Anderson (2009), here p. 390.

⁴ Kapil Raj (2007).

reinterpretation of Western medicine by Indian practitioners within a unique knowledge system combining different medical traditions, which was at least in part connected to the subversive movement for national independence.⁵ Both examples in a way ‘provincialize’ and ‘hybridize’ Western science by showing that it was partly made outside of Europe and also selectively adapted within non- and anti-European ideologies. Such a perspective might help to avoid an essentialist representation of ‘other cultures’. The authors’ elaboration upon the active role of non-Western agents can thus enrich the conceptual scope of possible ‘counterhistories’ as well as further enlarge the ‘world of sciences’ that figures so prominently in Harding’s postcolonial science theory.

Overall however, the book is a stimulating and rewarding collection for students of the social sciences and philosophy interested in revisionist approaches towards science and technology in a postcolonial world. At the same time, it appeals to science students eager to reflect on the entanglement of science and technology with past and present global world orders. The selection and arrangement of the texts prompt the reader to ponder on how the development of new epistemologies for Western science could benefit from the engagement with various knowledge traditions and gauge the potential of science and technology for contributing to improved social justice on a global scale. If we heed Sandra Harding’s appeal that “science must also change to prepare citizens and experts for working in these transformed environments” (p. 370), encouraging prospective scientists to contemplate these issues might be a first step.

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⁵ Projit Bihari Mukharji (2011).