

Problems of Indian science

SIR — Writing on "Science in India", (*Nature* 366, 611–626; 1993), John Maddox begins by saying that "never can there have been such a determination to attain improvement by science and technology as there has been in India since 1947, but success is sadly still long way off". He mentions achievements in fields such as space, atomic energy, radioastronomy and communications, but these activities do not touch the life of the common man.

The basic problem of development in India has been the decision-making process in Delhi, procrastination and secrecy. Many scientists/technologists in positions of authority have behaved like seasoned bureaucrats in shirking responsibilities and scuttling proposals.

When I was at the National Geophysical Research Institute, I was aware of specific instances where decisions were never taken on important proposals such as water resource development; the ECAFE (now ESCAP) proposal for joint offshore geophysical surveys in India's economic zone; airborne geophysical mapping for minerals, oil and ground water; a UNESCO proposal for a seismological network and a training and research centre in India; and detailed studies for earthquake hazard evaluation of Koyna and adjoining areas of Maharashtra.

A proposal was made for an integrated micro-level study that included all aspects of human life and its environment; it would have been implemented through a district-level task force involving the principal scientific agencies on the one hand and the state government agencies, voluntary organizations and local people on the other. But even though pilot projects in two or three districts were approved in January 1986 by the then prime minister, Rajiv Gandhi, it has still not seen the light of the day.

Science and technology have primarily helped only the 'rich' India. Even the basic necessities of life such as clean drinking water, hygienic living conditions and two square meals a day are not available to most of the population in rural India and those living in "the tin and cardboard shanty-towns on the outskirts of the major cities".

Maddox suggests that "the better strategy, for those for whom development is an urgent need, would be to exploit the willingness of the technical community elsewhere to assist". It may be an idea worth considering, but does India need foreign assistance? Every Indian prime minister since Pandit Nehru has urged scientists to make science and technology relevant to the needs of the people. Thousands of educated young people are unemployed, laboratories have rural technologies on the shelf and the present

prime minister, P.V. Narasimha Rao, has made available R30,000 crores (US\$10 billion) for rural development.

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SIR — In the discussion of misconduct in research, attention has centred on questions such as authorship and the influence of competition for research funds. I believe that the problem is much wider, and has its roots in the now almost universal separation of teaching and research. With the increasing concentration of research in dedicated laboratories and institutes, and the shift from basic to applied research, full-time researchers and research managers have developed a novel attitude towards research which they are able to force on members of the scientific community still working at teaching institutions. One result, of course, is the decline in the numbers of able people emerging from the classrooms.

The problem is especially serious in developing countries. In India, for example, where scientific misconduct goes to the roots of the academic system, a large part of the trouble is that crucial decisions about support for and organization of laboratory work are made by inactive and often elderly scientists. It has become the convention that to speak about scientific misconduct is considered to be an even greater evil than misconduct itself. It is high time that uniform standards in research and teaching were developed and applied globally.

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Self-help in Kerala

SIR — The elimination of the dread disease lymphatic filariasis, commonly known as elephantiasis, may soon become a reality in the state of Kerala where it has been endemic for the past century.

Filariasis, which is transmitted by the bite of mosquitoes, is known as *Manthurogam* or *Anakalu* in the vernacular language of Kerala. It is prevalent not only in Kerala but also throughout most of India. In India the disease is caused by two related parasites, *Wuchereria bancrofti*, which has a country-wide distribution, and *Brugia malayi*, which is mainly

restricted to Kerala. It is estimated that about 367 million people in India live in areas exposed to the risk of acquiring this infection.

Approximately 19 million people suffer from chronic forms of lymphatic filariasis and another 25 million are asymptomatic carriers. Though it does not kill, it can maim and deform. It also has an immense socio-economic impact on the relatives of victims because of the stigma attached to it. The victims and their families are often shunned by society when they try to establish matrimonial or other relationships. As the disease is not fatal, its control receives only a low priority for funding both at central and state government levels. Nevertheless, there is a ray of hope, as witnessed in Chertala, a small town in Kerala, where a people's movement, FILCO, has achieved what the government could not. This has been made possible with the help of a research team from the Vector Control Research Centre of the Indian Council of Medical Research.

This is the first experiment in India where the motivation and involvement of the community through social and economic developmental activities has contributed to near-elimination of transmission of the disease. This experiment may be the precursor of similar programmes elsewhere.

FILCO, which has already done a great deal in motivating the community to control the vectors of disease, has now launched the sale of salt medicated with DEC (diethylcarbamazine citrate) in the hope of eliminating the remaining traces of infection in this community. DEC is a safe and effective drug widely used for the prevention and treatment of filariasis. In a country such as India, with inadequate funds for sustained vector control and lack of effective governmental machinery for conventional drug distribution, DEC medicated salt seems to be the only effective method of eliminating microfilaria from the community and preventing the occurrence of new cases.

Kerala has a literate population. It also has both species of parasite, and both are vulnerable to DEC. Although the use of medicated salt does not obviate the need for mosquito control, Chertala has the special advantage that FILCO has already made mosquito control a part of people's lives by merging it with several developmental activities. Thus mosquito control becomes a by-product of the daily activities of the people.

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