

view foreign travel as a 'jaunt' to be enjoyed by a privileged few. Last year, the *Indian Express* published a statistic to the effect that the number of Joint Secretaries visiting the city of Paris alone during June 1997 was 42. The great

failure of the Indian scientific community, including its leaders, has been in not dispelling this misconception so far as *scientific travel* is concerned. Rather than worrying about which scientists have an easier time of it going abroad compared

to which others, we should all instead tackle this misunderstanding.

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Animals in research

I was shocked to read the editorial in the August 25 issue of *Current Science*, and learn that a 'Committee for the Purpose of Controlling and Supervising Experiments in Animals' (CPCSEA) headed by Menaka Gandhi has been constituted by the government of India and that the committee has decided to impose drastic curbs on the use of laboratory animals for scientific research by arrogating all powers to decide about animal-based experiments in the country.

Since many of the important points in support of animal experimentation have been made by the editor as well as in the article of Ramalingaswami, I will not repeat them. Besides killing biomedical research in the country, these curbs may give an excuse to unethical drug companies to market untested drugs and other products. The approach to helping the cause of laboratory animals is the three 'R's'—Refinement, Replacement and Reduction. Most animal facilities in the country are very shabby. The staff working in many of these facilities as well as the scientists and technicians involved in animal experimentation are not trained in humane methods of handling, care and experimentation. Lack of environmental control and genetic uniformity results in highly variable results and this in turn leads to the use of more number of animals and the necessity to repeat experiments.

Considerable restraint on needless animal experimentation is indeed needed. This can be achieved by not only educating and training the animal house personnel and scientists, but also the heads of institutions and agencies that give grants. Investment in modernizing animal facilities with suitable environmental controls (regulation of temperature, humidity, air changes, cleanliness) and caging, to ensure that the quality of animals produced and used is good, is necessary.

Many feel that since human beings do not live in controlled and hygienic environment and are genetically diverse, standardized animals are not necessary. This indeed is wrong thinking.

Refinement in animal experimentation, and replacement of animal models by other non-animate models (scope for this is limited) will lead to reduction in the numbers of animals used, the pain and suffering inflicted and increase the reliability of the results obtained. Most veterinary colleges do not have courses pertaining to small laboratory animals, and hence the problem will not be solved by simply insisting that veterinarians should head animal facilities and perform animal experiments. Human resource in this area is badly needed.

I am surprised that some heads of scientific agencies were on this committee which took such decisions. Perhaps they were too shell shocked to make their point. I do hope that those who subscribe to the decisions of that committee are refraining from use of any products which in the past may have involved animal experimentation! But then they would not be living if they did not. The entire scientific community with one voice should prevent these recommendations from becoming law. All science academies should speak up. On the other hand, they should share the concerns of the animal activists and institute robust ethical committees at the level of the institutes for careful scrutiny of the experiments to prevent unnecessary and bad experiments.

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V. Ramalingaswami has rightly pointed out (*Curr. Sci.*, 1998, 75, 344–348) the lacunae in the rules framed by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA). Besides the points raised by Ramalingaswami, there are also other rules which are to be given a thought.

Rules 3 and 4 state that animal breeders and establishments should register with the Committee within the given time (3 months for the breeders and 30 days for all the establishments in the country!) else they should not carry breeding and experimentation on animals. The Committee has not stated the time period for which the permission is valid and also whether it has to be renewed later. Does the Committee think that once permission is given, things will remain the same? The animal facilities may be good at the time of inspection, but as time passes, due to lack of interest the facilities may deteriorate but the establishment/breeder will continue to do experiments using animals. The Committee should therefore specify the duration of permission granted and the need to renew the registration.

Rule 5 (a) states that: Application for registration shall be made in the form prescribed in Annexure I. The committee would be empowered to inspect the premises where the experiments are to be conducted, animal housing facilities and other infrastructure for verification of facts mentioned in the application and for deciding the issue of registration.

This means that all the institutions which already have animal housing facilities should apply again for registration along with the new institutions. This rule should apply only to those new institutions/individuals who plan to do experiments. Institutions already with animal facilities would have taken permission from the concerned departments at the time of their establishment and hence

they should be asked only to inform the Committee about their experimental facilities. If in case all the institutions/breeders/persons in this country apply for registration, one can imagine the number of applications that are to be scrutinized and the number of proposed animal facility premises to be inspected by the Committee. The persons chairing the committee are important officials who are always busy. Can the Committee visit all the proposed animal facility premises and grant registration quickly (that too in 30 days)? To avoid this, the Committee should have appointed sub-committees for each state comprising individuals from Universities, research institutions, etc., whose job would be to inspect the pro-

posed animal facility premises in that state and grant permission if necessary. Governmental institutions should be exempted from registration.

Coming to rules 6 (a) and (b) which have been already pointed by Ramalingaswami, it is said that the concerned establishment should obtain permission from the Committee for each and every animal experiment to be conducted. This is impractical. The Committee should frame a rule that every institution/establishment must have an Ethical Committee consisting of individuals from various professions and any animal experiment must be cleared by this committee.

These rules will definitely hamper the progress of medical research in India at

a time when it really needs a boost. Instead of framing a new set of rules, the existing rules should have been amended and the system further empowered to punish offenders. Ways of being humane to animals and taming them should be taught right from school days. It should be noted that animal experiments are done not only for the well being of humans but also for the well being of the animals.

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Lopsided view on basic science

The editorial 'Funding basic science' (*Curr. Sci.* 1998, 75, 77) rather than making a convincing case for better funding of basic science seems to obliquely condemn the heavily funded defence research and development. I think the present Government and scientists like A. P. J. Abdul Kalam have good reasons to highlight the successful nuclear explosions and the development of the missile technology. In contrast, in the past on many occasions top scientists invariably cited accomplishments in the atomic energy and space research to counter the public criticisms pertaining to the malaise in Indian science, and blocked any move to enforce accountability. The reality about basic science done in our country is that even if no funding is provided to it, there will be hardly any impact on either the advancement of knowledge or any benefits accruing from it to the society. With reference to the editorial, let us ask: Is poor funding responsible for poverty of original research in India? Should we blame the bureaucracy and finance departments for inefficiency and mismanagement in utilizing the resources?

To answer the second question first, it is well known that most of the administrative positions in the funding agencies are held by scientists. In the Universities, Heads of Departments are Professors, and in many cases even Registrars come from the teaching profession. Therefore, it is

the bureaucratic mind-set of scientists and academics which has resulted in the degeneration of the system. And, it has not occurred as an aberration; policies since independence have cultivated this. Almost always parity of teachers/scientists with IAS officers (and now with CEO's) have been advocated, both by the policy makers and the media. The unsuccessful aspirants for IAS with no motivation for academic or research activity have entered into Universities and laboratories vitiating the whole system. It is a myth that higher salaries will attract talent into teaching or research; the only possible remedy is to reduce the retirement age to 55 years to get rid of the dead wood in due course of time, and drastically reform the process of fresh recruitments.

Once we understand this mind-set, it becomes easy to explain why original ideas or genuine basic research do not depend on funding alone, in fact, whatever little resources we have, are adequate to build a strong base for scientific talent. To give an example, the laboratory grants in the teaching departments are quite often misused and diverted to support other activities. Moreover, even a modest amount, say Rs 5000 per year to support experimentation with nature by curious young minds (say 50 in number) can induce a change in the environment, and create interest in basic science. Geometry and topology of the sphere, observing

the properties of the sun, experiments with light, simple design/assemble exercises with electronic circuits/devices, and studying complexities through fluid dynamical experiments are some illustrative examples in which the students will find excitement, and enthusiasm to try out some ideas. Unfortunately in the present system a routine $n+1$ th extension ($n \rightarrow \infty$) of an established work, which easily gets published in say *Physical Review* is given more credit than diligent innovative teaching work. This means that even the few good teachers do not take interest in this kind of work. If there is a will, funding is no problem: to forsake the privileges of air travel is not a big demand on Professors. The money so saved could be used for laboratories. We must not forget that imparting knowledge and understanding nature gives us immense joy, compared to which all forms of rewards and privileges are insignificant. Let those like IAS officers who are denied this happiness, avail other compensating pleasures. Let us not become the victims of the philosophy that money is everything.

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