Science in Question

A review-article by Vinay Lal

Baber, Zaheer. *The Science of Empire*: *Scientific Knowledge, Civilization, and Colonial Rule in India*. Delhi: Oxford University Press, 1998; New York: State University of New York Press, 1996. 298 pp.

Viswanathan, Shiv. *A Carnival for Science*: *Essays on Science, Technology and Development*. Delhi: Oxford University Press, 1997. 249 pp.

Nearly four years after Alan Sokal revealed the hoax that he had played upon the journal *Social Text* by publishing incognito a critique of "science" that was nothing more than, in his own estimation, a nonsensical arrangements of quotations, fragments, and snippets of wisdom from the writings of post-modernists, critics of science, and constructivists who have made it big in the French, American, and British academies, the battle for science is heating up. Constructivism, put simply, is the view that there are no "scientific facts" as such, since these too are socially constructed, and that the social and cultural milieu determines what passes for "science" and "scientific" truth; and speaking politically, some constructivists point to the manner in which modern science acquired its hegemony, and the various oppressions it unleashed in its march to ascendancy. In their haste to agree with Sokal, at least some of his admirers, who are animated by a disdain for post-modernism, hyper-constructivism, and what are sometimes referred to as the "French diseases" (deconstruction and Lacanian psychoanalysis, among others), appear to have overlooked the fact that they would have little to share with Sokal's own declared enthusiasm for Marxism. Sokal has written recently in the *Economic and Political Weekly* that he felt it important to defend "truth, reason and objectivity" against those who voice "extreme epistemological skepticism", and described his position thus: "Unfortunately, some people, starting from the undoubted fact that it's difficult to determine truth – especially in the social sciences – have leapt to the conclusion that there is no objective truth at all. . . . It's crucial to distinguish between the concept of 'truth' and the concept of 'claim to truth'; if we don't do that, we give away the game before it starts."[1] Those who are jubilant at Sokal's tomfoolery and supposed unmasking of post-modernist absurdities would agree with him thus far; but when he adds that for "those of us on the left" the retention of "truth, reason and objectivity" are all the more important if the Marxist "critique" is to have any force, one wonders if they would partake in his agenda.

More than any other political ideology, Marxism has been unable even to question its commitment to modernity, of which the center-plank is scientific progress; and though the left has no more favorite word of abuse than "romantic" to describe those critics of science who have pointed to the intrinsically violent nature of modern science, and the pluralist world of pre-modern science, it is oblivious to its own long-standing romance with science. There is invariably a quote in left writings on science from the later Marx to show that though the great man himself had moved to an awareness of the violent wrought by colonial models of science and development, there is no reason to suppose that one should be critical of the endeavor of modern science as such; indeed, Marx's theory of history would be nowhere without this commitment, verging on a superstition which makes traditional systems of religious belief look positively tolerant. That fascination with big science, the catastrophic results of which are to be seen not only in the havoc caused in the Soviet Union of Stalin and Krushchev and Mao's China, but everywhere in the Third World where large dams were built with little thought given to the effects of displacement upon poor people, has hardly diminished among avowedly Marxist thinkers; but now the tack is to argue, as Meera Nanda has done over the last few years, that post-modern arguments play into the hands of the powerful. A "scenario where truth and reality are made internal to the social context will leave both science and society impoverished," Nanda has written, "and the worst victims will be precisely those who constructivists want to stand up for: the dominated groups, people on the margins, especially those of the third world, who need

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[1] Alan Sokal, "Truth, Reason, Objectivity and the Left", *Economic and Political Weekly* (18 April 1998), pp. 913-4.

the findings of modern science to question some of [the] inegalitarian ideas of their own cultures."[2] However, her critique, and that of Sokal, renders all constructivists into post-modernists, which is absurd; moreover, it is entirely possible to critique post-modernism, and even describe it as the latest incarnation of imperialism, without falling into Marxist orthodoxies.[3]

Baber's book represents, or so the author thinks, one kind of intervention in the debate over constructivist accounts of science. As a rule, which is seldom observed, particularly in the United States where the careers of young academics are held hostage to the 'tenure book', doctoral dissertations should rarely be published, and Baber's study suggests why dissertations do not ordinarily make for good books. Baber begins with a very brief discussion (pp. 2-7) of some of the positions commonly found in the debates surrounding the sociology of scientific knowledge, and describes his own study as informed by the "moderate constructionism" of Stephen Yearley and the "critical realism" of Roy Bhaskar (p. 6). The recourse to a middle ground -- that is, the rejection of ontological idealism, or the adoption of a view that science and technology and are not merely social constructions, and that there is a 'natural' world out there about which there are some irreducible facts – is common in such situations, and obviates the need for much critical thinking. Moreover, sociological theory in Baber's book is merely window-dressing, since these sociologists who appear in the first few pages make no further appearance, and Baber goes on to write a rather straightforward thesis about the history of science in India. Indeed, the subtitle of the work, which suggests a sharp focus on science in colonial India, is quite misleading, since the first half of the book furnishes an account of science in ancient and medieval times, and is followed by an altogether unnecessary and rambling chapter on the origins of British rule in India. This account of Indian accomplishments is intended to convey the impression, about which scholars are mainly in agreement, that achievements in agriculture, irrigation, astronomy, trigonometry, algebra, medical practices, manufacture of textiles and cotton technology, metallurgy, mining, the production of steel, military technology, rocket technology, and immunology were very considerable (pp. 14-42, 54-95, esp. 95), and that science is not inherently a "Western" intellectual practice. This last remark suggests the real sub-text of Baber's work, and the intent of his entry into the debate over constructivism, for the brunt of his criticism is leveled at South Asian scholars, such as Ashis Nandy, Claude Alvares, Susantha Goonatilake, and Vandana Shiva, who are seen as offering an idealized view of a pre-colonial, hermetically sealed society where "traditional" science and technology existed in "perfect ecological harmony" before colonial science rudely shattered India's traditional ways life and its knowledge systems (pp. 9-10, 94-5, 251-54). Baber argues that these scholars mistakenly depict India as the passive recipient of Western science, and indeed that there is no such thing as "Western" science, or Indian, Islamic, or Chinese science; science is science, though histories of science do differ. Indians can be just as much 'scientific' as anyone else, and Nandy and company are captive to "romantic" views of pre-colonial India, and stifled in their thinking by a "simplistic tradition-modernity dichotomy" (p. 251).

Unfortunately, Baber substitutes mere assertions for a critique, and his strategy is to describe repeatedly the views of others as "simplistic" and his own views as "complex", "rigorous", and even "incisive" (pp. 9-10, 94-5, 251-53, 255 n. 21). He mistakes the criticism of modern, vivisectionist science, located in the world-view associated with Bacon, Newton, and Locke, for a critique of science *per se*, and seems unaware of Nandy's position that "criticism of modern science is not criticism of all science."[4] Nandy, Ziauddin Sardar, and Vandana Shiva have argued that the pre-modern world was more hospitable to a plurality of sciences, and nowhere is the intolerance of modern science better witnessed than in its refusal to countenance any critique that does not emanate from within science. Within technology, this view appears as technicism, namely that any shortcomings in technology can be overcome by better or different applications of technology. Nandy does not grant that there is any distinction between science and technology, for this very distinction becomes the ground for deflecting all social criticism of science away

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[2] Meera Nanda, "Restoring the Real: Rethinking Social Constructivist Theories of Science", in *Socialist Register*, ed. Leo Panitch (New York: Monthly Review Press, 1997), p. 316; also see her articles, "Reclaiming Modern Science for Third World Progressive Social Movements", *Economic and Political Weekly* (18 April 1998):915-22, and "Is Modern Science a Western, Patriarchal Myth? A Critique of Populist Orthodoxy", *South Asia Bulletin* 11 (1991):110-16.

[3] See, for example, Ziauddin Sardar, *Postmodernism and the Other* (London: Pluto Press, 1997).

[4] Ashis Nandy, "Science for the Unafraid", *Mainstream* (26 June 1982), p. 17.

from science toward technology. Accordingly, Nandy describes himself as being concerned "with the frame of criticism, not with criticism alone",[5] but all these nuances are simply lost on Baber. Nor does he take on the work of the PPST (Patriotic and People-Oriented Science and Technology) group, which in its early years was comprised of scientists and engineers, and which is perhaps most clearly associated with the views that Baber deprecates.

Had Baber anything to show for his self-proclaimed "rigorous" analysis (p. 9), the glaring deficiencies in his understanding of the South Asian critics of modern science might have been overlooked. Instead, we are offered a 20-page analysis, when one paragraph would have sufficed, of debates on education leading to the Anglicist-Orientalist controversy and Macaulay's infamous "Minute on Education" (1835), ostensibly in order to establish the place of scientific education in colonial India. Remarkably, the author himself does not appear to know what his book is about, nor does Baber's discussion add an iota to what is already common knowledge of well-worn themes. The book has a good deal to say, largely through quotations, about what colonial officials thought of science, but the politics of colonial science escapes Baber. We are informed that there was an indigenous system of inoculation against smallpox, but the real question is whether smallpox could mean, as Frederique Marglin has written, something quite different in colonial and indigenous systems of knowledge.[6] Similarly, the discussion on the mathematical genius Ramanujan, who confounded Godfrey Hardy and the Cambridge mathematicians with the observation that all his solutions were inspired by the goddess Namgiri, could have been made the grounds for some argument about culturalist readings of science, but Baber is content to offer capsule descriptions (pp. 234-35). Every now and then Baber seems to stumble on to something interesting, such as Madan Mohan Malaviya's dissent from the report of the Indian Industrial Commission, where he disputed the assumption that Europeans were inherently more fitted for scientific enterprises than Indians, or that they themselves were to blame for the decline of indigenous industries, but this discussion is also left hanging in the air (pp. 222-24). Indeed, for Baber's purposes, he might well emulate the more subtle critique, which is not without its problems, that Gyan Prakash has offered in his recent piece, "Science between the Lines", where he deploys Homi Bhabha's idea of 'hybridity' to suggest that science was hybridized in its very reception in the colonies. The colonials did not merely adapt to science, they effected a translation; and thus the colonizer found that science could not seek domination through mere imposition. Hindu yogis and Muslim fakirs made of science what they could, and one Father Lamont found, to his horror, an Indian lawyer responding with enthusiasm to his lecture on heat, electricity, and magnetism by calling for the abolition of the distinction between the organic and the inorganic, and urging the unity of phosphorous and human thought.[7]

Shiv Viswanathan's *A Carnival for Science*, on the other hand, suggests why its author is one of India's most creative and thoughtful writers, and one of the very few in whose writings the ludic element is allowed a free hand. A collection of previously published articles, Viswanathan's book steers clear of any explicit engagement with the sterile debate on constructivism in science studies, though he offers a devastating critique of the fanatical world-view of modern science. There is a poignancy in his reflections, as he looks at how a disenchantment set in with those magical words – "nation, science, secularism, development, reason, progress" – that resounded in his childhood. The "future belongs to those who made friends with science", Nehru had declared, and later Atma Ram, who served as chairman of the National Committee on Science and Technology, confessed: "We really believed that Nobels in science went hand in glove with rise in GNP" (quoted pp. 4-5).[8] The nation became transformed into the nation-state, and

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[5] Ashis Nandy, "Alternative Science Movement: A Reply to Ram Guha", *Lokayan Bulletin* 6, no. 6 (1988), p. 64.

[6] Frederique Apffel-Marglin, "Smallpox in Two Systems of Knowledge", in *Dominating Knowledge: Development, Culture and Resistance*, eds. Frederique Apffel-Marglin and Stephen Marglin (Oxford: Clarendon Press, 1990), pp. 102-44.

[7] Gyan Prakash, "Science between the Lines", in *Subaltern Studies IX: Writings on South Asian History and Society*, eds. Shahid Amin and Dipesh Chakrabarty (Delhi: Oxford UP, 1996), pp. 171, 179-80.

[8] The tendency to equate Nobel Prizes, or other supposed indices of stellar achievement, with national greatness is common to nearly all classes of modern Indians, even those who pride themselves on being radical. V. T. Rajshekhar, the editor of *Dalit Voice*, a journal given to making mince-meat of Brahmin pretensions, has recently stated that the inability of Indians to win any Nobel prizes in the post-independent period (this is before the economics prize went to Amartya Sen, and Chandrasekhar had long been a NRI),

from thence into the national security state, the origin of many new oppressions; as for science, harnessed in the service of "development", which put a new spin on what it means to be *untouchable* in Indian society, it casually set aside various disasters with the argument that better science and better management would alleviate similar problems in the future. Viswanathan notes, in a chilling reminder of the importance that the national security state attaches to science, that the first protestors against the Narmada project were arrested under the Defence of India rules (p. 11). Generally, Nehru, seen by the left as a charming, urbane, well-meaning, staunchly secularist, and progressive (if bourgeois) statesman, is spared harsh criticism; but Viswanathan registers the dissenting view that "his was only a liberal variant of the Leninist equation that Soviets + electricity=Communism", which under Stalinism became transformed into: "Soviets + electricity = genocide." (p. 11)

The essays that comprise Viswanathan's book are on sufficiently diverse subjects that it might be more profitable to hint at some of the more arresting aspects of his work. The logic of development represents the "contemporary rituals of the laboratory state", which is composed of "four theses": "the Hobbesian project", or a conception of society in which science reigns supreme; "the imperatives of progress", which permit and legitimize social engineering on all those subjects who are viewed as the proper targets of reform, scientific testing, and what the Victorians called 'improvement'; "the vivisectional mandate", where pain is inflicted upon the Other in the name of science; and "the idea of triage", which condemns some species of human or other living beings to death on the grounds that they are obsolete, a drain on natural resources, and beyond repair (p. 17). These ideas are developed in the subsequent essays: the "vivisectionist mandate", for example, receives fuller treatment in the discussion (co-authored with Nandy) on modern medicine and its non-modern medicine. A contrast is drawn between the plague that struck Bombay in 1896, where Haffkine summarily rejected advice that he institute sanitary measures, and the plague which affected Egypt around the same time, where Sir John Rogers, then director-general of the sanitary department, introduced quarantine, isolating infected people and persons who had come into contact with them, and immediately set into place an entire set of sanitary measures. The plague in Bombay raged for twelve years and killed thousands, while in Egypt the plague was eliminated in six months with a loss of 45 lives: yet Rogers is now a forgotten figure, while Haffkine continues to be lionized as a hero of science (pp. 23, 120-21). Haffkine, who represents the laboratory point of view, was then testing "on man" the vaccine he had developed after experiments on laboratory animals with the cholera bacillus, and he would not tolerate any measures that might render ambiguous the 'purity' of his experiments. In a manner of speaking, this was also an enactment of Hiroshima, about which Viswanathan punctures a number of myths. American scientists were critical in the selection of Hiroshima and Nagasaki as bomb sites; and what is particularly ominous is that Hiroshima, having previously escaped the heavy incendiary bombing inflicted on Tokyo and other cities, was picked not because it was a legitimate military target, but because it represented a virgin field where a true estimate of the damage wrought by the atomic bomb could be obtained. Not only were most of the scientists unrepentant after the bombing, but they "saw in it new possibilities for science"; and of those who demurred, such as Hans Bethe, they were seduced back into the laboratory for further research. Bethe left Los Alamos after the Hiroshima bombing, and was among a group of scientists who declared that Truman's decision to continue research into the H-Bomb was genocidal; and yet, by 1951, Bethe and Oppenheimer were "participating enthusiastically in H-Bomb research." (pp. 30-1, 158-59)

A Carnival for Science bristles with incisive comments and shows a fecund and playful mind at work. Viswanathan probes the inherently diachronic nature of museums (p. 21, 57), and the "polysemic richness of the word 'seed'" is contrasted with the "semantic impoverishment of the word 'gene.'" (p. 56) Viswanathan is not the first to point out the manner in which the narratives of modernity and development violently alter notions of time, so that everywhere clock-time now substitutes for body-time, solar-time, leisure-time, and an array of other notions of time; but the propositions are stated in Viswanathan's own inimitable style, with panache and intelligence: "Modernity was a vision of conquest. Every structure of conquest needs a calendar as a liturgy of its power. To acquire one it has to capture or rewrite time. Time,

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renders hollow claims of upper-caste supremacy. I have commented on the anxieties that the inability of Indians to make it in the big league generates among modern Indians, and their fetish for records and prizes, in my article "Indians and the Guinness Book of Records: The Political and Cultural Contours of a National Obsession", *Suitcase* 1, nos. 1-2 (1995):60-73.

till the advent of modernity, was capable of reversal.” (p. 20) Entire essays can be woven around little gems of real insight, nowhere more so than in the concluding essay, “Reinventing Gandhi”. The Gandhi on offer is a hermeneutic one, who today would have studied science rather than law (p. 217), and would have made of Narmada a great platform for satyagraha (p. 235). What would appear to be an odd comparison is drawn between Gandhi and Rabelais: both were “sociologists of the body”, notes Viswanathan, and he could have added that both were obsessed by flatulence (pp. 226-27). “Rabelais was the chronicler of mimicry, excess, obscenity and the carnivalesque”; Gandhi “thrived on a celebration of limits, of a non-repressive kind”: and yet both indubitably played not merely within, but with, the boundaries that have been placed around our understanding of the body (p. 227). Viswanathan suggests that preeminently Gandhi was a scientist, though that aspect of his thinking has been overlooked; and viewed in relation to Hinduism, Viswanathan comes up with the arresting formulation that Gandhi was a scientist in his approach to Hinduism and a Hindu in his approach to science. Viswanathan, like some of his teachers – Ramu Gandhi, Nandy, Jit Singh Uberoi, Veena Das, and others -- to whom he dedicates the book, is an essayist at heart, and readers must pursue these questions at greater length on their own initiative. So far as the intent of Viswanathan’s book is to render the world of science more plural, to introduce varying and dissenting conceptions of science, and to open up the world of big science to a moral and cognitive space, he succeeds admirably.