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CORRESPONDENCE

Need for national level aptitude tests

Leakage of the IIT Joint Entrance Examination question papers, as well as the news that some of the papers of the Entrance Examination for Roorkee University were also available at a price, has brought to the fore certain issues which could have far-reaching implications for higher education in our country. The attraction of getting admission into a professional degree course has led to a flourishing coaching industry. The amount of money which some of the coaching institutes are charging to improve their students' chances is becoming so enormous that the probability of paper leakage is going to increase. The stakes in terms of money for some coaching institutes run close to a crore of rupees. Given the amounts of money at stake, whatever effort the institutions might make to maintain it, the confidentiality of their entrance test is ultimately doomed to be endangered. The economic logic is fairly simple. If it takes, say, Rs 25 lakhs as capitation fees to get admission in a private medical college, it makes simple sense to pay a fraction of this to a coaching institute which 'guarantees' success in the entrance examination (by fair or foul means).

So what is the remedy? Clearly, it is futile to pontificate on the need for parents to be enlightened when the societal pressures are so enormous. There is, however, one innovation which we believe could save the students from a lot of anguish and repetitive examinations. This is the idea of a National Level Aptitude Test which could serve as an independent and reliable benchmark to grade students. What is proposed is a test like the Scholastic Aptitude Test (SAT) in USA which serves as an important input into admission considerations of universities there. Such a test, together with the result of school leaving examinations and other

inputs (like interviews etc.) can then be used to develop a criterion for admitting students to various institutions and various courses. For example, the IITs could decide to take the top 2000 students in the sciences who also have an excellent school record. Similarly, every institution will soon settle down into a pattern depending upon its needs.

We suggest two national level tests; one general aptitude test after the 10th standard and a second test in the 12th standard. This could be specialized and there could be one for each subject. The tests will be held on a common course pattern which will also help standardize the various board examinations that exist at present in the country. Invariably there is a tendency for each board to look down on other boards and, in the absence of any procedure for standardization, the dispute continues. Standardization will also motivate different regional boards to formulate their syllabi and develop their examination in a form which will help their students to compete at the national level.

Setting up of an autonomous national level body

The first step in this direction would be to set up an autonomous national level body for administering these tests. This body could then create a state level network. The basic tenet in the test would be complete centralization of the preparation and design of the question papers. This would be essential for reasons of confidentiality and accountability.

The test could be held at the district level or even at the level of a sub-division. Given that districts are now connected through NicNet, it would be easy to

monitor the centres. The District Education Officer (or a similar high level functionary) could be appointed the in-charge of the centre. The National Level Body would transmit a set of question papers over the NicNet and the district authorities would be instructed at the last moment to pick up any one of them. The whole paper has to be designed in such a way that it could be graded electronically with an optical reader and thus the grading could be done at the State level under the overall control of the National Body. The tests could then be analysed statistically and a reliable, reasonable and robust national bench mark could be obtained. The analysis would also provide an invaluable tool for educational researchers since there could be city, district, state and regional comparisons which could be of immense use to planners and administrators.

Given the enormity of the task involved, the logistical and administrative details of the scheme will obviously need to be planned and worked out in detail. However, it is our contention that with the advances that have been made in information and communications technology, the task is not unmanageable. What is required is the necessary will on the part of the educational planners to implement such a scheme. It is the time we start debating the course our tertiary education is taking if we want to really benefit from the enormous amounts of resources spent on it both by the state and individuals. What is at stake is the future of a whole generation.

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Deteriorating higher education: Heavy price for inaction

It is beyond doubt that the higher education system (the colleges and the universities) has deteriorated considerably in recent times. There are many reasons for this downfall. While most often this downfall has been ascribed to factors outside the given institution itself (like poor funding and the consequent inadequate infrastructure etc.), the impeding factors that originate from within the institution have often not been seriously considered. Bardhan's letter (*Curr. Sci.*, 1997, 72, 689) about situation in universities has brought to focus one such very serious factor that contributes to declining academic standards.

The purpose of a university is not just to teach, examine and award degrees to its students, but to also create new knowledge through research. Theoretically, research continues to be an important component of the university system since all appointments and promotions seem to rely on 'research activity' of the candidate. However, in real practice, this emphasis on 'research activity' is on quantity rather than quality. As a result, we have the most unfortunate situation where majority of university teachers are really not serious researchers and therefore, the exponentially declining rate at which new knowledge is being generated in our universities has not received the alarming attention that it needs. It is just being taken as another 'fact of life'.

One would not agree to Bardhan's sug-

gestion, which has apparently resulted from the anguish and frustration of a sincere person, that those institutions which cannot provide adequate academic ambience, should be debarred from receiving funds for research etc. Actually that would be repeating the same mistake that he has pointed out! Similarly, one would also not like to accept the sincere advice of well-wishers in research institutions to their serious teacher and researcher colleagues in the university system to move to 'better' places. Although such steps may, for the time being, eliminate the source of frustration for sincere teachers and researchers, these will pronounce the death sentence for any academic activity in universities. If the universities and colleges do not function as they should, none of the other research and technological institutions can survive very long.

What is necessary is that the agencies that provide the support and the bodies like UGC, who have to monitor and regulate institutions of higher learning, must not remain mute spectators just because universities etc. are autonomous bodies. A glaring example of the so-called 'autonomy' of colleges and universities can be seen in the 'who cares' attitude of nearly all teaching institutions in our country to UGC's 'directive' of a minimum of 180 teaching days in an academic year. With so many scheduled (and unscheduled) holidays and vacations (and

the additional *sine-die* vacations!), one wonders if any university or college really has a teaching calendar of 180 days. But the UGC has never stepped in to see that its directive is followed or at least some serious attempt is made for its being followed.

All those who are seriously concerned with maintenance and improvement of academic standards and values need to take the issues in right earnest rather than glossing over it because of the 'it does not concern me' attitude! Therefore, it is necessary that more effective and positive monitoring of the academic and other activities of 'autonomous' bodies like universities is practised by the various academies, the funding agencies and the UGC. If they cannot and if the institution itself is not willing to take steps to improve, we may be forced to pay heed to Bardhan's anguished suggestion of total stoppage of research (and other creative) activities and pay a very heavy price for our inaction!

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Microbial pathogens – Identification and surveillance

The 'Plague epidemic of 1994' (*Curr. Sci.*, 1996, 71, 781–808) made an absorbing account of how the etiologic agent of Surat epidemic was finally nailed down by a group of researchers under the able stewardship of V. Ramalingaswami along with inputs from international experts. From this account two inferences can be drawn: one, our expertise in isolation and identification of uncommon/unconventional microbial pathogens is far from satisfactory, a point already well emphasized¹. Secondly, at times, because of a

variety of reasons, unequivocal identification of a microbial pathogen may pose formidable problems even if the pathogen happens to be one discovered long back. Thus, one can very well imagine the problems in isolation and identification of newly emerging or exotic microbial pathogens. I wonder how much expertise our microbiological laboratories have in identification of pathogens like *Leptospira* (causing leptospirosis) and *Burkholderia pseudomallei* (melioidosis), both of which are considered to be emerging pathogens

in India². This applies, as well, to *Yersinia enterocolitica* (gastroenteritis) and *Cryptosporidium* (persistent diarrhoea), both of which are considered to be emerging pathogens in several parts of the world^{3,4}. Thus the need to develop our own laboratories with state-of-the-art facilities for isolation and identification of microbial pathogens cannot be overemphasized. Such facilities will help not only in the isolation and identification of microbial pathogens but also myriads of microorganisms which may have industrial,

agricultural and environmental applications as there is already a lot of excitement about the staggering diversity⁵ of microorganisms. Karl Woese has already predicted that future of microbiology lies in the exploration of its diversity⁶.

A word about surveillance as a means to combat emerging and re-emerging microbial pathogens. It is heartening to know that a National Apical Advisory Committee (NAAC) for National Disease Surveillance and Response System has been established⁷. Apart from epidemiological studies in humans, surveillance of environment would be an integral part of such a programme. The role of changing environment in emerging and re-emerging microbial threats has been emphasized⁸ and in this regard I quote – 'Unlike classical epidemiological focus on attack rates and human populations, understanding emerging infectious diseases will require a broader focus on

ecosystem dynamics, including climate variables, habitat characteristics, and host and vector species populations, aside from human disease parameters⁹'. It is important to emphasize here that surveillance of water and food should be given independent considerations and not as part of the environment as a whole. In support of this argument I would like to mention that an environment surveillance unit was established in 1995, in the Communicable Disease Surveillance Centre (CDSC) by Public Health Laboratory Service under the National Health Scheme of UK for coordinating food, water and the environmental surveillance and for relating these data to reports of human infections¹⁰.

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4. Soave, R., *Clin. Infect. Dis.*, 1995, **21**, 63–64.
5. Service, R. F., *Science*, 1997, **275**, 1740–1742.
6. Woese, C. R., *Microbiol. Rev.*, 1994, **58**, 1–9.
7. Ramalingaswami, V., *Curr. Sci.*, 1996, **71**, 805–806.
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9. Patz, J. A., Epstein, P. R., Burke, T. A. and Balbus, J. M., *JAMA*, 1996, **275**, 217–223.
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Medical research in India

Subbiah Arunachalam (*Curr. Sci.*, 1997, **72**, 912–922) states that medical research in India is not related to the areas of maximum mortality and morbidity. He also states that matching ICMR programmes with the health care delivery objectives of the Department of Health and Family Welfare would be revealing. These statements require critical examination. The author seems to have fallen into the familiar trap set by medicopoliticians who seek to justify the inactivity of the Government in the field of Public Health, by putting the blame on medical researchers.

Mortality and morbidity in India is mostly due to communicable diseases like infectious diseases, diarrhoea, infantile malnutrition, respiratory diseases, tuberculosis and malaria. All these diseases are controllable and have been controlled in many countries by applying the available techniques. Nutrition, food, protected water supply, noncontamination of water sources, drainage and cleanliness in food handling, etc. will wipe away these diseases. No research is needed in these areas to abolish these diseases and reduce morbidity and mortality. What is required

is public, political and administrative action and not research. But to satisfy the political masters – the masters who hold the purse strings of the ICMR – who do not act to prevent these diseases but palm the baby off saying the research is needed, the Council has launched on what is called operational research, e.g. What is the best way of giving vitamin A to the children? What is the best way of swatting a mosquito? Such research undertaken to satisfy the masters who have no political will to control infectious diseases is wasteful and unproductive.

Except in some areas of resurgent malaria and recurrent tuberculosis, research into preventable communicable illnesses is not necessary. Hence we should not fall into this oft-repeated slogan that research in India is not being done in the relevant areas. The same holds good for the control of ophthalmic diseases and blindness. Why not apply the available knowledge and cure glaucoma and blindness instead of asking for research?

It is not fair to compare agricultural research and medical research in India. In medical research in the relevant areas of maximum morbidity and mortality,

knowledge was available and was not applied; whereas in the case of agriculture, a whole vista of new knowledge with relevance to Indian conditions lay waiting to be explored.

The medical research in India has thrown light on many areas like diabetes, cerebro and cardiovascular diseases, special types of cancers peculiar to India and neurosciences.

Valiathan's comment on Indian research, though appearing relevant, is too strong and not applicable at least to medicine. In the surgical field, the difficulty for Indian surgeons to achieve a breakthrough in techniques lies in the fact that there has been no industrial or mechanical backup for any new idea that the Indian surgeon may want to develop. If a surgeon wants to improve or make a new instrument, he just may not have anybody to turn to. The manufacturer wants an assurance from the surgeon that at least 2000 pieces will be sold! This has been my own experience. Luckily Valiathan had the backup of an institution where he could make appliances to his specification and try them out.

Lastly the most important thing in medi-

cal research or any other type of Indian research is that the atmosphere of questioning is lacking from the very beginning of education. When all education is memory-based and questioning by students is positively discouraged from early childhood, how can the country expect researchers to bloom when they enter

universities or research institutions? If there is still so much good research in India, this is despite the system of education and despite the ignorant political masters who have no concept of the importance of research for the overall development of the country in the modern era of science and technology. So after

all Valiathan's statement may have some justification!!

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NEWS

Scientific Advisory Committee to the Cabinet

The Government of India has constituted a 35-member Scientific Advisory Committee to the Cabinet (SAC-C) under the chairmanship of C. N. R. Rao (Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore) with the following terms of reference.

1. Tendering advice on the implementation of Science and Technology policy of Government.
2. Identifying and recommending measures which would enhance the country's technological self-reliance, with particular reference to Government's policy on foreign collaboration and import of technology.
3. Considering policy issues relating to the development and application of Science and Technology which may be referred to it by the Prime Minister or by the Cabinet Committee on Science & Technology.
4. Considering organisation aspects of S&T organisations/institutions, including

measures to provide adequate linkages between the scientific community, educational institutions, R&D establishments, industry and governmental machinery, and 5. Considering – a) filling critical gaps in national competence; b) promoting technical cooperation among developing countries; c) emerging changes from international competitiveness in S&T and also in industry and commerce; d) meeting and anticipating the conflicts that arise in society because of new technologies, and e) other issues concerning science in international relations.

The other members of the committee are: A. K. Basu (Society for Rural Industrialization, Ranchi), V. P. Bhatkar (CDAC, Pune), Asis Datta (JNU, New Delhi), R. Gadagkar (IISc, Bangalore), Ashok Ganguly (ICI, New Delhi), Indira Nath (AIIMS, New Delhi), S. S. Jha (TIFR, Mumbai), Pradip Khandwala (IIM, Ahmedabad), G. Mehta (University of Hyderabad), R. Narasimha (IISc, Banga-

lore), Parvinder Singh (Ranbaxy, New Delhi), S. Ramani (National Centre for Software Technology, Mumbai), M. M. Sharma (University of Mumbai), Bikash Sinha (SINP, Calcutta), K. K. Subramaniam (Centre for Development Studies, Thiruvananthapuram) and Vijay S. Vyas (Institute of Development Studies, Jaipur).

The ex-officio members are: Secretaries to the Departments of Science and Technology, Space, Atomic Energy, Electronics, Ocean Development, Biotechnology, Agricultural Research and Education, Non-Conventional Energy Sources, Scientific and Industrial Research, Industry, Education, Environment and Forests, and Rural Development; Scientific Adviser to Defence Minister; Director-Generals of CSIR, ICAR, ICMR; Secretary, Department of Expenditure; Secretary, Planning Commission; Secretary, Ministry of Welfare; and Secretary (Co-ordination) of Cabinet Secretariat.

Commercial R&D companies to enjoy tax holiday

THROUGH a little-noticed incentive that should attract retired scientists and other technical personnel wishing to cash-in on their experience in R&D, the Union Budget for 1996-97 introduced a provi-

Further details on, and applications for seeking approval of, commercial R&D companies can be had from the Adviser (RDI), Department of Scientific & Industrial Research, Ministry of Science & Technology, Technology Bhavan, New Mehrauli Road, New Delhi 110 016.

sion of a 5-year tax holiday under Sec. 80-1A of Income Tax Act, 1961 to approved companies engaged in scientific and industrial research and development activities on commercial lines. This incentive will be available to any company organized as an industrial-service enterprise that has as its main business objective the provision of scientific and industrial research and development services ('commercial R&D companies').

The tax holiday shall be available to any company, whether new or existing, which is accorded approval by the Prescribed Authority (Secretary, DSIR) at any time before 1 April 1998. The 100% deduction for a 5-year period shall commence from the assessment year relevant to the previous year in which the approval by the prescribed authority is accorded to such a company. The above provision took effect on 1 April 1997 and will,