New initiatives for science in India

Science and technology are an integral part of any modern society. Science has indeed become a part of the cultural ethos of modern civilization. Over the past half a century, India has built up an elaborate network of scientific research institutions and far-flung university system which provides higher education in science. Many of the most visible triumphs of post-independence India have been based on the fruits of science and technology. Despite a long-term commitment to the development of science by successive governments, the momentum of the scientific enterprise in India appears to be slowing. There has been an alarming drop in the interest of young students to take to science as a career. India's research institutions have also aged over the years, with the inflow of young researchers becoming a mere trickle. India's vast university system is in a state of disarray and science departments have suffered greatly due to lack of investments, both material and in terms of faculty. The quantum of Indian contribution to basic research in some areas appears to be on the decline. Science no longer commands a central position in developmental policies or in the value system. It is indeed time for a fresh look at the future of India's science and technology system and to carefully address the many complex issues of higher education in India.

The growth in the number of universities and the expanded capacity created thereby, has not been matched by corresponding investments. Notwithstanding the rapid growth of universities and academic institutions, more than 90% of eligible, young Indians do not have access to higher education. This situation has economic implications, as the higher education system creates highly skilled individuals, without whom no country can expect to achieve a desirable degree of progress and economic development. It is extremely important that we achieve an integration of investments in national development with those in higher education and science and technology. At present we invest only a miniscule 0.5% GNP on higher education. This must be rapidly enhanced to at least 2% GNP. Indeed, it is imperative that the allocation of the entire education sector must increase at least over the Tenth Plan period from about 3.8% GNP to 6% GNP. Higher education must be viewed as a key tool for development and not as 'non-merit goods'. We must look upon the resources allocated to higher education and scientific research as key investments for the future, rather than as an item of expenditure.

The creation of the Department of Science and Technology in 1971 was a landmark in the development of basic scientific research in India. For the first time a mechanism for funding major infrastructure for science and support of individual investigator-driven projects was formally established. Subsequently, the creation and growth of the Department of Biotechnology recognized the important role of modern biological science in the important areas of medicine and agriculture. However, the rapid advancement of science internationally, requires that the mechanisms for funding basic science need to be revitalized, in order that they respond to the challenges of the future. To this end, it is essential that we establish a flexible and adaptive mechanism for funding basic research, with both public and private participation. To achieve this, the setting up of an autonomous National Science and Technology Council and a National Science and Engineering Research Board (NSERB) had been previously envisioned. This appears to be the right time to act decisively in establishing such a new mechanism, which is both administratively and financially autonomous. The frontiers of science are extraordinarily dynamic and assessment of changing priorities is necessary, even over relatively short periods of time. An autonomous body such as the NSERB, which oversees the allocation of resources to different areas of basic science, would be well positioned to respond quickly to an ever-changing scenario. An annual investment of Rs 500 crores on the support of basic science research through this new mechanism would undoubtedly yield a rich dividend in the future.

The realization that a knowledge infrastructure is fundamental to a 'knowledge economy' must guide our thinking on the support for academic and research institutions. It is also necessary to build bridges between our universities and research institutions on the one hand, and our national laboratories and R&D establishments, both public and private, on the other. One way to foster collaboration between our universities and major national agencies would be for the latter to set up full-fledged laboratories within the campuses of our universities and other educational institutions. This would go a long way in correcting a large-scale mismatch between our strategic departments on the one hand, which are overloaded, and on the other, underutilization of the vast talent that remains untapped within our universities.

There is an urgent need to invest in trained personnel to man our institutions, just as there is need to attract young talent to science. A central initiative to create professorships in chosen departments across the country would contribute in shoring up academic institutions. Schemes that permit utilization of the skills of talented teachers and scientists, who have reached formal retirement age will be an important step in maintaining standards in many disciplines, which have been hard hit by declining recruitments over the years. We recognize that the scientific community needs to raise standards of professional judgement in decision-making processes and to ensure that new schemes are administered with the greatest regard for common ethical principles. Indeed, one of the causes for the decline of science and many other academic disciplines is the fact that role models in academic life have been declining, even as the respect for teachers has almost disappeared in our society.

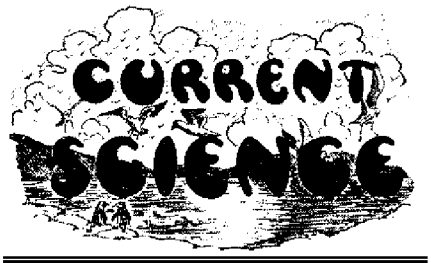
While the Government can help to promote and support science, and change the scientific scenario for the better, the role of the academies, research institutions as well as individual scientists is also important. For example, advanced research institutes should get involved in undergraduate education. Besides their established functions, the academies should consider new ways of supporting the research of outstanding scientists. Professorships and research fellowships of the type offered by some of the leading academies of the world should serve as a model. The academy would publish annually or biannually a science indica-

tor assessing the status of science in the country, and initiate better programmes to link with the society.

The academy is conscious that several issues such as the need for better undergraduate institutions in science, poor quality of teaching problems with teacher recruitment and evaluation, absence of an instrumentation culture, inadequate interest and expertise in areas such as engineering design, absence of a sufficient scientific component in medical education and poor managerial practices have to be taken into account while addressing the problems related to science and higher education sectors. However, the attempt here has been to draw attention of all concerned to the seriousness of the situation through this brief statement, hoping that this will arouse interest and bring out remedial and promotive actions.

In closing, it is important to reiterate the pressing need for the academies of science, the entire scientific community, the Government of India and indeed the citizens of this country, to reaffirm their commitment to science and technology as well as higher education as an integral part of developmental strategies. A concerted, collective effort will dramatically raise the level of science in India, so that this country can become economically strong, ensure its security in all aspects and confidently meet the challenges posed by the increasing technological sophistication of the developed world.

FROM THE ARCHIVES



Vol. V] MARCH 1937 [NO. 9

The Silver Jubilee of the Indian Science Congress

Just over 23 years ago, in January 1914, there met in Calcutta a Congress of scientists presided over by Sir Ashutosh Mukherjee. The meeting lasted three days, one Presidential Address and thirty-five papers were read, and the published proceedings extended to eight pages. The seed thus sown has now grown into the Indian Science Congress Association that we know at the present day, with a total membership of nearly 1,000, and a published proceedings of over 600 pages.

The holding of the first meeting was mainly due to the initiative of Professors J. L. Simonsen and P. S. MacMahon, who found, on coming out to India, that there existed in this country little opportunity for scientific discussion, or for scientific workers coming into contact with one another. From the beginning the practice was adopted of meeting at different scientific centres each year, and up to now the Congress has met at Calcutta, Madras, Lucknow, Bangalore, Lahore, Bombay, Nagpur, Benares, Allahabad, Patna, Indore and Hyderabad. The Congress can thus claim to be truly national body, representative of the whole of India. In fact, the annual meeting can best be described as the great scientific *mela* of the year, and all who are able to attend look forward to the event.

Next January the Congress will be celebrating its Silver Jubilee, and to commemorate the occasion, a delegation of about 75 scientists from the British Association and elsewhere, under the leadership of Lord Rutherford, will be coming out to take part in the meeting. The session itself will be held in Calcutta, but for a fortnight before, the delegation will be touring in India, and visiting the more important scientific centres, thus emphasizing the All-India nature of the celebration. This fine manner of celebrating the occasion is one that should appeal to all, and we are glad to be able to take this opportunity of supporting the feature.

The cost of inviting out such a large delegation will necessarily be large. The British Association, however, have agreed to meet half the cost of the expenses of the delegation. The Indian Science Congress Association have, therefore, to raise not only the other half of this amount, but also the local expenses of the meeting, and the cost of producing four commemorative volumes on science in India. In all about Rs 75,000 will have to be raised by the Association, for it has no permanent fund of its own upon which to draw. Already a sum of Rs 28,500 has been given or promised, of which the Government of India have generously contributed Rs 20,000. About Rs 46,500 therefore remain to be raised, and it is hoped that with the help of the Government of Bengal, with donations from Indian and British firms, from learned Societies, and from members of the public, it will be possible to raise the greater part of this sum. It is necessary, moreover, to appeal to individual scientists in India to contribute to the Jubilee fund, and it is this aspect that we particularly wish to stress in this place.

The benefits that will be obtained by the younger generation of research workers and students in this country, who will be able to meet the delegation and take part in the sectional meetings, can hardly be overestimated. Not only are all members of the delegation being asked to contribute papers, but special emphasis is being laid on the holding of discussions on subjects that are of mutual interest to both the members of the delegation and to scientists in India. The occasion will in fact be a unique one, and we believe that scientists in this country will be proud to feel that they can materially help towards its success. An increasing number of Indian scientists proceed every year to Europe to sit at the feet of eminent savants, or to collaborate with them in research work; and in drawing up the list of names of those scientists whose presence in India would be most appreciated, particular call was taken to include those who had come into contact with students from India. These members of the delegation in particular will be specially welcome in India, and we have no doubt that their coming will be an additional incentive to scientists in India to contribute generously to their expenses.