will expand the endless frontier), encouragement of the formation of sound science-based companies; reconstitution of management priorities, promotion of industry–university partnerships; exchange of talent between universities and industry for specified durations and tasks, reconfiguration of the university system with focus on 'science for society', requirement for scientists and their students to devote some part of their time, *pro bono*, to general education in the sciences, commitment to free flow of information. The authors suggest that the sum spent on basic research should be considered an overhead for an enlightened society. Even so, they suggest revision of the procedures for federal grants such as to count the value of scientific work done by citations from select 'professionally excellent' journals, award funds on the basis of past performance and not the size of the proposal and make all awards relatively long-term (3–5 years).

The essay is unfair in its assessment of the value of actual achievements in basic and applied science. The essay does not recognize, for example, that the leadtime between a 'discovery' or 'invention' and its commercial use had begun to shorten (much less than the 30 years mentioned) by the eighties and that the compulsions of international competition have ushered in the directional change which the authors urge.

Developments in the last decade have validated the Shapley–Roy criticism. In a 1984 essay 'The value of fundamental science' (*Sci Am.*, **251**, November 1984), the Nobel Laureate Leon Lederman, mentioning several instances of how fundamental science directly contributes to commercial opportunities for public benefit (with many more potentially valuable leads), suggests a classification of priorities that clearly covers Shapley–Roy concerns. First, identify the fields of science that are the most remote from application and deserve to be called fundamental; secondly, trace the ongoing efforts in fundamental science discipline-by-discipline in order to show explicitly the connections between laboratory and industry and assess the performance of the industrial follow-up; thirdly, estimate the contribution made by fundamental science to the education of people 'needed by technology and the more applied sciences'. More recently, in a profile of the new Science Adviser (John Gibbons) to the US President (*Sci. Am.*, **268**, April 1993), John Horgan quotes Gibbons: 'some scientific fields, notably particle physics, have grown much faster than the overall economy ... That is known as a divergent series ... seems to me indefensible that science should have a rate of growth of support that is multiples of the growth of our resources'.

The directional change in funding thus started almost synchronously with the publication of the book. In recent years, cooperative research and development by otherwise competing firms in pursuit of a shared vision is being attempted. Federal funding is no longer married to their 'basic research is the best' philosophy. Industry–academia relationships in general have been expanded. The 'supercollider' project has been virtually given up, projects such as the trip to Mars are on the back-burner and the move is on to promote internationally shared costs in basic research, much on the lines of the European CERN.

The Indian context

The relevance of the theme to the current situation in India is probably self-evident, regardless of whether one agrees with the metaphor of separate trees (p. 20) of basic science and applied science and engineering or not. Although the national environment in the US in 1985 was different from the situation in India today, the cause–effect linkage is relevant. The theme is pertinent to the current debate (in the hospitable columns of *Current Science*) on S&T policy-making, standards in scientific education, and the state of scientific research in India. The lack of synergy between scientific research and industry and the nonparticipation of science institutes in graduate education are also the results of a somewhat similar mindset. In fact, the invited responses reproduced as Appendices are themselves rich in relevance – some vintage 'truths': 'organize science and engineering as a systems continuum, joining basic research to applications and engineering' (William Baker, ex-Chairman, Bell Laboratories), creativity is 'competence to transfer the common denominator in all honestly pursued research from one field to an entirely different one' and age is no barrier to creativity if people make 'the centre of their life the intellectual life of the laboratory' (and not seeking dignity through pursuit of power over people) (Edwin Land, ex-Chairman, Polaroid)

One element not referred to in the Shapley–Roy essay is the motivational aspect of national or industry policies in S&T. In the context of their essay, the issue of how a large growing population of science-educated students (as in India) could be motivated first to seek an S&T career and thereafter to strive for excellence in their chosen area was not of immediate relevance to them.

Overall, an excellent piece of constructive criticism. Recommended reading for policy-makers and serious thinkers on the future of S&T in India.

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Stereochemistry of Organic Compounds – Principles and Applications (second edition). D Nasipuri. Wiley Eastern Limited, New Delhi. Price. Rs 200/-.

Barring a few who are working in research areas steeped in stereochemistry, a majority of teachers and students treat this subject as a maze and a necessary evil. On second thoughts, this should sound unnatural, for we live in a three-dimensional world and feel the stereo-differentiation in our day-to-day lives. The problem is probably in the way we start teaching chemistry. At the formative levels, we introduce the subjects in a two-dimensional format and at a later stage we develop the third dimension. The problem has been further complicated by the lack of an authoritative text book for teachers for introducing the subject in the correct perspective. The book by E. Eliel served this purpose admirably from the college level onwards up to the level of advanced students in stereochemistry. This vast range had made the volume a treatise for intense reading. On the other hand, a general text book on organic chemistry finds limited space to do proper justification at an introductory level. An authoritative book bridging the gap has been long overdue. This volume by

Prof D Nasipuri attempts to fill the gap.

In the book under review, the nightmare called 'nomenclature in stereochemistry of carbon compounds' has been mercifully simplified with the newer approach now available. The conformation of acyclic and cyclic compounds has been treated sufficiently in detail to be of value to graduate students and teachers. The classical treatment on conformation and reactivity has been dealt with proper examples and illustrations. The author has done well to start the comparatively modern topic of stereodifferentiation reactions with definitions and has followed it up with detailed discussions. Students would find these discussions useful before proceeding to the advanced treatise. The inclusion of pericyclic reactions as a chapter in a book on stereochemistry could be debated. But there could be no doubt on the chapter on molecular recognition. This is a welcome addition which brings in new vistas. The topic is a newly emerging frontier in stereochemistry and chemical reactivity, which attempts to unfold the reactivity of mystic enzymes and factors relating to gene recognition. The concepts on conformation get expanded to larger conformational space in this treatment. The scope of this new frontier has been delineated very well.

Though the discussions throughout the text have been well illustrated, the illustrations are crowded and the print types chosen do not always bring out the desired contrasts. These are, of course, minor aberrations on a masterly written text book on stereochemistry. The undergraduate and graduate students throughout the world would welcome this book.

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