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EDITORIAL

A foundation for science

Scientific research in its most fundamental form is practiced in Universities and academic institutions. At its best, research in academia is unfettered by the need to demonstrate instant utility, allowing scientists to follow their instincts in choosing problems for attack at the frontiers of their disciplines. At its worst, research in Universities is unpurposeful, undirected and largely driven by the need of students to acquire Ph D degrees, working ostensibly under 'guides' who show little interest in their progress. Academic science covers an extraordinarily wide spectrum of activity ranging from work at the cutting edge of contemporary research to purely routine, pedestrian activity, which nevertheless, serves the useful function of acting as the training ground for the scientists of tomorrow. Academic science forms the foundation of the scientific enterprise, indeed no 'useful, new science' will emerge without a wide base of basic science. Few will deny the importance of fostering the practice of science in academia. But, it appears that science departments in academic institutions across the country are facing a crisis, with both financial resources and quality manpower declining at a steady rate. Research, today, requires a substantial infrastructure, with most areas of science requiring access to sophisticated instrumentation, well endowed laboratories and significant budget for consumables. Most importantly, the pace of progress has been so fast that expensive instrumentation needs to be frequently upgraded. Maintenance costs are also mounting at an alarming rate. It is no longer easy or even possible to practice meaningful science on shoestring budgets.

Looking back at the structure for funding scientific activity in India, it comes as a surprise to many to realize that major initiatives for funding science at Universities are only a quarter of a century old. The Department of Science and Technology (DST) provided the first major thrust for funding individual investigator driven grants in the mid-1970s and raised the level of its activity very substantially in the 1980s. The Science and Engineering Research Council (SERC) of the DST served as the focus for supporting academic science. Much of the heightened activity at academic institutions (and national laboratories) across the country in the 1980s and 1990s was the consequence of the enthusiasm for science at the agencies and the infusion of funds by the DST, the Department of Biotechnology (DBT) and the Council of Scientific and Industrial Research (CSIR). But, in the last few years there has been a decisive change in the mood at the agencies. Building infrastructure for academic science and promoting individual driven projects are no longer a high priority. The torch has passed to those who champion the cause of 'applied science'; the projects that find favour today are usually large coordinated exercises, which invariably promise some remarkable outcome. Genomics, smart materials, vaccines and even a mission to the moon are talked about; it is fashionable to be mindlessly optimistic about the possibilities for success in technologically advanced areas. The commercial successes in the 'information technology' area appear to have convinced many that miracles are around the corner in the other fields of science and technology in India. The pessimists, largely silent, are being relegated to the fringe; not many policy makers today, like to be told that the fabric of fundamental science in India is dangerously stretched and needs attention.

Even at the best of our academic institutions, research facilities are meager as compared to Western laboratories, with which we often imagine that we compete. Even as a training ground for scientists, our Universities are poorly equipped in terms of equipment, facilities and people. These laboratories can hardly provide an adequate introduction to the many areas of advanced research, in which trained persons need to be generated for many other sectors of our science and technology establishment. Clearly recognizing the importance of shoring up academic science, countries like Canada, China, Japan and the UK have introduced new, innovative schemes for refurbishing and restaffing the institu-

tions charged with the mandate for developing basic science. In India however, no worthwhile initiative that will make a substantial difference is even being contemplated. In new programs for infrastructure building like FIST, DST's newest venture, the financial inputs are meagre enough to ensure that the effort will only be a token of our commitment to basic science. The major funding agencies have become enmeshed in an ever-widening circle of activities that have steadily diluted their commitment to funding 'small science'. Unfortunately, even 'small science' today, needs appreciable resource inputs.

Is there any hope of separating the needs of basic academic science from the requirements of clearly applicable, target driven science? One possibility is to resurrect an old idea that it may be worthwhile to establish a National Science Board (or Foundation) along the lines of the US National Science Foundation. Such a body would be clearly charged with the responsibility of fostering science in academia, without being shy of supporting apparently 'inapplicable research'. In principle, a foundation could operate by generating a corpus from both Government and private sources. An autonomous body, with full financial flexibility, operating outside a ministerial structure (and possibly away from Delhi, in a manner reminiscent of the Atomic Energy and Space Commissions) may provide a much needed transfusion of funds and enthusiasm to our academic institutions. There are also many lessons to be learnt from the growing influence of private foundations on the conduct of academic science in the West. For those who like to think in concrete terms, a reasonable difference may be made only if sums of about Rs 100–200 crores per year are additionally directed into the academic science sector. Only then will access to instrumentation and good laboratory facilities increase in a substantial manner across the country. Where will this money come from? Those who pore over the annual Central budget figures may soon realize that this may not be an impossibly large figure. Unfortunately, basic science does not have many lobbyists in the corridors of power. Private initiatives have also been completely lacking.

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