Need for a Bharatiya S&T policy for global resurgence

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It is globally recognized that India's contributions to science have been significant since the pre-historic and Vedic periods till the medieval times. Our contributions, not only in applied S&T areas like agriculture, healthcare, metallurgy, architecture and water management, but also in basic sciences like mathematics, astronomy and chemistry have been pioneering all through the ages. The resurgence of Indian science during the independence movement has the prominent examples of J. C. Bose, C. V. Raman, S. N. Bose, P. C. Ray, Meghnad Saha, Birbal Sahni, S. Ramanujam, P. C. Mahalanobis and several others. However, the general inadequacy of S&T contributions in the post-independence era has been a matter of great concern, despite significant achievements in some areas, viz. atomic energy, space, agriculture and defence S&T.

Since India was one of the first countries in the world to have created a Ministry of Scientific Research and Natural Resources, way back in 1951, it resulted in quantitative expansion of modern Western S&T base in the country over a wide spectrum of areas. The Scientific Policy Resolution (SPR) of 1958 only helped in the acceleration of the pace of industrial R&D infrastructure, but its contributions to meet the aspirations of Indian people have been far from satisfactory. Most of our S&T efforts during this period have largely failed to either make original contributions or create any significant impact on the scenario of the so-called emerging and cutting-edge areas of S&T. Most of our S&T institutions have been at best, constantly trying to catch up with the West, and 'bridging the gap' in their efforts to copy the West.

In my opinion, one of the main reasons for this state of affairs lies in the Western ethnocentric paradigm of our SPR itself, which lays undue emphasis on modern Western science as a tool to achieve 'industrial development', so that 'reasonable material and cultural amenities can be provided for every member of the community'. Obviously, major efforts in the post-independence India had an obsession with the Western model of development which relies heavily on utilizing 80% of global resources to satisfy the ever-increasing consumerist demands of 20% of the developed population. In fact, several other ills plaguing the present-day world, viz. continuation of wars in various parts of the world to feed the mighty arms industry of the developed West, increasing economic disparities and hunger in the under-developed African and Asian nations due to indiscriminate exploitation of their resources or the new economic imperialism imposed in the name of WTO, etc. also have definite links with the global imposition of this 'superior' industrialized model. It is the obsession of our elite planners with this model of development which has resulted in the widening regional disparities and the rural–urban divide in this country.

While there is increasing global realization about the non-sustainability of this model of development, our planners are yet to accept the ground reality. Whereas demands to generate alternative technologies are, therefore, increasingly coming up from the so-called developed countries, we continue to neglect the basic strengths in the sustainable nature of our indigenous S&T paradigm.

Several other problems ailing our S&T establishments also often emerge from our obsession with this Western paradigm. Thus, most of our R&D problems and projects borrow from the current developments/trends in the West and obviously the results have to be of 'international' standards to be presented to the Western peers in the field. Those who dare to undertake R&D projects on indigenous S&T problems and challenges are almost always ignored and branded as 'primitive and trying to live in history'. Those who dare to undertake R&D on aspects based on our tradition and culture are branded as 'revisionists' and 'fundamentalists' and obviously find little support from our R&D infrastructure. Near complete neglect of our indigenous languages in our S&T efforts has also left out the vast majority of Indian creative potential from any R&D endeavour. On the other hand, even for this Western S&T, we are unable to develop a 'work culture' in our S&T institutions which can deliver the desired international level of research.

Thus, we are facing a dual dichotomy of our inability to catch up with frontline areas of modern Western S&T on one hand and on the other hand, neglecting traditional S&T which has an inherent paradigm of sustainability and eco-friendly development. It is, therefore, no wonder that most of our R&D establishments are far remote from our people or their aspirations. It is equally distressing to note that most of our R&D effort has little to contribute to the problems of our teeming millions while a significant proportion of our 'brilliant' minds finds a fertile ground to contribute to the great S&T advances in Western laboratories, after having been trained at public expense in our S&T institutions.

It has been half a century since we became a republic and started planning for our S&T. Even our SPR was accepted by the Parliament more than 42 years ago. Our Technology Policy Statement, which was announced in 1983, has also become obsolete and often irrelevant due to changes in the national and global economic scenario. We need to take a fresh look at our S&T policies, not only to ensure sustainable development for equitable fulfilment of the needs of our vast majority, but also for a global rethinking where S&T will contribute to bridging disparities rather than widening them. It does not, however, mean that we neglect or remain isolated from the path-breaking developments in modern Western S&T. What we really require is to adopt an innovative mix of S&T which is relevant to our national needs and would also allow us to take leadership in a few selected areas of global R&D initiatives. It is high time that we discuss the implications of our SPR and suggest the need for a new S&T policy for the resurgent Bharat which will not only help us build a self-reliant Bharat, but also set the tone for a changed global paradigm of *Sarve Bhavantu Sukhinah*.

The new paradigm

In the proposed paradigm, S&T has to also focus on ensuring fulfilment of the

basic needs of our people, particularly those living in rural areas and urban slums, while continuing to strengthen basic research in selected frontline areas of modern Western S&T. There is an urgent need to create and strengthen R&D infrastructure for traditional Indian sciences, where India has the potential to become the world leader. Special efforts will have to be made to encourage study and research in traditional as well as modern S&T in Indian languages, to ensure involvement of the vast Indian intellect in general and particularly that of artisans, kisans and traditional S&T practitioners, for harnessing their rich knowledge potential. This will also help in developing and adapting such frontier and eco-friendly technologies which shall ensure value addition to our resources, minimization of waste generation and creation of increased employment opportunities in rural areas and smaller towns. Thus, we require a new S&T policy for sustainable development in the twenty-first century.

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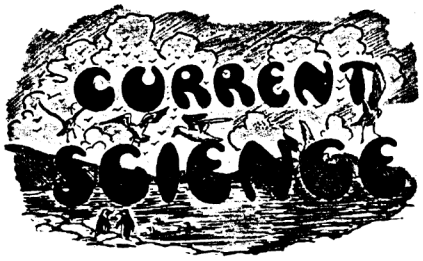
FROM THE ARCHIVES



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Over-population in India

In an extensive note recently published in the press, the Public Health Commissioner with the Government of India was reported to be contemplating a discussion of the problem of over-population in India in an article about to appear in the *Indian Medical Gazette*, and also as making a suggestion, that the Federal Administration should deal with the issue of family limitation as a remedy for combating the baleful consequences resulting from an uncontrollable increase of population. In many provinces large masses are at the level of bare subsistence, with hardly any clothing or house furnishings but possessing quite a remarkable power of fecundity. Few will fail to be impressed by the prevailing misery, squalor and poverty of the Indian people, and among the numerous public matters with which the Government of India will shortly be confronted, the subject of raising the economic level of the country and of improving the standard of living of the common people must necessarily occupy the foremost place.

Modern civilization is full of paradoxes. In the midst of plenty people are allowed to suffer. The banks are embarrassed by a plethora of money, but are unable to release the funds for providing relief to the unemployed. Gold always regarded as an incorruptible standard of currency, has been deflected from its appointed task, with the inevitable effects of discouragement and arrest of business involving human unhappiness. Increase of population considered a sign of public prosperity in the past, has now become a menace. These strange and alarming phenomena in human affairs must inevitably puzzle the ingenuity of all Governments, and perturb the hearts of public leaders. It seems to us that at the root of all these troubles lies the currency problem. The recent policy of sovereign governments of hoarding gold and silver is obviously due to the apprehension of a shrinkage in their supply, and their immobilization paralyses trade and increase unemployment. If the world would adopt a form of currency, incapable of maldistribution or of being cornered, which could be used purely as a counter or a cheque between services and commodities, perhaps the other social problems might admit of easy solution. It is the inefficient system of world economics that has made some of the existing population superfluous, and the remedies suggested for restricting the increase are in the nature of an experiment in human biology.

We know that the humanitarian measures, which governments and voluntary public services have adopted for the promotion of the peoples' health and happiness, provided also the cause leading to an absolute increase of population. But no one can seriously suggest the suspension or repeal of all attempts at sanitation and the prevention of disease, the provision of famine relief measures or the protection of the person and property of the people as one of the remedies for over-population. It may be possible to absorb the superfluous population by an extension of irrigation, improved methods of agriculture, emigration and closer settlement of sparsely inhabited lands and by developments in industry and commerce. The limits of what can be done in these directions must be reached sooner or later, and possibly in most parts of the world they must have been already reached.

We are not arguing against the new doctrine of family limitation. Its object is, however, gradually realised by the operation of those social phenomena which we have noticed. It is established by the American school of investigators with a fair measure of probability that education, occupation, better housing and a higher standard of life have individually the power of affecting more or less permanently the rate of fertility. The hope of restricting the population of India seems to lie more in the rapid and energetic promotion of those social developments which must inevitably effect fertility rate, than in the promotion of the artificial methods to which sentiment and custom are hard to be reconciled. The results in the latter case are spectacular, but those arising from the former must be progressive and slow.