

Bangalore

Jan 1991

IAS - Group

i. Phology :

Not Sciences in India (Trends) -

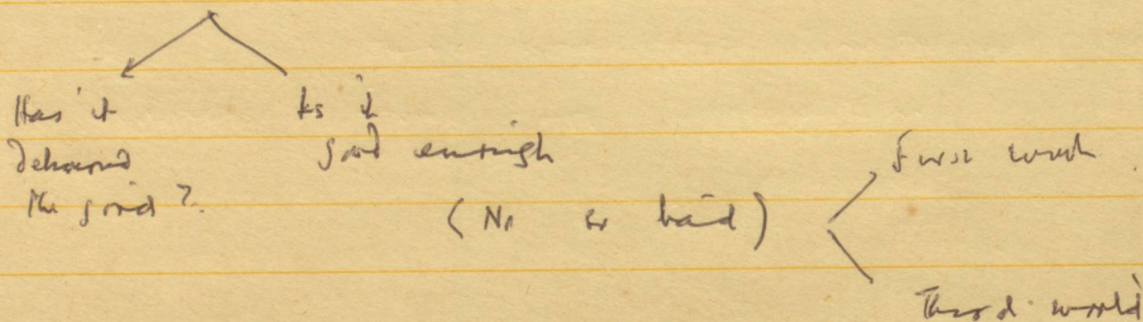
One would have to talk of Science and Technology -

- Policy
- Problems
- Appropriate technology

(May be you can raise them questions at the end)

2. Science not doing too badly -

Expanded. (Both science and technology) & Restricted



Why are we not doing better?

(How we manage science)

National Institute of Advanced
Studies, Bangalore Pursuing Science in India
Seminar on Trends in Science

26th January
NIAS - Bangalore

Introduction:

When Prof. Ravi Kapoor asked me to speak at this symposium on Trends in Science and Technology, I felt some hesitation. "I realize" said Prof. Kapoor "that your field is biology," but you have been, in various capacities in a position to examine the panorama of Indian Science". I suppose he had in mind my long association with the Indian Academy of Science and my membership of the various advisory committees. Trends, other than the very obvious ones, are hard things to discern and panoramic views are likely to be superficial. Prof. Kapoor gave me some leeway by adding "we will leave it to you to decide the exact title of your presentation".

One of the objectives of the National Institute of Advanced Studies is "to widen the mental horizons of senior administrators from government and industry." It will be highly presumptuous of me to believe that anything I might have to say could possibly have this effect. But it occurred to me that in this audience there will be several who have to do with the administration of science. Here was my opportunity for a dialogue. In ~~see~~ the 30 minutes or so that are available to me I will make some remarks on the

administration of science in India. These remarks are not meant to reflect profound experience or deep analysis. Actually my own experience of science management is limited, confined to dealing with a few colleagues rather like myself; it is therefore not likely to be representative or all-encompassing. What I am going to say is more in the nature of casual observations. I hope these will provoke some discussion.

Over the 30 years that I have been watching the Indian science scene I have become increasingly convinced that one of the major impediments that hinder the progress of science in our country is its administrative structure. I am not alone in this conviction and others including some of the prominent architects of science in post-independence India such as H. J. Bhabha have forcefully expressed this view. When then, we must ask, does this archaic system, designed as it were to kill the human spirit, continue to flourish; indeed it appears to get stronger day by day.

It will be incorrect to imply that all ills of Indian science arise from poor management. Many of our problems, perhaps a major portion have to do with what is the next concern of the National Institute of Advanced Studies - the historical, social, cultural, political and economic context of the 'increasingly complex society' in which we have to function. That you will agree is quite a handful.

A mere scientist cannot deal with this subject unless he is also a social reformer, a revolutionary or a preacher. I will therefore stick to the serious part of my subject.

Quest for autonomy:

Some years ago when I was in the Scientific Advisory Committee, I persuaded its chairman Prof M. G. K. Menon to take up the question of the autonomy of scientific institutions in the SACC. I had assumed, as I see in retrospect, somewhat naively that a wide-ranging discussion in the SACC followed by an agreed recommendation to the Cabinet might help to loosen the shackles of bureaucratic control that seemed to be growing all around. That did not happen. But the SACC did devote several of its meetings to the subject. I was asked to collect views of leading scientists, both in the SACC and outside on this matter, and many of them were good enough to write to me. I thus came to possess a voluminous file of opinions from a wide cross-section of scientists including government secretaries, heads of agencies, Directors of Research Institutes, captains of industry, university professors and working scientists. There was universal

agreement that there is a problem and something needs to be done. There were sharp differences in the perception of the problem, in emphasis and in the remedies that were proposed. Altogether it was an educative and somewhat chastening experience. I would like to share with you some of the ~~issues~~ ^{issues} that were ~~raised~~ ^{raised} in this discussion.

Expansion of Science:

One of the obvious facts about science and technology in post-independence India is its expansion. This is largely the outcome of Jawaharlal Nehru's view of science and his science policy. Nehru believed that "of all the big problems that face India today, nothing is more important than the development of scientific research both pure and applied." With the help of Mahalanobis, Bhatnagar and Bhalla, Nehru put this policy into practice and the policy has been followed more or less unchanged by his successors. In 1947, about a tenth of a percent of our GNP was spent on scientific and technological research. This figure now stands at over 1%. Scientific ministries, agencies and departments constitute a significant portion of governmental structure.

India has industrialised and increased its agricultural production very considerably. There

is some argument about how much scientific research has contributed to economic growth and many believe that the application of science to improve our lives has lagged. Perhaps we could have done better but in any case, thanks to Nehruvian policies we have acquired a large reservoir of technical manpower and infrastructure that can be put to good use.

On the purely scientific front, the question is often raised. Is our science good enough? Is its quality commensurate with its cost? Lack of quality in our scientific endeavours was noticed by Nehru himself. Addressing the Science Congress at Delhi in 1963 he asked "Why is our science not as good as the best in Europe and America? We sacrifice, it seems to me rather cover up quality with quantity".

Governmentalisation of Science:

The first organizations to deal with scientific research were set up by the British government. When new agencies and institutes were set up after independence, it was recognised that to deal effectively with such non-traditional activity as science and science-based development, a new kind of administrative

climate is required. It was as a consequence of this recognition that the government of India set up special departments and agencies to deal with scientific activity.

Some of the new departments made radical departures from the traditional administrative framework. The early success achieved by the departments of Atomic Energy and Space, for instance was closely connected with the boldness and dynamism displayed by their leaders in generating a new working climate. Nevertheless, for a variety of reasons, the administrative environment in which science has to function remains inappropriate and constraining.

There has been a large-scale and uncritical transfer of rules, procedures and methods of control originally designed for non-scientific and routine activities to scientific organizations. The attendant bureaucratization that has occurred, is, now, a major obstacle in the growth of vigorous scientific activity. Indeed there appears to be a regressive trend towards increasing bureaucratization even in those organizations that were earlier able to make radical innovations in their functioning. With growth in size and scale of operations, scientific organizations

faced with internal problems have, on their own tended to revert to standardized governmental practices. Education institutions and universities which functioned as autonomous bodies are increasingly adopting unsuitable norms and practices.

Accountability:

Any discussion of scientific freedom must grapple with the problem of misuse of freedom, the necessity of accountability. The ~~real~~ issue is not whether freedom should be unlimited or restrained. The real issue is the meaning and nature of accountability, which very often reduced to an accountant's idea or a filing-clerk's idea of accounting. Autonomy does not mean freedom from the government of the country nor is it a problem between the government on the one hand and the scientists on the other.

In modern societies scientists participate in government work on a large scale and occupy managerial positions at many levels. The need for autonomy arises at each level, between ministries and agencies, between agencies and research institutes

or between the head of an Institution and his colleagues. It is a matter of settling and respecting mutual obligations and responsibilities which cannot be settled by a standard set of rules.

Scientific activity requires a high degree of initiative and autonomous action. Traditional organisations tend to be largely hierarchical. Policies and directives are expected to flow from the top. Freedom of action at any level is constrained by the authority of another level to block action. Such an arrangement is unworkable for scientific work. Here one is, more often than not, dealing with problems which are unresolved and unprecedented. Decentralization of initiative and abundance of feed-back at every level is essential.

Autonomy need not imply a licence for the scientist to do just what pleases him. In order for scientific institutions to work at their best, all concerned must develop a clear perception of their legitimate roles, the government, the managers of the institution and its scientists. In a country as large as ours, there is bound to be a variety

of institutions, each with its own range of objectives. At one extreme there will be soundly technological projects with well-defined, closely monitored and time bound targets. In such projects, the freedom exercised by individual scientists in the choice of their work is limited. The emphasis is on the choice of the pathway to reach the end result, rather than the selection of the problem. At the other end there will be institutions dealing with pure science, where the freedom of the researcher is restricted by his own talent and imagination. Each type of organization needs freedoms that are appropriate to its own functions. In either case it is crucial to preserve the spirit of adventure and enthusiasm that gives scientists a feeling of purpose.

Points for action:

All discussions on the health of science lead to a list of suggestions which need to be implemented. The discussion in the SACC too produced such a list of principles which should govern an enlightened administrative policy for

Science.

a) Strong institutional leadership ; With such a leadership autonomy will not be misused. Without such a leadership, even the freedoms that exist will fall into disuse.

b) Financial autonomy ; Government must determine the budget but not worry too much about regulating expenditure. This must be left to the governing bodies of the Institutions. National policy can be best implemented through wise decisions on the over-all allocation of resources.

c) Professional accountability ; A rigorous review by professional peers should be enjoined upon every institution.

d) Appointments and personnel policy ; Institutions must be fully autonomous in all matters connected with appointments ; This includes selections, promotions and termination of appointments and determination of salaries.

e) Elimination of arcane rules and procedures: At present such procedures intrude upon every aspect of a scientist's work and include such things as purchase of equipment, use of stores, stationery, travel, leave rules, housing and so on. There is crying need for modernization and simplification of such rules. The assumption that because the funds come from the government, the rules prescribed by the government are the best is a patently false assumption.

Very similar conclusion of Daniel.

Iyengar & G Venkatesan

Autonomous agencies and institutions ~~must make~~ ^{evolve} their own and must evolve their own procedures.

Conclusions:

One of my correspondents Professor Vallathau wrote a perceptive letter pointing out the difficulties in the way of reform. He put his fingers on the causes of the present predicament somewhat pithily.

"The threats to autonomy" he says

come from from several sources, - the principal ones are listed below:

- 1) Publicans: ~~who are innocent~~ They tend to force populist decisions and interfere in appointments
- 2) Burocrats: Who are innocent of the dynamics of science and whose view is limited to procedural details
- 3) Employees trade unions: Who believe that institutions exist for them and that science is secondary.
- 4) Poor leadership: Which brings autonomous institutions into disrepute
- 5) Bad Scientists: Who work from 9 $\frac{1}{2}$ to 5 and are really Karamcharis in white coats

Who will bring about the desired changes and how. I am not so sure. Probably it is a long grind and the system will change slowly

only as the society changes.

On the other hand a great deal of improvement is possible within the existing framework. This is evident from the large differences in the working climate between the best institutions and the worst institutions often under a single department or agency. There certainly are great differences between different Departments and Agencies. This is our existence theorem and leaves room for optimism.

At the end two questions

① What kind of administration is needed for Science

② Do we have two kinds of Science?