

Do you have it in you!

Knowledge is power, and knowledge without fruitful action is a waste. This waste is very much visible in our universities and colleges as far as the output in the field of research is concerned. Doctorates are being given to several undeserving candidates, which has led to the UGC to institute NET examinations. A number of students register for PhD simply because one has to get engaged in some work; they do not have any real interest in pursuing research. Many persons take up jobs totally unrelated with the work they had done during their doctorates, like teaching in primary schools or doing MBA after/during their PhD in biological or chemical sciences and later working as a Marketing Executive. Ultimately it is our country that is at the losing end and also those genuine students who could not pursue research due to limited seats in the universities.

Our system of selection of SRFs, JRFs, PFs, etc. is also so transparent that, weeks before the interview people know who is going to be selected! This is a

wrong practice prevailing in universities and should be stopped at once. This really disheartens some good students who do not get selected.

The aim of the government to fund various departments of universities and colleges with project grants is not only to take India into the research map of the world, but also to develop good scientists who can make the future scientific community stronger. We are having thousands of projects running in several universities worth millions of rupees of hard earned taxpayers' money. Still our output from these institutions is far from satisfactory.

My suggestion is that we should have a *psychological test* for persons who are interested in the (very demanding) field of research. Whether a candidate possesses the aptitude for being a scientist or a researcher has to be tested. Although this criterion is taken care of while appointing research scholars in national laboratories, this is not the case in universities where there are more aspirants.

As we test the knowledge of our post-graduates through NET and GATE examinations, it is also very essential to test their aptitude, whether they are self-motivated, whether they can cope with the highs and lows of this field and whether they can adjust themselves to the rigorous work which they have to do after joining any laboratory.

My appeal to all candidates aspiring to be responsible scientists/researchers is that they should test, on their own, the ability to do research, till this system is adapted, since there is no point wasting their valuable time and energy, if they lack such an aptitude. Similar to the popular slogan of the defence forces, we should also first ask persons joining research *Do you have it in you*.

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Mind-brain interaction

Being an admirer of P. Balaram for the high standard of editorials in *Current Science*, I must observe that the column entitled 'The recesses of the mind'¹ was rather disappointing; a conclusion which might be ascribed to my own personal prejudices² in these directions.

The editorial deals with the life and unique achievements of John Nash, a genius mathematician, who was awarded the doctorate degree of the Princeton University in 1950 on the basis of a brilliant dissertation of merely 29 pages. Although his contributions in the field of 'The bargaining problem' and 'The modern game theory' might not have excited the mathematicians, these signalled the beginning of a new approach to economic analysis as well as such other diverse directions as 'evolutionary stable strategy' in biology. However, Nash was

unfortunately soon crippled with schizophrenia, leading him to 'slide from eccentricity to madness'.

In spite of the sad development, he was chosen for the Nobel Memorial Prize for Economics in 1994, although being aware of his paranoid condition 'one of Nash's colleagues at Princeton was forewarned to prepare both the recipient and his surroundings for the inevitable gaze of publicity...'.³

Obviously as usual, Balaram has been eminently successful in projecting an unbelievably gripping tale, but the analysis in the last few paragraphs appears to lack his usual clarity of thought and reasoning while dealing with mind-brain differentiation.

In spite of extraordinary revelations during the 'decade of the brain' (1900–2000), knowledge about the functioning

of the brain is still amateurish. Although the topic has been dealt with in great detail by mathematicians like Penrose^{3,4}, even the existence of a 'mind with consciousness', distinct from the brain is not universally accepted. During the last few years, a phenomenal amount of new light has been thrown on the functioning of the brain through its different compartments (e.g. the work on Einstein's brain⁵ at the McMaster University, Canada).

Let me end with a quotation from Roger W. Sperry⁶ (1981 Nobel Prize winner in Physiology and Medicine for his discoveries concerning the functional specialization of the cerebral hemispheres), who in search for a more satisfying answer to the age old mind-body problem states: 'The new reasoning does not change older assumptions regarding the chain of causation at neurocellular

levels in the brain. In cognitive processing, however, these neurocellular events are seen to be enveloped within and thus controlled by high level types of causal phenomena...'

1. Balaram, P., *Curr. Sci.*, 2002, **82**, 1065–1066.
2. Mehrotra, R. C., Kothari Memorial Lecture on Mind–Brain Interactions (1999) in

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3. Penrose, R., *Shadows of the Mind*, Vintage, 1995.
4. Penrose, R., *The Emperor's New Mind*, Oxford University Press, Oxford, 1989, and with a new Foreword, 1999.
5. Witelson, S. F., Kigar, D. L. and Harvey, T., *Lancet*, 1999, **353**, 2149.
6. Sperry, R. W., in *Cosmic Beginnings and Human Ends* (eds Mathews, C. N. and

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Recesses of the mind

The editorial 'The recesses of the mind' (*Curr. Sci.*, 2002, **82**, 1065–1066), highlights the important issue of mental illness.

The moving story of the achievements and the illness of John F. Nash Ph D, appeared in *The New York Times* (13 November 1994, Section 3, p. 1) before the appearance of 'A Beautiful Mind' under the caption 'The lost years of a Nobel Laureate'. Nash (now 73) received the Nobel Prize in Economics in his 66th year (1994) for the work on game theory carried out by him in his 20s. In his 30s he fell a victim to a severe type of 'paranoid schizophrenia' and spent the next twenty five years undergoing treatment as an inpatient and outpatient in hospitals, with medication and psychotherapy. He had fearful delusions and disordered thinking. 'A mute figure who scribbled strange equations on black-boards and searched anxiously for secret messages in numbers!'. He heard 'voices' – hallucinations periodically. Around his fiftieth year, he came out of schizophrenia and started to work on computers in ingenious ways – a remarkable sign of recovery. He did not publish any scientific paper after 1958 nor did he hold any

academic post after 1959, indicating thereby a lack of creativity during the years of illness. The most significant contributor for his recovery was the immense psycho-social support he received from his wife and friends.

The narration on Nash has important messages: (i) Intensive treatment, including family care towards recovery; (ii) A number of clinical researchers who have followed patients with schizophrenia have observed that 20–35% of them achieve a good quality remission even after decades of severe illness; (iii) The stigma of mental illness did not deter the Nobel Committee from their final decision. Nash was among the living Nobel Laureates who participated in the Centenary of the Nobel Foundation in December 2001.

The statement in the editorial that 'schizophrenia is an affliction that may defy our understanding for some time to come' is indeed true. Schizophrenia like the proverbial Sphinx poses more questions than can be answered.

The German psychiatrist Emil Kraepelin developed the concept of this illness from 1883 and it was in his *Compendium of Psychiatry* (1899 6th edn) that he used

the term 'dementia praecox'. Later the Zurich psychiatrist Eugen Bleuler rechristened the illness as 'schizophrenia' (1908). However the first use of the word 'dementia praecox' was by Morel, the French psychiatrist.

Recent genetic research on schizophrenia has highlighted the interaction between the gene and the environment. The schizophrenia gene is a necessary cause but not a sufficient one. The latter comes from the environment. In the absence of the gene, the disease is unlikely to occur. Nasar's book discusses that Johnny, the son of Nash, also suffers from schizophrenia.

Creativity, indeed is a complex subject that is being debated. Creativity is more evident in patients with 'mood disorders' than schizophrenia and manifests in spite of mental illness.

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Spirit of scientific innovation in India

Science is the key to salvation for the poor nations¹. It has been a liberating force in ancient India² upon which the foundation of modern science rests^{2–4}. We are a nation of one billion people.

Performance of science in India has been spectacular in several fields^{1–4}, but we also have problems; fortunately these can be corrected. I propose to make a case here that the only way to correct the

situation and thereby be a leading nation is by taking measures to cultivate the spirit of innovation in children. This can bring an innovative wave of science in India over the next 25 years.