Hence I subscribe enthusiastically to your editorial's last paragraph: 'it *will* enrich the Indian scientific scene'. But I add to your need for 'imagination and drive' the willingness to change. Perhaps Indian science could learn the lesson (totally ignored by post World War II American science), which Albert Einstein put to a Caltech adulatory crowd in 1931: 'It is not enough that you should understand about applied science in order that your work may increase man's blessings. Concern for man himself and his fate must always form the chief interest of all technical endeavors, concern for the great unsolved problems of the organization of labor and the distribution of goods – in order that the creations of our minds shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations.'

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Flawed policy of DST and DoE

I wish to state that the statement about DST imposing two draconian conditions on S&T projects submitted to them is not true (P. N. Andhare, *Curr. Sci.*, 1997, **72**, 158–159). As far as support for basic Science and Engineering Research is concerned, the scientific merit is the only ground on which funds are provided. Only on projects of applied nature, it is the policy to nurture linkages between research community and industry, and preference is given to projects involving industrial participation. During the year 1995–96, Science and Engineering Research Council has supported over 300 projects and spent Rs 37 crores approximately and scientific merit has been the only criterion in supporting these projects.

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P. N. Andhare accuses the DST and DoE of imposing 'draconian conditions that they nip in the bud *any* S&T proposal even before its evaluation on scientific merit' (emphasis added). The two conditions are (paraphrasing) (i) every proposal must have financial support from industry, and (ii) industry must give an undertaking in advance to productionize the R&D resulting from the proposal. In my capacity as the Chairman of the Programme Advisory Committee on Robotics and Manufacturing of the Department of Science and Technology, I would like to make it clear that the above-stated requirements are *not* preconditions for a proposal to be funded by DST.

Let me begin by giving a few statistics: The PAC-RM (and its predecessor, the PAC on Manufacturing Technology) have over the years made it a policy to nurture interaction between the research community and industry. Since 1991, the PAC has funded (after approval by SERC) a total of 39 projects at an outlay of Rs 512 lakhs. Of these, 18 projects have received partial funding from industry and other agencies to the tune of Rs 178 lakhs. Thus, the industrial support has been approximately one-third of the total funding. On the other hand, it can be seen that the majority of projects funded by PAC-RM have *not* received any industrial funding. Thus, Andhare is not correct in stating that 'any' project must have industrial funding in order to be considered. The statistics above (from a PAC that is among the most 'practical' in DST) bear this out.

Speaking as an individual, I would say that in order to qualify for funding, a research project must *either* consist of top-quality basic research, *or* address a problem of relevance to industry. In the former case, the criteria for assessing a project are the familiar ones, namely the past record of the researchers, the likelihood of the outcome of the research being published in top-quality journals, and so on. In the latter case, a major criterion for judging the relevance of a project to Indian industry must surely be the willingness of the industry to underwrite the cost of the project. There is nothing unreasonable about this criterion.

Unfortunately what happens far too often in our country is that people try to pass off as 'practical' projects whose only notable feature is a total absence of any novel theoretical ideas. Thus the operative presumptions seems to be that if a project will not contribute to basic research, it must therefore be deemed to be 'practical'. In such situations, I see nothing wrong in calling the bluff of such proposers by asking them which industry is interested in their work, and why such industries are not paying at least a part of the cost of the project.

Let me repeat that if a person is doing basic research work at an internationally competitive level, then industrial participation is not called for at all. On the other hand, stringent steps must be taken to guard against persons trying to pass off third-rate theoretical or 'applied' work as 'practical' R&D.

Finally, I cannot agree with Andhare's railing against 'market' forces in S&T. Whether he acknowledges it or not, there are *always* 'market' forces at work in every arena, not excepting S&T. Even carrying out 'basic' research is subject to 'market' forces. Why else do new ideas suddenly become 'hot' while others becomes 'cold', even in purely theoretical subjects such as mathematics? In order to publish a paper, even in purely theoretical subjects, it is necessary to make a substantial contribution *on a topic in which the research community is interested*. No journal will publish a paper on a topic that is deemed by the community to be outdated or not of interest to anyone. Unfortunately what some persons want in our country is not academic freedom, but rather freedom from accountability. But that would be licence and not freedom.

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