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*By David Arnold**

ABSTRACT

This essay uses the seminal figure of Jawaharlal Nehru to interrogate the nature and representation of science in modern India. The problem posed by Nehruvian science—the conflict between (yet simultaneity of) science as both universal phenomenon and local effect—lies at the heart of current debates about what science means for the non-West. The problematic of Nehruvian science can be accessed through Nehru's own speeches and writings, but also through the wider project of science with which he identified—critiquing colonialism, forging India's place in the modern world, marrying intellectual endeavor with practical nation building. The essay makes a case for looking at Nehruvian science as a way of structuring the problem of postcolonial science, particularly in relation to understanding the authority of science and its evaluation in terms of its capacity to deliver socioeconomic change.

THE QUESTION "Where is the postcolonial history of science?" is not easily answered. It entails theoretical issues as to what constitutes the "postcolonial" in science and technology studies but also practical consideration of how such a history can be instantiated. The postcolonial might be located not in the ex-colonies at all but in Western centers of science, in their universalizing ambitions and their ongoing economic, political, and scientific hegemony. It would be rash, too, to homogenize postcolonial diversity. The experience of one ex-colony might differ vastly from that of another—and in ways that reflect varieties of indigeneity as much as separate colonial traditions. And if the postcolonial history of science is to avoid merely celebrating the end of colonialism, it is necessary to ask what the passing of colonialism signified and when, in relation to science, it effectively ended.[1] This essay makes a case for examining Nehruvian science as a way of framing the problem of postcolonial science in relation to what, given India's size, its

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[1] Warwick Anderson, "Postcolonial Technoscience," *Social Studies of Science*, 2002, *32*:643–658, esp. p. 643; and Anderson, "Where Is the Postcolonial History of Medicine?" *Bulletin of the History of Medicine*, 1998, *72*:522–530.

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scientific standing in the modern world, and the extent of its scientific ambitions under colonialism and after, must be a prime candidate for consideration.[2]

A concept of Nehruvian science (NS) has value only if it adds analytical depth, and not mere descriptive gloss, to the understanding of the history of science in modern India and if it allows the historian to stand outside *both* the nationalist representation of science *and* the colonial vision of science that preceded it. There are evident dangers, in focusing exclusively on Jawaharlal Nehru (1889–1964), of exaggerating the contribution of one individual or of shrinking the temporality of postcolonialism to fit the compass of a single life. Nehru was not a practicing scientist, nor (despite his undergraduate education at Cambridge) did he possess scientific training. And yet he was one of the principal architects of modern India and, through his enduring commitment to science, a leading figure in the formation of India's science policy and practice. His personal engagement with science helps explain how, within the time frame of the late colonial and early postcolonial periods, science received such public validation; but equally it helps us to contest negative representations of science in the non-West as a form of stubborn "localism," as a kind of ethnographic aside to the "real" (i.e., Western) history of science.[3] Nehru was one of the principal authors of postcolonial subjectivity, not least in relation to science. Still more than that, the career of Nehru's science raises questions about science as authority and science as delivery that are surely of wider moment.

This essay accordingly seeks to outline a concept of Nehruvian science and to suggest how it might advance ideas of postcolonial science more generally. There are four broad strands to the argument. First, since for Nehru science was also a philosophical and literary pursuit, NS created a space for postcolonial ownership and subjectivity, establishing the centrality of science in the autobiography of the Indian nation. Second, since science stood for authority and a higher form of knowledge, NS sought to contest Western presumptions of a monopoly over science and to ground modern science in India's cultural traditions and contribution to world civilization. Third, while extolling the transnational foundations of modern science, Nehru understood science, intellectually and functionally, primarily in relation to India's national needs and Cold War ambitions. Fourth, NS presented science as a program of delivery, committed to redressing such basic social problems as ill health and poverty, an endeavor answerable to the state and the public it aspired to represent.

THE AUTHORIAL VOICE

Postcolonial studies have been preoccupied with matters of voice. The question of who speaks, whether for the subaltern, the colonized, or the postcolonial subject, is a recurring analytical trope. Significantly, it was as a writer, speechmaker, and politician and, above all, as prime minister of India (1947–1964) that Nehru gave his authorial voice to science in India. Science for Nehru was in part a literary strategy, a means of giving narrative structure and thematic coherence to Indian history. This served a patriotic end—to demonstrate the wealth and antiquity of India's attainments in science, technology, and

[2] In 1961 India had four hundred thousand science and technology degree holders and seventy thousand full-time researchers. Between 1948–1949 and 1959–1960 state expenditure on scientific research in India rose from Rs 10.8 million to Rs 133.7 million. See Arun Kumar Biswas, *Science in India* (Calcutta: Mukhopadhyay, 1969), pp. 120–121.

[3] Regarding "localism" see Jan Golinski, *Making Natural Knowledge: Constructivism and the History of Science*, 2nd ed. (Chicago: Univ. Chicago Press, 2005), pp. xii, 182.

medicine while also critiquing its enduring backwardness and emphasizing the value of its syncretic interaction with other civilizations, including those of the Muslims and the British. This combination of factors valorizing the importance of science in history was evident in his *Glimpses of World History*, first published in 1934–1935, which also announced the strongly didactic trait that would characterize Nehru's writing and speech-making. A belief in the authority of science as the highest form of secular knowledge was invoked in order to instill legitimate pride in indigenous achievement and to laud the contribution ancient and medieval India made to the wider world of science, but Nehru qualified this with recognition that India could not make progress, in the present still more than in the past, from a position of epistemic isolation. Science even gave meaning and context to the colonial experience. Thus he remarked in 1936 in his autobiography: "To the British we must be grateful for one splendid gift of which they were the bearers, the gift of science and its rich offspring." The manner of India's encounter with the West, via colonial rule, was "unfortunate, and yet, perhaps, only a succession of violent shocks could shake us out of our torpor." Without this "great gift," India was "doomed to decay."[4] Nehru could not overlook the authority science had formally enjoyed under colonialism, even while he remained critical of its failure to deliver the practical benefits a backward and impoverished India so patently needed.

Nehru's interest lay as much in the culture of science as in its material achievements, and he repeatedly invoked what he termed the "scientific temper" and the "spirit of science."[5] This philosophical understanding of science appealed to Nehru at several levels. It enabled him to present his own social ideals and political convictions as being grounded in rationality, part of his secular worldview and "scientific" socialism, while condemning his Indian opponents, especially Hindu and Muslim communalists, as woefully unmodern.[6] Science alone ensured that society did not revert to the kind of barbarism that religious bigotry and reactionary obscurantism repeatedly threatened. But, for all his praise of scientists, Nehru did not believe that they held a monopoly on the truth. Rather, they needed the vision of the intellectual and the pragmatism of the politician to give their work wider meaning and purpose. As he put it to India's National Academy of Science in 1938:

> We have vast problems to face and to solve. They will not be solved by the politicians alone, for they may not have the vision or the expert knowledge; they will not be solved by scientists alone, for they will not have the power to do so, or the larger outlook which takes everything into its ken. They can and will be solved by the cooperation of the two for a well-defined and definite social objective.[7]

Cultivating a scientific outlook was part of the educated individual's personal development, but it was also a social cause; it was a public duty, not confined to scientists, to help society to think and act in ways that were rational and progressive. Scientific thought and

[4] Jawaharlal Nehru, *Glimpses of World History* (1934–1935; New Delhi: Penguin, 2004), pp. 175, 200–201, 461, 468; and Nehru, *An Autobiography* (1936; Bombay: Allied Publishers, 1962), pp. 436, 449.

[5] See, e.g., Jawaharlal Nehru, *The Discovery of India* (1946; Delhi: Oxford Univ. Press, 1989), pp. 409, 512, 515.

[6] "I am a socialist because I feel that socialism is a scientific approach to the world's problems," Nehru told students in Calcutta in 1939: Baldev Singh, ed., *Jawaharlal Nehru on Science and Society: A Collection of His Writings and Speeches* (New Delhi: Nehru Memorial Museum and Library, 1988), p. 27.

[7] *Ibid.*, pp. 28–29 (science as guardian against religious bigotry and reactionary obscurantism), 23–24 (quotation).

achievement encouraged constructive dialogue with other fields of speculation and inquiry—from history and philosophy to psychology and psychoanalysis—each of which might challenge scientific orthodoxy or present its own complementary understanding of the world. Even religion, so often represented by Nehru as the antithesis of reason, had the ability to reach beyond "the surface of things" in ways conventional science could not. With their remarkable capacity for abstract thought, Indians had pioneered the study of mathematics, algebra, and astronomy in ancient times; they similarly had the capacity to deploy this intellectualism to help shape modern science. Thus, inspiration might be found in "the old Vedantic conception that everything, whether sentient or insentient, finds a place in the organic whole." The career of the plant physiologist Jagdish Chandra Bose (1858–1937) demonstrated for Nehru how India's philosophical and spiritual traditions could actively inform and supplement the work of modern science.[8] The "culture of science" gave India pride in its past, but also the intellectual authority and resources to be an active and equal participant in the present-day domain of science.

For Nehru science was simultaneously both universal and national, even though intellectually and politically this might be a difficult proposition to maintain. In 1948 he declared: "Science and technology know no frontiers. Nobody talks or ought to talk about English science, French science, American science, Chinese science. Science is something bigger than countries. There ought to be no such thing as Indian science." Perhaps Nehru was not endorsing a concept of "Indian science" because it might imply that India remained locked in an arcane localism, not modern enough to embrace the universality of modern science. He was also convinced that India, still striving to overcome a colonial legacy of neglect, needed foreign scientific and technological expertise and could not otherwise meet the material needs and ideological objectives of the modern nation.[9]

The articulation of science as authorial voice gave individuality (even at times a certain quirkiness) to Nehru's scientific utterances, just as it brought to the postcolonial predicament the authority and the ambiguity of the once-colonial, still part-colonial, subject. Nehru's subjectivity enabled him to personalize science, to render it heroic. For him, there was "something very wonderful about the high achievements of science and modern technology." Scientists were "the miracle-workers of today." But it was also part of his authorial license to speak, in the depths of the Cold War era, from a position of moral superiority, not least vis-à-vis the West, about the danger posed by growing nuclear arsenals and the destructiveness of these "new and terrible weapons."[10] Subjectivity gave Nehru the freedom to communicate his often lofty idealism to a wider Indian and international audience.

[8] Nehru, *Discovery of India* (cit. n. 5), p. 216; Sarvepalli Gopal, ed., *Jawaharlal Nehru: An Anthology* (Delhi: Oxford Univ. Press, 1980), pp. 282–286; and Singh, ed., *Jawaharlal Nehru on Science and Society*, pp. 177–181 (regarding J. C. Bose).

[9] *Jawaharlal Nehru's Speeches*, 4 vols., Vol. 1: *September 1946–May 1949* (New Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1949), p. 590 (quotation); and Robert S. Anderson, *Nucleus and Nation: Scientists, International Networks, and Power in India* (Chicago: Univ. Chicago Press, 2010).

[10] Nehru, *Discovery of India* (cit. n. 5), p. 409; Nehru, *Glimpses of World History* (cit. n. 4), p. 605; and *Jawaharlal Nehru's Speeches*, Vol. 2 (New Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1954), p. 129.

Nehru's was not the only authorial voice. His long years in prison in the 1930s and early 1940s enabled him to read extensively in history, science, philosophy, and current affairs. His writings made extensive reference to the Western scientists, philosophers, and social theorists who influenced his own thinking—including Bertrand Russell (to whom he possibly owed the expression "scientific temper"), J. D. Bernal (especially for his *Social Function of Science*), P. M. S. Blackett (a scientific advisor to Nehru after 1947), and Laurence Hogben (whose *Science for Citizens* he called an "astonishingly good book").[11] These like-minded intellectuals nurtured and reinforced Nehru's belief that science was not only authoritative but had a unique capacity to effect far-reaching socioeconomic change. Given Nehru's propensity for assimilating and rearticulating the views of others, one of the difficulties in seeking to conceptualize Nehruvian science is to establish what Nehru's own contribution actually was. Did he invent the scientific ideas and policies to which he gave voice or merely appropriate them from others? This uncertainty lends strength to the argument that Nehru was both author and publicist, for he brought his own intellect, imagination, and presentational skills to the public consideration of science in India but he was not the sole author when it came to how that science was imagined or drafted into the political process.

There is a further point here. Postcolonial science might be presented as literally that: as sited temporally after colonialism. But India's independence was long anticipated and its science had by the 1930s reached a point of maturity—in institution building, individual achievement, and international recognition—that encouraged high expectations of what would happen once colonial constraints were removed.[12] NS began its "postcolonial" career more than a decade before independence in 1947, just as it continued long after that date to grapple with the legacies of colonial rule and its continuing manifestations.

Histories of modern science in India have been written in which Nehru receives barely a mention or in which he appears as a latecomer to ideas about the social role of science that others had pioneered. The strongest case against Nehru as innovator lies with the career of Meghnad Saha (1893–1956). A professor of physics at Allahabad University, Saha argued for a comprehensive approach to the problems of rural poverty, flood control, and endemic malaria that afflicted his native Bengal. Inspired by Soviet planning and the American New Deal, Saha proposed the massive deployment of state resources to tame Bengal's rivers and, through a series of hydroelectric dams, generate energy for industrial development.[13] Saha expounded his ideas through the journal *Science and Culture*, which he founded in 1935, and the title and contents of that journal express many of the ideas that subsequently became associated with Nehru—the cultural understanding of science, confidence in the strength of India's ancient and modern scientific credentials, the dual perspective on science as both national agenda and universalist pursuit, and the commanding role of the state in national regeneration.

[11] Jairam Ramesh, "Nehru's Scientific Temper Recalled," *Guwahati*, 27 May 2011, www.thehindu.com/. . ./archive/. . ./Jairam_Ramesh_on_Ne_642167n.d., p. 5 of 12; and Baldev Singh, "Introduction: Jawaharlal Nehru and Emergence of His Scientific Approach," in *Jawaharlal Nehru on Science and Society*, ed. Singh (cit. n. 6), p. xix (regarding Hogben's book).

[12] Robert S. Anderson, *Building Scientific Institutions in India: Saha and Bhabha* (Montreal: McGill Univ. Centre for Developing Studies, 1975); and Shiv Visvanathan, *Organizing for Science: The Making of an Industrial Research Laboratory* (Delhi: Oxford Univ. Press, 1985).

[13] Anderson, *Building Scientific Institutions in India*, pp. 24–29; and Visvanathan, *Organizing for Science*, Ch. 4.

But where Saha was a scientist looking to propagate his ideas among politicians, Nehru was a politician seeking to mobilize science and scientists behind his social vision. In the end, Nehru proved more astute and influential, while Saha, by the time of his death, had become marginalized. With or without Saha, the late 1930s were ripe with opportunity. In 1938 Saha impressed his national regeneration scheme on Subhas Chandra Bose, then president of the Indian National Congress, and this outlook was reflected in Bose's speeches at the time.[14] Bose passed responsibility for planning on to Nehru, who, at Saha's suggestion, was installed as chair of the Indian Planning Committee. Armed with subcommittees on such topics as health, manufacturing, and population, the committee drafted a blueprint for India's social and industrial future.[15] However, the outbreak of war in 1939 and the renewed imprisonment of Congress leaders precluded further discussion until after 1945.

It could be argued that Nehru adopted a scientific agenda that was Saha's and Bose's well before it became his own. But such an argument underplays Nehru's contribution—or the extent to which his views and those of others like Saha were, at the time, congruent.[16] Nehru's speeches and writings from 1932 onward make it clear that he was intent on formulating his own views on the role of science in society, including, following Soviet precedent, "the application of the spirit of science to social affairs." As he told the Indian Science Congress in 1937, "science is the spirit of the age and the dominating factor of the modern world . . . the future belongs to science and to those who make friends with science and seek its help for the advancement of society."[17] In looking to Nehru to chair the Planning Committee, Saha was recognizing his stature as a left-leaning nationalist leader and a formidable publicist for science, a combination that gave him a unique ability to carry the message for scientific planning to party and nation. Nehru could popularize the cause of regenerative science in a way Saha could never hope to do.

THE CHARACTER OF NEHRUVIAN SCIENCE

Nehruvian science encompassed many different things, but some of its most salient characteristics deserve to be highlighted here. First, it was a program for sociocultural change, intended to transform society and the prevalent mind-set. Science was crucial to Nehru because he wanted to oversee radical change in India without having recourse to revolutionary violence or state authoritarianism. As he remarked in 1952: "We live in an age of science. We hear and read of revolutions but the greatest revolutionary force in the past 150 years has been science, which has transformed human life and has changed political, social and economic organizations." In postcolonial India the revolutionary effects of science were to be mobilized not, as in Russia, through violent upheaval and Stalinist directives but, instead, through parliamentary democracy and state planning. Without the instruments of dictatorial rule, Nehru was dependent on his ability to foster

[14] *Selected Speeches of Subhas Chandra Bose* (New Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1962), pp. 72–99.

[15] Regarding the Indian Planning Committee blueprint see K. T. Shah, *National Planning Principles and Administration* (Bombay: Vora, 1948); and Nehru, *Discovery of India* (cit. n. 5), pp. 395–402. Significantly, in Visvanathan's *Organizing for Science* (cit. n. 12) Saha is presented as the innovator, while Nehru receives barely a mention.

[16] Singh, "Introduction" (cit. n. 11), pp. xv–xvi.

[17] Nehru, *Glimpses of World History* (cit. n. 4), p. 1006; and *Selected Works of Jawaharlal Nehru*, Vol. 8 (New Delhi: Orient Longman, 1976), p. 806.

support for science by tutoring the democratic will and educating government itself. "My interest," he told the Science Congress in 1951, "largely consists in trying to make the Indian people and even the Government of India conscious of scientific work and the necessity for it." The planning process, interrupted by war, resumed with the formation of a National Planning Commission in 1950. For Nehru, planning was the equivalent of a peaceful revolution and represented "science in action."[18]

The Nehruvian vision of science was intended to replace the imperial ideology of the old colonial services (dedicated to upholding empire) with an ideology of science as the means by which the modern nation could free itself from the incubus of custom and overcome deprivation and backwardness. Nehru declared in 1937: "It was science alone that could solve these problems of hunger and poverty, of insanitation and illiteracy, of superstition and the deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people." Or as he put it, still more emphatically, in 1962: "Poverty has ceased to be inevitable now because of science." Science had the capacity to resolve India's seemingly most intractable problems, including rapid population growth.[19] Although Nehru prioritized "science" in his earlier utterances, as he grew more aware of the complex needs of state planning and rapid industrialization his references to technology became more prominent. Thus in 1956 he spoke of "the stupendous growth of technology" and the need to think "in technological terms" of the requirements of the planning process. Medicine and public health never stood quite so high in Nehru's esteem.[20]

Second, NS was state science—science conducted for the people but at the direction and discretion of the state. There were clear reasons for this. In British India the scientific establishment had largely been a state establishment, situated in specialist research institutes rather than in the more public (and Indian) arena of the universities. Although many former colonial services were dissolved after independence, or restructured to meet national needs, the legacy of state direction and responsibility remained. Under the provisions of the 1935 constitution, carried forward into the Indian constitution in 1952, many areas of government business were assigned to the provinces (and so, latterly, to the states of the Indian Union). Nehru saw the requirements of modern science and technology as being too fundamental, but also too specialist and strategic, to be relegated to the states or poorly funded local universities. Issues of national self-sufficiency and defense also seemed to favor centralized control. One of the clearest statements of this need was made in the "Scientific Policy Resolution" presented by Nehru to the Indian parliament in 1958; but he attached similar importance to state control of major industries, without which no modern nation could "retain its freedom."[21]

[18] *Jawaharlal Nehru's Speeches*, Vol. 2 (cit. n. 10), p. 103; *Jawaharlal Nehru's Speeches*, Vol. 3 (New Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1958), p. 374; and Singh, ed., *Jawaharlal Nehru on Science and Society* (cit. n. 6), p. 146.

[19] *Selected Works of Jawaharlal Nehru*, Vol. 8 (cit. n. 17), p. 807; and Ward Morehouse, "Nehru and Science: The Vision of New India," *Indian Journal of Public Administration*, 1969, *15*:489–508, on p. 497 (1962 statement). Regarding the capacity of science to solve India's most intractable problems see, e.g., Nehru, *Glimpses of World History* (cit. n. 4), p. 12.

[20] *Jawaharlal Nehru's Speeches*, Vol. 3 (cit. n. 18), p. 93. Regarding the lesser emphasis on medicine and public health see *Jawaharlal Nehru's Speeches*, Vol. 2 (cit. n. 10), p. 13; and Singh, ed., *Jawaharlal Nehru on Science and Society* (cit. n. 6), pp. 132, 193.

[21] *Jawaharlal Nehru's Speeches*, Vol. 2, p. 80; and Singh, ed., *Jawaharlal Nehru on Science and Society*, pp. 157–158.

Figure 1. *Nehru speaking on the occasion of the foundation stone–laying ceremony of the Tata Institute of Fundamental Research, Bombay, on 1 January 1954. Seated, from left to right, are Homi Bhabha, Morarji Desai (then Chief Minister of Bombay), J. R. D. Tata, and Shanti Swarup Bhatnagar.*

As prime minister, Nehru used the central government, its scientific institutions, and control over science budgets to build a scientific establishment sympathetic to his views. In August 1947 he created a central government portfolio for scientific research under his own direction. Expanded into a Department of Scientific Research, in 1951 this became the Ministry of Natural Resources and Scientific Research.[22] Nehru continued to lead debates in parliament on scientific matters, address annual meetings of the Indian Science Congress, and preside over the governing body of the Council of Scientific and Industrial Research. Patron and mentor of India's postcolonial science, he established a coterie of like-minded scientists around himself, among them S. S. Bhatnagar, director-general of the Council of Scientific and Industrial Research, P. C. Mahalanobis, the statistician behind India's planning regime, and Homi K. Bhabha, chair of India's Atomic Energy Commission. Nehru retained personal control of the Department of Atomic Energy, and his keen interest in nuclear power as a vital energy source and marker of India's scientific modernity ensured that his relations with Bhabha were particularly close, allowing privileged funding for the atomic energy program.[23] (See Figure 1.)

Third, NS was an institution-building project. As one commentator observed in 1977, Nehru, "more than any other Indian of his time," realized that "the days of scientists working for their own intellectual satisfaction in relative isolation" were over. They had to accept the logic of funding resources controlled by the state and state-driven science

[22] *Scientific Research* (Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1957), p. 4.

[23] Morehouse, "Nehru and Science" (cit. n. 19), pp. 494–496 (on the Ministry of Natural Resources and Scientific Research); and Indira Chowdhury and Ananya Dasgupta, *A Masterful Spirit: Homi K. Bhabha, 1909–1966* (New Delhi: Penguin, 2010), Ch. 7.

policy. Under Nehru, India saw an eightfold increase in the national science budget between 1948–1949 and 1958–1959. His government inherited a set of colonial scientific bodies, such as the Council of Scientific and Industrial Research, and to these, as prime minister, he added others, like the Atomic Energy Commission, which drew on the model of similar institutions in the West. In a speech that anticipated his later reference to hydroelectric dams as "temples of the new age," he spoke in 1954 of India's national laboratories as "temples of science built for the service of our motherland." Although the details of his involvement remain for the present lost in government files and departmental memoranda, evidence suggests that Nehru concerned himself with key appointments to these institutes, just as, near the end of his life, he voiced impatience at their increasing bureaucratization and lack of innovation.[24]

Fourth, NS, while primarily designed to inspire national pride and nurture India's development regime, was also, in an era of intense Cold War rivalry, a way of renegotiating India's former scientific dependence on Britain as the colonial master and of opening relations with other scientific powers—the United States, Russia, France, and Canada. Science, technology, and, to a degree, public health gave ex-colonial India a new authority, a new moral stature, in the world. NS was a significant adjunct to, and vehicle for, the nonaligned movement in which Nehru was so pivotal a figure. It is striking how often he chose to address meetings of the WHO and UNESCO in India, using the opportunity to stress both the international nature of modern scientific endeavor and India's active participation and leadership role within it.[25]

Finally, NS was a historiographic project. Beginning with, or drawing added strength from, Nehru's own writing, there was a systematic attempt to rewrite the history of science in (and for) India in ways that illustrated the long history of science in India and its formative role within Indian civilization. Many historiographic projects between the 1950s and the 1970s, while making little explicit reference to Nehru, seem to reflect his views or draw on shared assumptions. Further research is needed to show how far Nehru provided the patronage and inspiration for individual works of scholarship or for more ambitious historiographic projects that linked historians and scientists, like the *Concise History of Science in India*, produced for the Indian National Science Academy.[26]

SCIENCE AFTER NEHRU

Was Nehruvian science a success? Or did it wither away with Nehru's death, the decline of Nehruvian idealism, and the many difficulties that beset India in the 1960s and 1970s? Was it tied to the destiny of one man, or did something Nehruvian persist, if only by

[24] J. Mahanty, "Science in the Universities since 1947," in *Science and Technology in India*, ed. B. R. Nanda (New Delhi: Vikas, 1977), pp. 112–124, on p. 113; B. D. Nag Chaudhuri, "Government's Role in Development of Science," *Indian J. Public Admin.*, 1969, *15*:303–315 (the eightfold increase is noted on p. 305); Singh, ed., *Jawaharlal Nehru on Science and Society* (cit. n. 6), p. 120 ("temples of science"); and Morehouse, "Nehru and Science," p. 496 (impatience).

[25] *Jawaharlal Nehru's Speeches*, Vol. 2 (cit. n. 10), p. 380; and Singh, ed., *Jawaharlal Nehru on Science and Society*, p. 123.

[26] D. M. Bose, S. N. Sen, and B. V. Subbarayappa, eds., *A Concise History of Science in India* (New Delhi: Indian National Science Academy, 1971). For a historiographic project that seems to draw on Nehru's views without making explicit reference to him see, e.g., Sen, "The Character of the Introduction of Western Science in India during the Eighteenth and the Nineteenth Centuries," *Indian Journal of History of Science*, 1966, *1*:112–122.

stealth, in the science of government policy and of research institutions and the way in which scholars continue to write about the history of science in India?

NS reached its apogee as an intellectual project and state program at the height of the nonalignment years in the 1950s and early 1960s. It was then that many Nehru-style history projects were conceived, even if they did not bear his imprimatur or reached fruition only years later. Long after his death Nehru continued to be eulogized, especially by members of the scientific and administrative elite he had helped create. In a special issue of the *Indian Journal of Public Administration* in 1969, Nehru was lauded for his foresight and direction. India was fortunate, declared one contributor, to have had a prime minister "who realized more than most people that science and its application are the only means to combat backwardness and increase the pace of national development." Another wrote: "Indian society continues to be weighed down by tradition. There is too much superstition and obscurantism around. There is still too little evidence in Indian life of the scientific temper, of the spirit of inquiry and of reliance on the scientific method."[27]

As state policy, NS reached a new plane of authority under the premiership of Nehru's daughter, Indira Gandhi. In 1974 a statement on national science policy was written into the fifth of India's five-year plans, followed in 1976 by an amendment to the Indian Constitution that made it the duty of every Indian citizen "to develop the scientific temper."[28] These moves arguably reveal more about Mrs. Gandhi's determination to consolidate her political position as her father's heir than the actual pursuit of science. Indira Gandhi and her son Rajiv, who assumed the premiership after her death in 1984, kept alive the idea of a special relationship between the Nehru/Gandhi dynasty and science and technology, as demonstrated by elements of Mrs. Gandhi's "emergency" program in 1975 and Rajiv's attempts to usher in a new age of technological modernity in the 1980s. NS clearly enjoyed a continuing political authority in India.

But by the 1970s and 1980s the image of NS had become tarnished—in part because it had failed to deliver all that had been grandly promised in the name of science, including the eradication of poverty. A reaction set in against state science and technology, and the violence and inequality that had accompanied it, led by such critics as Vandana Shiva, Ashis Nandy, and Arundhati Roy, though this mostly bypassed reference to Nehru himself. For instance, Shiva did not attack Nehru by name, instead blaming the "Green Revolution" that occurred after his death. But her evocation of Gandhi as an ecosympathetic counter to modern industrial science inevitably traded on earlier tensions between the Gandhian and Nehruvian approaches to science and technology.[29] Perhaps Nehru's scientific agenda has simply been appropriated by parties of both left and right (including the Hindu Bharatiya Janata Party) and so has lost much of its specific association with Nehru. But there was a partial revival in NS ideology in the early 1980s, in response to the perceived rise of irrational forces, including those of the Hindu right, in Indian political and public life. In 1981 a "Statement of Scientific Temper," calling for India to return to the ideal of a "scientific temper," was issued by a group of intellectuals, academics,

[27] Chaudhuri, "Government's Role in Development of Science" (cit. n. 24), p. 305; and L. P. Singh, "Editor's Note," *Indian J. Public Admin.*, 1969, *15*:ix–x, on p. ix.

[28] Ramesh, "Nehru's Scientific Temper Recalled" (cit. n. 11), p. 8.

[29] See Ashis Nandy, "Introduction: Science as Reason of State," in *Science, Hegemony, and Violence: A Requiem for Modernity*, ed. Nandy (1988; Delhi: Oxford Univ. Press, 1990), p. 5; Vandana Shiva, *Staying Alive: Women, Ecology, and Development* (London: Zed, 1989); and Shiva, *The Violence of the Green Revolution: Third World Agriculture, Ecology, and Politics* (London: Zed, 1991).

and scientists led by P. N. Haksar, an associate of Mrs. Gandhi. It is around this talismanic term that NS is most commonly invoked in India today.[30]

CONCLUSION

Nehruvian science has been presented here as a problem not just in the history of Indian science but of postcolonial science more generally. Clearly, there are ways in which that history is distinctive to India (and to Nehru himself), and certainly India, scientifically speaking, emerged from empire in a more privileged and powerful position than most ex-colonies. But the case of India and NS highlights wider characteristics in the postcolonial history of science—the strategic importance of postcolonial subjectivity for regaining a sense of local ownership over science; the attempt, intellectually and institutionally, to wrest science in the non-West from the legacies of Western hegemony; the centrality of science in the programmatic of socioeconomic change; the moral authority and political leverage of science in an age of competition between the great powers. Perhaps the core element in the postcolonial condition remains the dilemma as to how to fashion a science that is both local and universal, and this conundrum remains at the heart of much current debate about what science and the history of science mean to, and for, the non-West. Nehruvian science offers one means of trying to establish how that dilemma was articulated and how attempts were made, intellectually and materially, to resolve it.

[30] P. N. Haksar *et al.*, "A Statement of Scientific Temper," *Mainstream*, 25 July 1981, pp. 6–10; and Rajendra Prasad, "The Debate on Scientific Temper," *Social Scientist*, 1982, *10*:56–60. See also Ramesh, "Nehru's Scientific Temper Recalled" (cit. n. 11); and "National Workshop on Scientific Temper," http://blog.niscair.res.in/?=445.