# ‘We Looked for Scientists…’

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DIALOGUE
Science, Scientists, and Society

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At first glance, “Nanoscale: Society’s Deep impact on Science, Technology and Innovation in India” is a set of accounts about practising Nanoscience and Technology (NS&T) research in a deeply complex, difference-ridden society, rife with paradox and constraint as much as opportunity and innovation. Through wide-ranging and greatly involved ethnographic research, Pankaj Sekhsaria takes us into the heart of the materiality and everyday conditions that constitute the history and practice of NS&T and its applications in India. At second glance, this is an original contribution to Science and Technology Studies (STS) written, however with a light hand, to be of interest to the general reader with curiosity and special interests. But most of all, this is a book demonstrating the stakes when working from the vantage point of theories that argue for the deeply social nature of technology. Through research and engagements spanning a decade, Sekhsaria brings to us four sets of stories that make a compelling case for locating NS&T not only within the everyday practices, and/or the cultural and political locations of scientific research but indeed for the specific and complex cultures of science and scientists in India.

The book sets the stage in good ethnographic fashion through the elucidation of a seeming paradox. It draws on the author’s meeting with a clinician-scientist who must also locate his interventions, in the manner of an activist, *vis-a-vis* how nanotechnology refracts with existing gender relations in the country. Dr. M. Javed Ali, an eye cancer specialist at L V Prasad Eye Institute, Hyderabad relates to Sekhsaria the stakes in using nanotechnology for the treatment of retinoblastoma, a cancer of the eye in small children. When Dr. Ali tells the author that “With nano, those eyes [can be] saved” (2), he means that the treatment will still lead to vision being lost without, however, the loss of the appearance of the eye, thus allowing children, especially girl children, to continue to seem to have both eyes intact. This would positively affect not just their perception in society, but in many cases, their very life chances. At this moment, the researcher and scientists, Dr. Ali appears to the author also as activist, leading him to wonder as to the “dominant current-day narrative of innovation as patenting, commercializing and producing useful and monetizable technology”(3). In this, the laboratory

appears as an "encultured" (4) space. The introductory section also offers a short but incisive review of nanotechnology and its promises; the argumentative focus is on setting the stage in relation to the rhetoric and the promises of nanotechnology as against its contributions. Sekhsaria etches a fine picture of the discursive and material tools mobilized in India so that the country capitalizes upon the potential offered by NS&T for the country to catch up with the rest of the world.

The author's interest, however, in keeping with his opening story, is in asking about the relations, life-worlds, backstage mechanics, conversations, and sensory lives of the laboratories that are called upon to fulfill these promises. He offers us four stories as vignettes.

The STS tradition of laboratory ethnography enjoys a fairly recent provenance; *Nanoscale* in this regard continues this tradition dating to the 1970s combining the concerns of 'first generation' STS ethnography (Hess D 2001)— focusing on interpretive flexibility, contingency of decision making, and social factors broadly affecting claims of scientific consistency—with 'second-generation' work focusing on field-sites beyond the physical space of the laboratory. Across four chapters, we see the author's imaginative and enormously sensitive and detail-oriented attention to questions of great import to STS.

In 'A Microscope by Jugaad', he examines the seemingly Indian quality of the idea and rhetoric of 'jugaad' in the early fashioning of the Scanning Tunneling Microscope (STM) in India, an instrument universally acknowledged to have spawned the field of nanoscience and technology. Enormously important in this chapter, is the detailed focus on material objects in the laboratory; in one sentence, Sekhsaria lists, "pliers, screwdrivers, nuts, bolts, small boxes of plastic and aluminum, double-sided tape, glue sticks, scraps of paper, sheets of paper, files, books, pens, pencils, circuit boards, streams of wires…"(21-22). I bring attention to this section to note how *Nanoscale,* in a classic anthropological fashion, also takes on the task of rendering a seemingly remote object —the laboratory—mundane, relatable, and composed of acts drawing upon the everyday. While, Sekhsaria aptly quotes the work of Latour and Traweek in looking at how the scientific enterprise produces order, meaning and knowledge (25), I am reminded in this section instead, of scientists as Lévi-Strauss' bricoleur (Lévi-Strauss 1966)—an artist as much as a technician, working and improvising with the materials at hand. In the chapter, the author is suitably critical of both greatly optimistic as much as dismissive accounts of *jugaad*, as lacking "conceptual and empirical rigour" (37). Instead, he calls our attention to the practices of *jugaad* as existent no doubt, but also dependent upon an invocation of many different "ways of knowing or knowledge systems" (44). The chapter ends with Sekhsaria asking a parallel but related question on how the development of instruments features within the value systems that privilege research of only particular kinds. In one sense, the question here is about whether 'jugaad', despite its populist appeal, can be recognized and valued in its contribution to recognizable and respectable research and the need for its inculcation into both pedagogy and systems of legibility.

In Chapter 3, "Ancient Ayurveda, New Nanotechnology", the author examines the work of The Centre for Nanobioscience (CNB) and stages a meeting between the multiple knowledge systems, and more specifically between Ayurveda/traditional practices and modern science.

This is also the most ethnographic section of the book with Sekhsaria drawing the reader's attention to the diversity of this laboratory, both in terms of its research engagements as well as the small-town backgrounds of its researchers, who all arrived at CNB through different routes and with differently located desires. There is a hidden story of social mobility here that could have been elaborated to the benefit of the chapter. The author also spends time to speak about the holistic rendering of Ayurveda as a knowledge system in contrast to what he terms as "reductive modern biomedicine" (79) and asks if it is even possible to bring these two worlds together. He ends up by side-stepping the question to argue instead for a culture of innovation that needs the simultaneous presence and encountering between different life- and knowledge- worlds.

Chapter 4, 'Water Purification with the Nanosilver Edge' describes yet another encounter, but this time, between the scientist and the market, or rather the efforts at innovation and their inability to translate into positive consumer behavior. It examines the work of The International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) in Hyderabad and its development of an affordable water filtration device. The central question of the chapter is about why this innovation, which brings together otherwise elusive elements like high-tech research, government support, low cost, and capable of catering to the very urgent problem of clean water access should have failed. Sekhsaria pursues this question out of the laboratory and into the physical environment of the marketplace trying to understand why seemingly cutting-edge technology for the scientist might find itself obsolete within market situations.

Chapter 5, 'Nanotechnology for the Treatment of Retinoblastoma' returns to the question posed at the beginning of the book, the existence of the "clinician-scientist social activist" (117) and ends with focusing on the figure of the "intractable patient" (121) who does not obey the doctor or follow medical advice. At stake is an already depleting gender ratio, further accounts of violence upon the bodies of girl children, and therefore the very life-chances of female infants diagnosed with retinoblastoma. *Nanoscale* concludes with many open-ended questions on the fate of instruments put together through blood, sweat and *jugaad*, as much as the fates of the promise of clean water or the lives of girl children.

The strength of *Nanoscale* lies in its consistent focus on the question of innovation and its empathetic vantage point. Sekhsaria is both an outsider and an insider with relentless curiosity who offers us detailed insights into the laboratories he inhabits. I did read this book with the sense, however, that within this book are contained four other books. What would it look like, I wondered, to investigate nanotechnology from the point of view of the doctor as the savior? What did it mean to have developed instruments willy-nilly with refrigerator shells and Gillette blades alike only to have them unceremoniously dumped at the end of one's career for precious laboratory space? What does it mean to be a scientist in a country of infants beset with cancer of the eye, and people without water? It is to the credit of this book that it opens itself up to further meditations that I hope Sekhsaria will continue to investigate. In *Nanoscale*, Pankaj Sekhsaria has offered a thoroughly researched, crisply written and fantastically interesting set of stories for scholars of STS; of course, but also for scholar and layperson alike interested in the intersections of science, nation-state, postcoloniality, and

gender. The thought I was left with at the end of reading this wonderful book could perhaps be best stated by mangling Max Frisch's oft-quoted sentiment—we look for scientists but find human beings instead.

# References

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