

sunset brimming with knowledge at the end of the day. It never happened.

Then the next question was about how the performance should be marked. In fact, the most important concern for the students and postdocs alike was the marking. One extreme suggestion was that it would be only fair if all of them presented the same paper for 15 min each and the presentations were marked accordingly. Is it the fault of the student if he/she does not choose a good paper? Fortunately some of the students took a position that listening once is bad enough but to listen to the same stuff 15 times would be more than what their fragile nerves could bear! By this time, the pervading influence of catatonic stupor, so diagnostic of 'seminaritis', is realized by every student. That, in itself, was an achievement.

Another suggestion was that one should take a few classes on how to give a scientific talk, and how to break-up the talk. This has brought us back to the earlier courses on scientific writing which were given up for the simple reason that they did not make any difference to the students.

What is being scientific? There was no agreement nor was there a consensus on who is best qualified to say so. The only way to resolve the problem was to argue that a seminar has something to do with a group of people discussing it.

Any goal that is not taken explicitly into account activity by the group has no value in a seminar. Marking, learning, knowledge acquisition, being scientific, etc. all went through the window since they could not be defined as an obligatory 'group' activity.

The discussion was not getting anywhere as the students claimed that they were confused. The postdocs, on the other hand, were convinced that the matter was really clear and that there was no need for discussions. When the choice of papers and structuring came up, it was suggested that even the daily practicals could be taken up as seminars since a lot of detail could be discussed. The practicals are actually supposed to have a large slot for discussion of results, right and wrong, which obviously was not being utilized. The students decided that we will not discuss the practicals during the seminars.

The follow-up took place by individual discussions with the students. The students who opened up privately were clear that they did not want to trouble their classmates and therefore did not ask questions. Politeness has a stranglehold on the students; no one wanted to inconvenience others, such that the whole seminar course died that year. They themselves knew what they were doing. Also it was clear that 50% of the class was very Sicilian in their outlook,

observing Omerta (silence) as sacred. Classes were merely a spectator sport, not to indulge is recklessly by actually participating.

Two weeks following these arguments with all the students, the first seminar was given by a first year student as part of the seminar course. The paper was from *Current Science*. Strangely, nearly every one argued their heads off. A major argument was, how can these authors jump from circular dichroism data to Alzheimer's? Would that be correct to extrapolate? Can conclusions be reached? Is that being scientific? Which is better, to jump to a conclusion or to withhold a judgement or conclusion? Debate raged. I kept quiet (There is merit in the observation of Ernest Hemingway that only a fool looks for the beginning and the end in the same story). We do not know why these discussions took off. It did not recur too often subsequently. My idea that all the students should read the paper before coming to a seminar so that anyone may be asked to present randomly was however vetoed by the entire department unanimously.

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The wrong policy at the right time

In the era of globalization and free market economy the country is in need of development of indigenous technology which would benefit and promote symbiotic growth with the industries. The need of the hour is therefore to develop technology that is cost effective, competitive and global. This requires dedicated efforts from the scientists and technocrats of the nation to work together. The government policy in this regard should be to encourage highly funded R&D institutes such as IITs to come forward with new ideologies. Needless to say, the stress should be on experimental research rather than incremental theoretical research that can only benefit the developed nations.

Unfortunately, the focus on experimental research at the IITs is on the decline. The reasons for this are many. The primary one is the lack of an adequate and supporting environment conducive to experimental research. The researcher has to overcome a number of physical and administrative hurdles. The sophisticated testing equipments are not properly maintained and also not operated to their capacity. The lack of work culture among the supporting staff, non availability of consumables, spare parts of the sophisticated equipment and the general administrative apathy often make these instruments inoperative for several months. An avid researcher who waits for months to even

carry out the preliminary tests or measurements on his samples under these circumstances gets demoralized and demotivated to proceed further. This results in a shift of focus among the researchers from experimental to theoretical pursuits. This shift in the research orientation is palpable among the scientific community in India. Moreover, such shifts get reinforced by the lack of research students with good experimental skill who would not be tempted by the relative ease of conducting theoretical research in this information age!

The problems get compounded because of the diverse facilities offered to the young researchers at the various

IITs and other government-sponsored research institutes. This confuses the young minds and influences them to seek research opportunities only in specific institutes. This causes an artificial competition between the said organizations. As a policy, the facilities available to the research students in all these organizations should be uniform and realistic. For example, in IIT Kharagpur, with the academic registration fees spiraling upwards, and the mess bills and maintenance fee ever rising, the students here even have to bear the added burden of paying for every single use of the in-house sophisticated instruments. These conditions are not so serious in other

institutes/organizations. The fallacy is that almost all of these sophisticated instruments have been purchased with assistance/funding from HRD/MHRD/DST/CSIR, etc. and the aim of these funding/grants in these premium institutes is for manpower training. When students instead of getting trained in the operation of these equipment get away by just paying for testing or measurement charges, then the original goal of their purchase itself gets marred and defeated! If this policy remains, then we will soon be left only with a virtually crippled scientific community who would fear the thought of instrument fabrication and we would be slaves to

the multinational instrument industry forever. A big mistake is being done to earn trivial revenue in comparison to the huge investment, only to follow the system of developed countries.

It is high time the policy makers focussed their attention towards the nourishment of experimental research in India and become efficient in the world market.

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The Indian Science Congress: Kumbh mela or an effective forum for Science & Technology

The rather hesitating final support for continuance of Indian Science Congress sessions by H. S. Virk¹, after comparing the same with the Kumbh mela does not recognize the unique success attained under the leadership of R. L. Mashelkar by the Pune (2000) Science Congress in (i) projecting in an effective manner the current frontier areas like bioinformatics, information technology, communication, genetic control, patenting problems and societal impact of science, as well as (ii) bringing about a remarkably close interaction between young and mature students of science during the session. These types of unprecedented achievements have been better reflected in a brief note by Rajendra Prabhu².

Started in 1914 on the pattern of the British Association of Science, the ISCA had tended to assume the status and role of a Magh mela of scientists. There has, however, been a distinct improvement since the introduction of the idea of a Focal Theme in 1976 by Swaminathan and the institution of a Task Force at the suggestion of Mehrotra by the DST since 1980, to follow up the recommendations of the focal theme. Unfortunately the functioning of this Task Force is no longer receiving the attention it deserves and requires much more serious effort(s) and sustained follow-up action.

Hopefully, the high standards of scientific discussions involving top leaders and the young learners, set up by the Congress in 2000 would be maintained in forthcoming sessions. Simultaneously, greater attention to well-thought out recommendations emanating from such a huge body of scientists should result, through concerted efforts of the Task Force, in a closer interaction amongst scientists, society and the governmental agencies.

Further, sustained and well-planned efforts for clearer understanding with the print as well as electronic media from well before till after the actual session should be an effective force for creation of scientific temper amongst the general public, scientists and policy makers – a dream with which ISCA was nurtured by persons like Jawaharlal Nehru.

In the above task of popularization of science, the ISCA secretariat under the overall guidance of the President and the Honorary Secretaries should play an active role with steps like: (i) Publication of the autumn (September) issue of *Everyman's Science* with short biographies including photographs of the General and Sectional Presidents (preferably with a brief account of their plan); (ii) Securing brief synopses of invited and special/popular lectures at the general and sectional sessions and distributing them well in time for use by the print as

well as electronic media; (iii) Developing an efficient distribution mechanism of the above materials; (iv) Activizing ISCA Regional Chapters in these directions.

In order to convince that the above suggestions are not merely theoretical, the writer of this note may be excused for citing (with utmost humility) that in his capacity as Assistant Local Secretary of the ISCA session held at Allahabad in January 1949, he could (i) publish the biographies of K. S. Krishnan and others in all the local as well as many national dailies and magazines coupled with (ii) half an hour's broadcast daily in both Hindi/English at the All India Radio immediately after the News. In retrospect, it may be of some amusing interest that in these efforts, the author was motivated primarily to earn sufficient money to repay the loan (which as a teacher with extremely low salary), he had taken for the expenses of preparation and submission of his D Phil thesis in October 1948.

1. Virk, H. S., *Curr. Sci.*, 2000, **78**, 1052.
2. Prabhu, R., *National Herald*, 19 March 2000.

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