

A.V. Hill and Shaping of Modern Science in India

Anasua Mukherjee Das

BRICSLICS, New Delhi – 110067, INDIA.

ABSTRACT

Professor A.V. Hill (1886-1977) was one of the pioneers who helped in the shaping of modern science in British India. He studied India's available S&T infrastructure in 1943-44 and suggested strategic frameworks for post-war reconstruction of R&D systems in the S&T areas. He had also influenced the workforce planning in post-independent India. This essay briefly identifies his contributions in the shaping of modern science in post-independent India. This essay pays tributes to Professor A.V. Hill on his 132nd birth anniversary.

Keywords: History of Science, History of Medicine, India, South Asia.

Correspondence

Anasua Mukherjee Das

BRICSLICS, New Delhi – 110067, INDIA.

E-mail: anasumukherjeedas@gmail.com

Received: 16-05-2018

Revised: 26-05-2018

Accepted: 28-06-2018

DOI: 10.5530/jscires.7.2.19

Nobel laureate Professor Archibald Vivian Hill (b. 26th September 1886, d. 3rd June 1977), also known as A.V. Hill, was a British physiologist and biophysicist. He was one of the founders of the diverse disciplines of biophysics and operations research. He was the recipient of the 1922 Nobel Prize in Physiology or Medicine (jointly with Otto Fritz Meyerhof) for his exposition of the production of heat and mechanical work in muscles. He was elected as a Fellow of the Royal Society, the United Kingdom, in 1918. He later served the Royal Society in different capacities. As an active member of the Royal Society and then the Biological Secretary, Hill was invited by the Government of India in 1943 to visit the country and to advise on the organization of scientific and industrial research as a part of India's post-war reconstruction plan. After visiting the lengths and breadths of the country for more than three months beginning on 16th November 1943 till 5th April 1944, Hill submitted a detailed report titled "A Report to the Government of India on Scientific Research in India" (Hill, 1944).^[1] This report later became a valuable sourcebook for the history of science and technology in modern India. UNESCO in its 1972 document "National Science Policy and Organization of Scientific Research in India" recognized contributions of the Hill Report in shaping S & T roadmap, infrastructure and institutional frameworks in India as well as in South Asia.^[2]

"The Hill Report: Professor A.V. Hill, then Secretary of the Royal Society of London, was invited by the Government of India to visit the country, in 1943, and discuss the organization

of scientific and industrial research as a part of India's post-war reconstruction plan. After a careful study, he submitted a valuable report embodying a forceful plea for the expansion and better co-ordination of research in India backed by liberal financial support from the Government. Two of the most important recommendations called for the establishment of liaison between India and other countries, and the creation of a central organization for scientific research. It was noted that so long as research organizations of the Central Government remained dispersed under a number of separate departments or bodies, most of them having many other duties and preoccupations, it was not possible to evolve a common plan to guide them all in the best interest of the country. It was therefore, proposed that all the scientific work affecting the welfare of the country, namely, in medicine and public health, agriculture and animal husbandry, industry, surveys and industrial resources, engineering and various services, should be brought under a single central organization, which would function under the Member (Minister) for Planning and Development. The Report also proposed the appointment of a Consultative Committee to advise the Member for Planning and Development on general policy in relation to research and on any special matters submitted to it. On the basis of these recommendations, the Government of India set up a Scientific Consultative Committee for Planning and Coordination of Research administered by the various departments." (UNESCO, 1972, p. 12-13).

Hill's Report was discussed or analyzed in details by many historians of Indian science and technology in the past four decades since the publication of UNESCO (1972) document. Eminent S & T historians in India, such as Deepak Kumar and Pratik Chakraborty, have discussed journeys towards producing the Hill Report that started commissioning of the one-man

Copyright

© The Author(s). 2018 This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

committee by GoI, gathering of information by visiting existing S&T institutions, reporting on existing S&T infrastructure available, and finally suggesting appropriate measures to be taken by the new government during the post-War reconstruction period. Some of the important observations, written by S & T historians while discussing the Hill Report, are produced below:

Kumar (2001, p. 388–389):^[3] “In 1942 a Council of Scientific and Industrial Research was established under S.S. Bhatnagar (1894–1955). Two years later A.V. Hill (then Biological Secretary, Royal Society) was invited to report on the state of scientific research in India. He talked of a quadrilateral dilemma, that is, population, health, food and natural resources. To him the fundamental problems of India were ‘not really physical, chemical or technological, but a complex of biological one referring to population, health, nutrition and agriculture all acting and reacting with another’.... Hill himself argued for centralisation (which he would not prescribe for Britain). Centralisation and concentration of power were to become hallmarks of the scientific establishment in post-independent India.”

Chakrabarti (2004, p. 290):^[4] “When the War came to an end, the question that bothered Indian scientists and policymakers were those of organizing and financing post-independence Indian industrial research. The tilt towards the British model became further prominent when A.V. Hill of the Royal Society was approached to advice on the organization of scientific and industrial research as a part of post-war reconstruction plan. Hill’s visit resulted in the famous A.V. Hill’s Report in 1944. Hill’s plan was generally in favour of a centralized research organization. Research agencies and national laboratories were to be constructed within the overall control of the government machinery, namely under the Member, Planning and Development. The Hill Report suggested creation of six Research Boards...”

Kumar (2008, p. 225):^[5] “In 1942, Council of Scientific and Industrial Research was established. The end of colonial era was pretty near. With the A.V. Hill’s Report in 1944 on Scientific Research in India, the curtain dropped.”

In the CABI online database of scientific literature, maintained by the Centre for Agriculture and Bioscience International (CABI), the Hill Report has a special mention. CABI describes: “This valuable report on the organization and application of scientific research in India includes references to biology and agriculture and will be of considerable interest to all those interested in the progress of plant breeding in India.”

This Hill Report is a highly cited document as reflected in the Google Scholar database. No doubt, the Hill Report will be steadily getting new citations, as it captured the essence of

scientific and technological progress in India during the much happening time for Indian and the world history.

In addition to engaging in a scientific mission in India, A.V. Hill also contributed towards skills development of the scientific workers in Commonwealth countries across the Global South. He then got engaged in rehabilitation of refugees in Europe after the devastating World War II, where the Royal Society was also actively involved. Earlier, Hill was involved in the development of military instruments and apparatuses for the British forces against the Germans. His efforts in the development of anti-aircraft gunnery, during the World War I, were greatly acknowledged. His involvement in calculating ballistic equations to construct accurate gunnery tables helped Hill to be considered as the pioneer of Operations Research. Thus, a new research domain, namely, ‘operations research’ was born during the World War I with the efforts of A.V. Hill and his team.

During his stay in India, Hill participated in the Indian Science Congress (ISC) in January 1944 at Delhi, which was presided over by Satyendra Nath Bose (1894–1974). Hill interacted widely with the Indian Fellows of the Royal Society, particularly for formally admitting four new Fellows namely Shanti S. Bhatnagar (1895–1955), Homi J. Bhabha (1909–66), Kariamanikkam S. Krishnan (1898–1961) and Birbal Sahni (1891–1949) into the Society, as they could not present themselves in signing on the Royal Society’s Charter Book. However, they preferred to sign on the Royal Society’s Charter Book in the historic room of the Society in Burlington House in England instead of in India. Hill also tried to hold a meeting of all Fellows based in India during 1944 ISC session.

Hill’s interactions with the leading Indian scientists, including the Indian Fellows of the Royal Society, led to the development of a structured institutional framework, as suggested in the Hill’s Report, which shaped Indian science during the post-war and also post-independent periods. Then the first Prime Minister Jawaharlal Nehru continued to shape Indian science through establishing new S&T institutions, laboratories, and related research infrastructures across the country for pushing the agendas of national development as perceived then by the public policymakers.

REFERENCES

1. Hill AV. A Report to the Government of India on Scientific Research in India. London: The Royal Society, 1944.
2. UNESCO. National Science Policy and Organization of Scientific Research in India. Science Policy Studies and Documents Series, UNESCO, Paris, 1972.
3. Kumar D. Science and Society in Colonial India: Exploring an Agenda. *Science Technology and Society*. 2001;6(2):375-95.
4. Chakrabarti P. *Western Science in Modern India: Metropolitan Methods, Colonial Practices*. Orient Blackswan, New Delhi. 2004.
5. Kumar D. Colonialism and Science in India. In: *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*. Springer, Netherlands, 2008.