A Carnival for Science: Essays on Science, Technology and Development. Shiv Visvanathan. Oxford University Press, 66, Janpath, New Delhi 110 001. 1997. 249 pp. Rs 395.

Suppose, imaginary reader, you picked up this collection of essays on science, technology and development and started by reading the last two essays. You could, with adequate reason, conclude that these were the *Collected Short Stories of Shiv Visvanathan* (hereafter SV) and other short stories. Furthermore, if as a sensitive scientist, you weren't irritated and enraged, you would be confirming the point SV is trying to make. And if your response was dismissive – this is the work of another of those sociologists who doesn't understand science,' – you would still be confirming SV's reconstruction of the ethic, or the lack of it, of science. Such is the rhetorical cunning of the book. Anyway, which way, but lose. There are three ways, amongst others, of reading this book: as gospel, by those predisposed to the romantic critique of science; as blasphemy, by those predisposed to an unqualified acceptance of both progress and positivist science – both of which would impute much more than the author himself does to his work; or with a notion of 'playfulness' that SV employs in shadow boxing with a hegemonic science. In doing so, you could engage with some of the very urgent issues that his book attempts to raise, and SV does so as a critical scholar, without being swept away by his proposals or his rhetoric. We haven't hopefully forgotten the ideal of the scientific temper, of critical rationalism *a la* Popper, of science being able to reflexively respond to its critics without being erased off the map of history.

This book is a collection of essays that initially began appearing in the 1980s in journals read largely by professionals in development studies, sociology of science and the like. These essays bear the political impress of the period in which they were first published: be it the disenchantment with modernity, the Bhopal Gas tragedy of 1984, the ecological movement, the struggle relating to intellectual property rights and GATT conditionalities, the biodiversity convention and the Rio conference, issues relating to gene patenting, the Mandal agitation, the rise of Hindutva, the cold war, the star wars program. But they do not figure in the volume in the sequence in which they were first published. I remember, first listening to an earlier version of the *Annals of the Laboratory State* as far back as 1985. SV appears to have traversed some distance from there to the object called 'science' he addresses in 'House of Bamboo', and 'Reinventing Gandhi'. The reasons for this shift could well be ascribed in conventional manner to external factors and the inevitable march of history. For example, with the end of the Cold War, socialism isn't denounced as frequently by this neo-Gandhian as it was during the years of the Cold War; though SV cannot resist having a pot-shot for those still predisposed towards socialist politics. Political disagreements apart, SV presumes the existence of institutional and cognitive bonds between the realm of politics and that of the sciences, but the nature of these is not always made explicit.

If Vannevar Bush's *Science the Endless Frontier* epitomized the optimism of science in the post World War II years and its vision was to be translated into science policy instruments incorporated in the development programs of modern nation states, the pendulum began to swing the other way in the 1970s. By this time the idea of development and a frame of industrialization that had delivered, but not in the manner envisaged, came in for questioning. At the same time, within science studies, the old vision of science as entity that was culturally transcendent, value free and neutral began to come undone. There isn't enough space to map a genealogy for the diversity of concerns and frameworks of sociologists of science in India in a brief review. However, it is within the critique of modernity and development that SV's book must be located. This critique of modernity, the modern nation state and development is then extended to modern science, conceived as the most resolute source of legitimacy in contemporary society.

It would be an interesting exercise to read the essays in *The Carnival for Science* along lines similar to those adopted by SV in rereading the five poignant books of the Austrian journalist, Robert Jungk as he trails the trajectory towards The Atom Staat. In fact, the essay on 'Atomic Physics: the Career of an Imagination' is amongst the most meticulously argued of the essays in the volume. SV highlights four strategies identified by Jungk 'to combat the hegemony of the atom staat'. It can be argued that each of these strategies emerges as a framework for one of the essays appearing in the volume: (1) adopting dissenting scientists as prisoners of conscience: Vavilov, the theosophists' critique of modern medicine, Geddes, Srinivasamurthi, Seshadri, (2) of a creative science deconstructing the hegemony of the modern state: annals of the laboratory state, the house of bamboo, (3) every man must become his own scientist: Gandhi, (4) scientists must come together in the search for alternatives: the house of bamboo. However, each of these themes and concerns recur and resurface in most of the essays. They are thus the outcome of a research program that explores an alternate ethic for the sciences and are founded on the premise that contemporary science replicates the violence implicit in the program of modernity and modernization. But we might ask, as to why this search for an alternate ethic, in each of the essays, leads the author back to the numinous, or some divine cosmos. Is the realm of the divine the primal source of an ethic for contemporary society?

There are nevertheless differences between the earlier essays and the later ones, both in the form of argumentation and the problematization of the science–society relationship. The paper on atomic physics and the one on the annals of the laboratory state presents a civilizational critique of modern science, as the incubus of the hegemonic west. In the critique of science that SV proposes, the diversity of scientific practices is reduced to science considered as a vivisectional enterprise, and seeks to disentangle an alternate genealogy from two notorious adherents of anti-vivisectionism: the two Adolfs, Eichmann and Hitler. If anti-vivisectionism is to be the Holy Grail of the alternate conception of science, then these renowned tyrants must be transferred to another register: the allegedly bureaucratic indifference of the scien-

tism. Furthermore, even in terms of argumentation, vivid, seductive analogies and similes are ostentatiously offered as convincing explanations. The potency of the analogies seeks to neutralize any possible rebuttal by contrary historical evidence. Consequently, we are to suppose that the counter-claims made by the author are themselves self-evident: a very conventional historian of science colleague referred to this form of presentation as premised on the 'use of the affirmative assertion'. In fact, we have here a key disagreement between what traditional historians of ideas consider an adequate account, that is at variance with some of those adopting a sociological approach to history. Experts will continue to passionately disagree with this form of argumentation, and not without reason.

However, for those predisposed to the critique of modernity, SV's argument would present itself as apodeictic. The malediction is less fervent in the later articles, where SV attempts to grapple with how an ecological science could be assembled as distinct from the science of ecology, of the different senses of the diversity of nature and the destruction of this diversity. The purport is to restore alternate theorizations about nature and bring them into the realm of the engagement of scientists. This requires reckoning with the 'nitty gritty' of science. And that requires a critical and disciplinary engagement of a different order, which is what makes the essay on Vavilov particularly interesting.

As pointed out earlier, contemporary political events and scientific controversies of the last three decades are reflected in each of the essays: it would not be extending a point too far in suggesting that some of these events promoted these very essays. The stamp of the last two decades is evident. New directions in the social studies of science in India were generated by grass roots movements during the 1970s and 1980s. Those who either participated or led these movements were 'India's dissenting academics of the eighties and nineties', who had figured out that the politics of knowledge were linked with democratic politics. SV traces his genealogy to those dissenting academics who felt that 'India was a theater for a critique of the West'. This critique counterposes the West's expert knowledge to Indian folk wisdom, but not the West's (however the West maybe constructed) folk wisdom to the Indian high church traditions.

The reader is left to navigate between two myths: the one produced by scientists believing in value transcendent and neutral science that exculpates scientists of any responsibility of the knowledge produced. The other is of scientific autonomy, wherein there is 'allegedly' an autonomous logic of science that is working towards the ineluctable goal of removing man from his sacred place in nature. In problematizing science within the critique of development SV conceives science as transcendent and thus philosophically, and hence it appears more demonic than it actually is; but when he comes down to specifying alternative schemes or ethics for science, his reading becomes more social determinist: social forces and interests embodied in other conceptual frameworks come to the fore.

This ambivalence makes it difficult to label this work as one in anti-science. For SV appears to suggest that science is not an independent, unique, truth-making strategy. In that sense, this is possibly a work in reformist critique, and as Julia Loughlin and Sal Restivo write, reformist critique seeks to amend the social grounds which produce error and lacunae in knowledge, but do not challenge the grounds for 'truth making' itself. The book is not written for a popular audience, although the style is quite literary, but for professional social scientists, though there is much in it for the student of the history of sciences. The readership of this journal would possibly find this book exasperating, its value nevertheless resides in the issues and questions posed. This would require engaging with the nested concerns of civilizations, knowledge(s) and ethics. The encounter between different knowledge systems founded on different ethical and epistemic precepts might actually produce a carnival for science, a carnival that this self-professed science basher would, I suspect, secretly welcome.

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Flying Buttresses, Entropy and O-Rings, The World of an Engineer. James L. Adams. Universities Press, 3-5-819 Hyderguda, Hyderabad 500 029, India. 1997. 264 pp. Price: Rs 190.

There is a certain paradoxical nature to how engineering and engineers are perceived in society. On the one hand most people are interested in and impressed by the glamorous end products of successful engineering: the Space Shuttle, the Voyager spacecraft, the Web, the latest Ferrari, etc. They are even interested in and horrified by glaring engineering failures like the *Challenger* and Chernobyl. But when it comes to engineers and engineering as a profession... well, doesn't one get the impression that most people consider them somewhat uninteresting? James L. Adams, the author of the book under review mentions that his wife responded to his first draft with 'The writing is OK, but I don't want to know about engineering'. As an engineer, I can think of a number of reasons for this situation. Most engineering work does involve, as does most scientific work, a lot of routine, uninteresting and hard but necessary work. Secondly, the nature of the enterprise is such that usually it involves team work and incremental improvements rather than spectacular invention. And thirdly, perhaps because caution and meticulousness are so essential to the profession, engineers are generally not very articulate about their work and are conservative in their behaviour. So there is an image problem. The book by James Adams, subtitled *The World of an Engineer*, attempts, rather successfully, in my opinion, to explain to a lay audience what makes engineers tick and what makes engineering such an exciting, important and diverse endeavour.

One of the merits of the book is its wide scope. The fact is that many factors come to bear on engineering as a discipline. A layman would imagine innovative engineering design to be the main concern and he would be partially right. But what the book shows is that development, testing, research, manufacture and assembly, and economics and management, all play important roles. More recently, Adams shows, with examples, that environmental safety and regulatory issues have begun