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What ails Indian science?

IN the post-Independence period, the country has witnessed a rapid increase in the number of science institutions and the approach has been to transplant the Western science culture on Indian soil. The assumption that the availability of infrastructure to carry out research will take us to the forefront has turned out to be false. India is still in the back bench though premier institutions have come up comparable to any of the Western ones. The answer to the question, what ails our science has sociological, cultural and political facets. This article lists a few of the problems and suggests possible remedies.

Science, as it appears, has no national directive. There is no obvious national goal except in a few areas like atomic energy, defence and space. It is not uncommon to find two laboratories looking at the same scientific problem working in total isolation. Lab to lab collaboration does not exist. What Indians should achieve through science is still a question yet to be answered clearly. Many times they are imitators trying to manipulate and repeat what has been obtained elsewhere. By the time Indians catch up, this would have gone ahead further. A close look at the scientific breakthrough of the past few years is enough to establish this point. Only very few far-reaching discoveries have come out in the post-Independence period though the number of scientific personnel has been steadily increasing.

Personalised approach

A personalised approach to science is gaining momentum in the recent past. The scientific problem pursued by an individual often becomes his exclusive property. Anyone wishing to work on that or a related problem is looked upon as a competitor. It is of course healthy if the competition is fair. It hampers science if one competitor is fairly bigger than the other. Then it just becomes the rule of power.

Scientific equipment is also looked upon as the property of an individual. Despite the availability of an analytical tool, it is quite common to find a researcher going elsewhere to get an analysis made. The analytical tools of another lab are used merely on the basis of personal connection. Many a time this itself may not be poss-

ible leading to the abandoning of the analysis itself.

Nowadays most often basic science is pursued to publish research articles or to climb up the professional ladder. It is not our intention to say that everyone is doing so. The entire set-up for assessing one's ability has to be blamed for it. The scientific reward structure and the promotion criteria have to be overhauled completely. Since these are done mainly on the basis of the number and nature of publications, it is natural that everyone runs for it. For instance, an individual researcher trying to develop a technology that has already been known abroad is unlikely to get any publication (and recognition).

Fabrication of machinery

This is true of the development of scientific equipment also. Many people do not venture into fabrication of scientific machinery just for the same reason. As a result of it, scientific instrumentation in India is not an active area of research. This leads to the import of scientific equipment. Even very common analytical tools are not made in India.

The import of scientific machinery leads to a very high outflow of foreign exchange. A portion of it is going as commissions to the Indian agents representing the foreign manufacturing firm. A major chunk of most of the research grants is spent on the purchase of equipment. Since the science that is pursued has a Western lenience, hi-tech instruments are required to catch up with the so-called 'frontier areas.' There is no option other than to import these. An original idea needs a new method of testing which most often requires a new equipment and it has to be developed. Then only new knowledge can evolve. It has to be remembered that Dr. C. V. Raman fabricated the spectrometer to test his idea.

Just get into any of the modern Indian laboratories. It will be a tedious task to locate a single "made in India" brand. Everything is foreign. So, most modern Indian laboratories are not very much different from any of the foreign laboratories in appearance. In essence our trained people are very much suited for these foreign laboratories. The Indian labs are often stop-gaps for a majority of upcoming scientists. Most of those, who

go abroad, do the work of manual labourers, operating machines or turning knobs.

This outflow of scientists and engineers — the so-called brain drain problem — is not new to the Indian science scene. What else these trained people should do it is often asked. The training we have given them is foreign, the methodology they have used is foreign, and they are the product of this Western structure. They have lived, grown and so fit only in that frame. Moreover there is no proper opening for these people in India. How many of the people working in areas like biochemistry, biotechnology, biophysics and genetic engineering can get proper placement in India? It was Prof. C. N. R. Rao, Director, Indian Institute of Science, who said that science graduates had to take to soap selling. What a pathetic situation we have ended up with! The root cause of this can be traced to the continuing erosion of the university structure. It will of course worsen with time if we continue to proceed in this direction.

While joining for research a student mostly will have a puritan approach towards doing science. Most of them will be unable to accept the prevailing situation and find themselves in an imbroglio. Very soon they adjust to the situation, identifying themselves as one among the group (some at the cost of exuviating their conscience) and a purgation becomes mostly impossible. They learn the rules of the game, become scientists and the cycle repeats itself.

How many of our professors themselves really do the work? Once they come up to this stage, most of them either become managers or politicians. Very few of them have exposure to the current scientific literature. Many of them just do not visit the libraries. They survive because of the research students under them. For a majority of the senior scientists, doing science with their own hands is shameful, in sharp contrast to the western researchers. This leads to three important consequences: (1) The students under them lack adequate training; (2) the students' attitude towards guidance develops in a very similar way; and (3) the professor himself becomes a data manipulator.

The administration in scientific institutions is just the same as what prevails elsewhere. It is

very common to see sophisticated instruments lying idle just because of lack of manpower, electricity, water or air-conditioning. Lethargy and red-tapism often kill scientific temperament. One can see big computers worth lakhs of rupees lying unused. At the same time, a nearby research lab may be looking for a computing facility. Why cannot the available computer time be divided among the institutions? It is not only the administrators who have to be blamed. The scientists themselves are very similar people. Once they get into a permanent position, their enthusiasm somehow vanishes. The inertia that kills the entire bureaucracy is encroaching upon science also. All the evils that we associate with bureaucracy infest the scientists. One industrialist, said that someone had to get an air ticket for a senior scientist as a compliment for purchasing an equipment. No one knows what else these people do manage in the name of science.

Industrial needs are mostly forgotten by the research laboratories. Industries and research laboratories are supposed to work hand-in-hand. In fact, it is very much of an Utopian concept. Equipment and infrastructure for applied research are lacking in a majority of the industries. So, they often come to the research laboratories

to carry out experiments. The proper channel for this is very much time-consuming and most often not very welcoming. Industrial research and development because of its time-bound nature cannot afford to spend that much of time.

Almost all scientists working in research labs, have no industrial experience. Scientists from universities going to industries and vice versa is a common practice abroad. This is unheard of in India. It is natural that industries are alien to the scientists of research laboratories. Many scientists have no connection with even the public sector industries. A scientist working in an industry is often looked upon as a substandard specimen.

Self-reliance in science and technology is just another theme for us to debate over, presided over by a top scientist. Wherever technologies were not available, for example, space, defence and nuclear energy, we have developed them. But in almost all other areas, we have imported the knowhow. But sadly, we have not tried to improve it. As time goes on the technologies that we have bought become outdated and we will be compelled to import newer ones. The story of the steel and silicon industries is enough to establish this point.

Universities have been neglected and most of the money is directed to premier institutions. Even primary facilities to carry out basic research are not available in most of them.

At this point, it is important to realise that radical changes in the present structure of science are not possible from within. The structure itself is such that it resists any thorough change. Those who are inside have their own petty ends to be met. Whatever sermon that these people deliver in discussion meetings will not serve its purpose just for the same reason.

We have to give priority to the national objectives that we wish to achieve through science. The role of institutions and universities in achieving these objectives should be spelt out. The institutions and scientists should be accountable to the nation. There should be periodical evaluation and, if need be, the position, funds and facilities should be withdrawn. Individuals of proven excellence should be promoted.

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dence would mean that a woman should go freely along the street without aid in the dead of night. Reform to be effective should be a two-way traffic. The attitude of a male towards a female should change. Such a nation will be free and happy from all problems. Then only women's development will have real meaning.

C. Paramarthalingam, Madurai

“What ails Indian science?”

Sir, — It was heartening to read the article, “What ails Indian science” (March 19). The authors have to be complimented for effectively highlighting the gloom looming over Indian science. One painful factor for this is Indian scientists', 'western mania'. The 'slave mentality' in faithfully adopting whatever the westerners propose is the malediction of Indian scientists. Any thought provoking concepts and ideas from our own sphere are not accepted from my own experience. This derelict attitude has to be abandoned for any salvation. The question is not when, but before it becomes incorrigible.

Dr. S. Balajee, Madras

Sir, — The article “What ails Indian science” (March 19) was a realistic exposition of the present state of affairs in our country.

Science is fettered in India. It is due to the caste based selections for entry into school, college and service. Merit takes a back seat. Talent is not assertive. It moves on the path of least resistance. Uncertainty and anxiety corrupt merit. Like a desperate man taking to drink the few scientists

of merit take to politics dissipating their time and energy in unproductive channels.

Most of the scientists in India lack national pride and are ever willing to play a second fiddle. Scientists in high positions deliberately fake results and encourage the juniors to do just that to be able to bask in the sunshine of publicity for a short while earning notoriety for the entire scientific community for ever. No one, not even the scientists in India, believe that science has a future in this country, as most of them indulge in pot-boiling research as one wiseacre put it Sycophancy is practised to the level of artistry. The few that do not care are left out to gather dust.

Identification of the problem is not enough. In our democratic set up it is the policy to establish social justice ever since we attained independence. If that be so it is better not to plan high but stick to activities compatible with the available levels of science and technology as drawn from strata previously decided upon due to various political considerations. To be fair to the meritorious and the talented they may be permitted gracefully to go out of the country. Even as they are rejected they earn our foreign exchange.

There is nothing wrong with our bullock cart technology. Balancing our internal and external finances is more important. If our economy sustains itself on sound lines science and technology will upgrade itself gradually with the weaker sections gaining strength and confidence.

K. Rama Rao, Secunderabad

HNDV

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