

Lecture 27

Influence of Freedom Movements on Scientific Research in India

By the early twentieth century, the Indian society had started witnessing the first stirrings for freedom from colonial rule. While their political aspirations led to a demand for self-rule, the frustration resulting from economic stranglehold found expression in their insistence on using only goods made in India. Swadeshi Movement provided further impetus for:

- Promotion of education along national lines and under national control with special reference to science and technology; and
- Industrialisation of the country.

In 1904, an Association for the Advancement of Scientific and Industrial Education of Indians was formed. The objective was to send qualified students to Europe, America and Japan for studying science-based industries.

As mentioned earlier, in colonial India the environment was not conducive to higher studies, much less to research. Indians were allowed only subordinate posts and even those who had distinguished themselves abroad were given less salary than the Europeans of the same grade and rank. This ‘apartheid’ in science made the Indians respond strongly. J. C. Bose, the first noted Indian physicist, refused to accept this reduced salary for three years. Not only this, till the Royal Society recognised Bose, the college authorities refused him any research facility and considered his work as purely private. J. C. Bose was unorthodox in one more sense. He was one of the first among the modern scientists to take to interdisciplinary research. He started as a physicist but his interest in electrical responses took him to plant physiology. To fight for a place and recognition in the scientific circles in Britain was no less difficult than fighting against the administrative absurdities of a colonial government. Bose persisted and won.

Another noted Indian scientist, P. C. Ray had also suffered similarly. On his return from England in 1888 with a doctorate in chemistry, he had to hang around for a year and was finally offered a temporary assistant professorship. All through he had to remain in Provincial Service. P. N. Bose, preferred to resign, when in 1903 he was superseded for the directorship of the Geological Survey by T. Holland who was 10 years junior to him.

These problems were reflected on the political platform of the country. In its third session (1887), the Indian National Congress took up the question of technical education and has since then passed resolutions on it every year. K. T. Telang and B. N. Seal pointed out how, in the name of technical education, the government was merely imparting lower

forms of practical training. The Indian Medical Service was also severely criticised. In 1893, the Congress passed a resolution asking the government “to raise a scientific medical profession in India by throwing open fields for medical and scientific work to the best talent available and indigenous talent in particular.” Whether it be education, agriculture or mining, the Congress touched several problems under its wide sweep.

We find that the activities of this era had two important features. One was that almost all the exponents of Swadeshi looked to Japan as a major source of inspiration. Japan’s emergence as a viable Asian industrial power and its subsequent military victory over Russia in 1904-05 caught the imagination of Indians. Another characteristic was that quite often they showed revivalist tendencies. This may have been because the distant past comes in handy for the recovery of a lost self or reassertion of one’s identity. All these scientists were for the industrial application of modern science but failed to overcome certain cultural constraints, which was necessary for this effort. All they tried to do was to demonstrate that the Indian ethos and the values of modern science were congruent and not poles apart. In such a situation, it was not easy to evolve a correct understanding of our intellectual and cultural heritage. This was all the more difficult because of the total colonial domination both in education and in social life.

These efforts had, nonetheless, a galvanising effect. Taking advantage of the University Act of 1904, which allowed the existing Indian universities to organise teaching and research instead of merely affiliating colleges, Sir Asutosh Mookhejee took the initiative of establishing a University College of Science in Calcutta. Eminent scientists such as P. C. Ray, C. V. Raman, S. N. Bose and K. S. Krishnan taught there. This very college, although starved financially all through, produced a group of physicists and chemists who received international recognition. By contrast, the contributions of many government scientific organisations staffed by highly paid Europeans were rather poor. Those who put India on the scientific map of the world were many.

The need for an annual scientific meeting had been felt all along, so that different scientific workers throughout the country might be brought into touch with one another more closely. So far it had been possible only in the purely official and irregular conferences such as the Sanitary Conference or the Agricultural Conference. Thus, was born the Indian Science Congress Association (ISCA) in 1914 with the following objectives:

- to give a stronger impulse and a more systematic direction to scientific enquiry;
- to promote the interaction of societies and individuals interested in science in different parts of the country; and
- to obtain a more general attention to the cause of pure and applied sciences.

The objectives have not changed much since then and the ISCA has now grown into the largest organisation of Indian scientists and technologists representing all disciplines of science and technology.

In the wake of the first World War (1914-18), the Government realised that India must become more self-reliant scientifically and industrially. It appointed an Indian Industrial Commission in 1916 to examine steps that might be taken to lessen India's scientific and industrial dependence on Britain. The scope of the resulting recommendations was broad, covering many aspects of industrial development. But few of the Commission's recommendations were actually implemented. Similar was the fate of numerous other conferences and committees. Whenever requests were made by Indians for starting new, institutions or expanding existing ones, the government pleaded insufficiency of funds or inadequacy of demand. The interests of the colonial administration and those of the nationalists in most instances often clashed.

If we look at the events during the first quarter of the twentieth century, we find that this period was characterised by debate about further development. When Gandhi started his campaign for cottage industries, varying notes were heard at the annual session of the Indian Science Congress. P. C. Ray, for example, held that general progress through elementary education and traditional industries is a necessary precondition for scientific progress. But many differed with him. M. N. Saha and his *Science and Culture* group opposed the Gandhian path of economic development and supported setting up of big industries. The socialist experiments in Russia had unveiled the immense potentialities of science for man in terms of economy and material progress. The national leadership was veering towards heavy industrialisation and socialism, both of which stood on the foundations of modern science and technology. On Saha's persuasion, the then Congress President Subhas Chandra Bose agreed to accept national planning and industrialisation as the top item on the Congress agenda.

The result was the formation of the National Planning Committee in 1938 under the chairmanship of Jawaharlal Nehru. This Committee appointed 29 subcommittees, many of which dealt with such technical subjects as irrigation, industries, public health and education. The subcommittee of Technical Education worked under the Chairmanship of M. N. Saha. Other members were Birbal Sahni, J. C. Ghose, J. N. Mukherjee, N. R. Dhar, Nazir Ahmed, S. S. Bhatnagar and A. H. Pandya. The subcommittee reviewed the activities of the existing institutions to find out how far the infrastructure of wo/men and apparatus was sufficient in turning out technical personnel.

The outbreak of the Second World War (1939-45) and the interruption of the direct sea route between India and England made it necessary for the colonial government to allow greater industrial capability to develop in India. It was, therefore, felt necessary to establish a Central Research Organisation and this was eventually followed by the

establishment of the Council of Scientific and Industrial Research in 1942. As part of the post-war reconstruction plan, the government invited A. V. Hill, President of the Royal Society. In 1944, he prepared a report that identified various problems confronting research in India. These developments offered greater opportunities to Indian scientists in policy-making and management of scientific affairs. In fact, the origins of the science policy of free India and of the whole national reconstruction can be traced to these activities.

The foregoing analysis of British India illustrates that it was futile to expect the emergence of science here under an alien administration obsessed with one-sided commercial preferences. In such a situation, field sciences were developed to exploit natural resources and grow commercial crops; but a balanced development of research did not take place. When industry was not allowed to develop, many related sciences could not grow properly. As we have discussed, an atmosphere of vitality and exuberance in the social and economic life was necessary to bring forth innovative ideas and to encourage scientific progress. Individual scientists, however, did shine in adverse circumstances. It was all the more so under the influence of a larger social movement and struggle, which promised to liberate and transform society. Thus, the situation changed when India became independent in 1947. In the next lecture, we shall discuss the developments in science and technology in postcolonial India.