With the recent reorganization of Current Science we are introducing a section called 'News from Delhi', which will have, among others, articles and discussions about our Ministries, Departments, Commissions, etc. that deal with science and technology and about bodies that advise Government on matters scientific. The deliberations and advice of these organizations often end in governmental decisions that profoundly affect science and scientists in India. It is therefore vital that the scientists, who are really at the receiving end and who in the final analysis contribute to the growth of science, should know what these bodies are, what they do, and how and why decisions are taken. It is not uncommon to read in the newspapers that strong differences exist between these organizations. The media also have a tendency to sensationalize these differences. The scientific community is often baffled and sometimes embarrassed by these reports of divergence of views and is not able to grasp what the real issues are. Hence taking the scientists into confidence is an all-important step in the process of building up good science in the country.

In this context it gives us great pleasure to publish an article that tells us about the Science Advisory Council to the Prime Minister (SAC-PM) and its activities—an 'insider's view', as the author, Dr P. J. Lavakare, the Secretary to the Council, states. We hope this will help foster real communication between policy makers, science executives and working scientists.

—Editor

SCIENCE ADVISORY COUNCIL TO THE PRIME MINISTER—A BRIEF OVERVIEW

P. J. LAVAKARE
Secretary, Science Advisory Council to the Prime Minister, New Delhi.

Introduction

As a unique experiment, in February 1986, the Prime Minister appointed a Council of independent science advisors with fairly broad terms of reference. The Council was to advise the Prime Minister on:

a) major issues facing science and technology today;
b) the health of science and technology in the country and the direction in which it should move; and
c) a perspective plan for 2001 AD.

The Council was also to look at specific problems with different scientific departments, policies, priorities for research and technology missions, etc.

Unlike earlier approaches to setting up advisory committees, in which they mainly consisted of Government representatives from scientific departments and some individual scientists belonging to academies and major research institutes, the Science Advisory Council to the Prime Minister (SAC-PM) consists of a wide spectrum of individuals, including representatives from multinational companies, a few specialists in their individual capacity, and a Chairman who is not part of the Government machinery. At the outset, this combination of people, most of whom had not even interacted with each other before, looked certainly odd and attracted subdued criticism from members of the well-established scientific community. After a period of three years of functioning, it appears, at least to some of us, that the diversity of the group and their non-attachment to Government machinery have proved to be a source of strength in the form of innovative approaches and bold recommendations, which have arisen, not out of any personal interests, but with a perspective and with the main objective of using science and technology for national development. The following sections describe briefly (no doubt an insider's view) some of the activities of the Council over the last three years since its inception. This overview, to a certain extent, is also

self-critical, and the fact that it is openly published confirms the approach that the Council is adopting in its deliberations. The overview describes some of the Council's activities over the last three years and its strategy for the next year, at the end of which its present term would expire. Through such a review the Council expects that it will provide its members an opportunity to focus their deliberations, during the last year of its term, on some specific issues that have not yet been resolved in terms of concrete implementation of their recommendations over the last three years. It will also use this opportunity to take up issues that it has not had the time to discuss so far, though they form part of the Council's terms of reference.

The Council has always recognized that the very advisory nature of its functioning is an indication that not all aspects of its recommendations may be implemented, particularly when the recommendations would demand major change in the existing system and since the recommendations to the Government are from a body that is outside the existing organizational framework. This limitation has not deterred the Council from taking up major issues that may cut across not only all the sectors of science and technology, but also those that affect the socioeconomic development of the country in a major way. Its deliberations have also come up with major recommendations, some of which have been resisted sternly by the existing Government machinery. The Council has always based its deliberations and recommendations on the fact that its main function is to provide independent advice to the Prime Minister on issues that are either already being dealt with within the Government system or on issues that need to be introduced in the normal functioning within the Government framework. Through the deliberations of the Council the members have, on several occasions, met the Prime Minister in formal and informal sessions and these sessions have often resulted in a closer understanding of the functioning of the Council based on the advice given by the Prime Minister. The Empowered Group, specially set up for considering the recommendations of the Council and consisting of Secretaries to the Government of India and chaired by the Cabinet Secretary, has deliberated on several recommendations sent to the Prime Minister and through such deliberations several of the recommendations of the Council have been incorporated in the Government's functioning, as would be indicated in subsequent paragraphs.

In addition to the approach of giving advice on matters referred to it by the Prime Minister, the Council, on its own, has taken several initiatives, within the framework of its terms of reference, and brought to the attention of the Prime Minister major issues related to science, technology and development. These include highlighting the development of priority areas (e.g. robotics, minerals development, advanced materials, parallel computing, lasers, photonics, chemical industry, agriculture, fertilizers, etc.) and suggesting specific action plans for developing these areas in the national framework. These initiatives of the Council have been, by and large, appreciated and the members of the scientific community have come forth, in a major way, to assist the Council in its deliberations on those issues where a wider expertise from the scientific community was utilized in the form of working groups and expert panels. In all these recommendations the Council's focus has been to come up with specific action plans so that 'things would happen' in the Government framework rather than expound on the elaborate technical details. It may be worthwhile to briefly describe how the Council functions in order to arrive at its recommendations.

How the Council functions

In view of the fact that the Council's members come from different backgrounds and have not always been in a position to interact on a day-to-day basis through normal governmental committee structures, one of the salient principles of the Council has been to organize its meetings on a very regular basis, with advance planning and ensuring a high rate of attendance by the members. The Secretariat of the Council has always been kept on its toes so as to make advance plans for its meetings, prepare well-focused agenda, and do quick follow-up of actions on the recommendations made by the Council. The Council has maintained a steady frequency of roughly one meeting per month and, as a result, has had 38 meetings over the first three years of its functioning. The emphasis at these meetings has always been to keep an atmosphere of informality and brevity, but at the same time, a well-defined focus on the issues involved and the specific recommendations that could emerge. Individual members, assisted by members of the scientific community, have separately provided inputs in the form of working group reports on various issues discussed by the Council.

Right from the beginning, the Council has been concerned about interacting with a wider cross-section of the scientific community and getting independent views from different cross-sections of the society. It had planned to hold these meetings in different parts of the country, but in spite of its conscious efforts, it has not been able to avoid having Delhi as its venue for 21 of its 38 meetings. The other meetings have been held in institutions located in Bombay, Goa, Hyderabad, Bangalore, Madras and Calcutta. It has not yet had an opportunity to hold its meetings in the north-east region of the country, where the problems of development have a unique character. The Council is very conscious of this lacuna and is hoping to make up for this in planning its future meetings. It is also conscious of the fact that, while these meetings are held in different locations, it would have to give more time to members of the scientific community for informal discussions and to obtain inputs that may be of relevance to its deliberations. In addition to the meetings of its own, the Council has met the Prime Minister on several occasions. All the meetings with the Prime Minister have given a great sense of satisfaction to the members as well as to the Secretariat, because these meetings also maintained an informal and frank atmosphere of discussions based on specific agenda items and were not bogged down by procedural matters and with issues connected with formalities. The Council has always made it a point to prepare for meetings with the Prime Minister in great depth, and the scientific and technical spirit with which an issue is to be presented is well rehearsed and clear-cut responsibilities identified for making audio-visual presentations to the Prime Minister. This has avoided dependence on bulky documents, except when detailed technical reports on areas of expertise had to be formally presented. The meetings with the Prime Minister have often enabled the Council to quickly convert the guidance of the Prime Minister into specific implementation mechanisms. Particular mention could be made of the role played by the Council in identifying a *modus operandi* for the technology missions initiated by the Prime Minister. Initiation of programmes on superconductivity, parallel computing and minerals development, formulation of an approach to the perspective plan for 2001 AD, setting up of a National Science and Engineering Research Board, etc. are some other examples where the deliberations of the Council and its direct interaction with the Prime Minister resulted in specific action plans followed up by the Government. The Council is always anxious and very ambitious that action is indeed taken on many of its recommendations and it has highlighted this aspect of its functioning by the close follow-up of its recommendations not only with the Prime Minister's office but, where necessary, with concerned Ministries and with the Cabinet Secretariat. In spite of these efforts, it has always asked itself the question, 'How can the Council be more effective?'

Recommendations

In its deliberations so far, the Council has made 36 concrete recommendations to the Prime Minister, and a close follow-up is maintained by the Secretariat on the consideration of these recommendations by the Government through the work of the Empowered Group chaired by the Cabinet Secretary. The recommendations are always directly sent to the Prime Minister's office, which decides on those that are to be considered by the Empowered Group. The Secretariat of the Council, which is also the Secretariat for the Empowered Group, pursues these recommendations, but unfortunately, within the Government system and within its operational framework and limitations, coupled with the multiplicity of departments even within the S&T sector, it has not always been possible for the Empowered Group to arrive at quick decisions on the various recommendations. The Council has recognized this as an inherent price one has to pay for a democratic decision-making process, which has its own virtue in that it brings about involvement of various Government organizations. But one often notices a sense of disappointment in the members of the Council when they find that their recommendations are tossed around from one forum to another and the decisions delayed. Can one blame the Council for being over-anxious about implementation of its recommendations? Or should the Council's members compromise with the Government mechanism of decision-making?

Technical reports

One of the salient features of the Council's activities has been the publication of a series of technical reports on the various topics mentioned earlier. These reports were not intended to be state-of-the-art reports, but mainly to highlight the importance of emerging areas and to indicate steps that the Government should take to initiate national activities in these identified areas. There are 11 such technical reports and several of them have been

circulated to various Government Departments and to members of the scientific community. The Council is fully aware of the fact that these technical reports cannot stand on their own as professional reports that would stand the test of time as reference documents over the years. While these reports have identified the importance of these areas at a time when we must initiate national programmes in these areas, the Council has also considered the possibility of seeing whether it can play a role in producing (or setting up a mechanism for producing) these reports at a professional and academic level more in the form of technical reviews and with greater involvement of experts as well as other members of the academic community. While there may be a merit in preparing such detailed technical reports, there is the inherent danger that by the time such technical reports are prepared and edited and formally documented, the time for action would already have elapsed. It is with this concern that the Council has satisfied itself with bringing out technical reports that may have faced the general criticism by members of the scientific community of not being truly professional.

The Council has also been concerned with the question of management of natural resources from the point of view of meeting the requirements of the society as well as maintaining a balanced environment. Management of resources at the State and district levels has been given major attention by the Council and a specific report brought out based on the experience of the Karnataka State Council for Science and Technology. The Council also encouraged a pilot project for testing the feasibility of underground storage of flood water through programmes of deliberate excessive pumping of selected underground aquifers undertaken by the Agriculture Production Commissioner of the Uttar Pradesh State Government.

Perspective plan for 2001

One of the terms of reference of the Council was that relating to the perspective plan for 2001 AD. The Council approached this issue in a rather bold and innovative way, much to the surprise and chagrin of the official planners, who perhaps questioned the competence of the Council in undertaking this exercise. The Council was undaunted by these initial reactions and proceeded with its efforts, in the words of the Chairman, 'by writing from their heart what they felt the role that science and technology could play in the process of national development'. It categorized planning processing into two broad areas: (a) science and technology in planning the development of socioeconomic sectors, and (b) planning for the S&T sectors themselves. The question of integrating S&T with economic planning and setting the relative priorities within the S&T sector itself was once again the focus of the Council's approach and it boldly concluded that the existing mechanisms are not able to fulfil this objective unless the various organizational structures dealing with S&T-related activities are integrated. It commented on the multiplicity of S&T organizations that exist today and proposed the setting up of an apex body in the form of a National Science and Technology Commission, which will cut across all inter-sectoral needs of S&T in the socioeconomic sectors as well. This proposal of the Council has obviously resulted in raised eyebrows from several quarters of planners and decision-makers. Whether the Government accepts the proposal of the Council has yet to be seen but the perspective plan document of the Council—now often referred to as the red book—, unlike the usual Government documents, has certainly reached a wide cross-section of the community. The Council benefitted from the national debates organized at four different parts of the country—a suggestion emanating from the Prime Minister himself—and has been able to incorporate various suggestions in its final document, which also includes (in the typical approach of the Council) a series of 'recommendations for action'.

Issues to be discussed

Having reviewed its work during the first three years, the Council has considered a few selected areas on which it would like to concentrate its deliberations and provide a possible thrust to its activities during the last year of its term. One of such areas relates to the establishment of a Technology Development Fund which had been one of the recommendations of the Technology Policy Implementation Committee (TPIC) set up in 1983. The Technology Development Fund, which is expected to provide a boost to indigenous technology development, has not yet been established and the question of its operation by the Ministry of Industrial Development and its linkages with scientific departments and industrial R&D activity is of concern to the Council. The Council also feels that the Technology Information Forecasting and Assessment Council (TIFAC), which has also been set up as a

result of the deliberations of TPIC and where the Council had also given advice, has to be closely linked with the activities of the Technology Development Fund in view of the related areas connected with technology information, forecasting and assessment. While the TIFAC is being coordinated by the Department of Science and Technology, the Technology Development Fund is expected to be set up under the Ministry of Industrial Development, and the close linkage vital to the success of these schemes is not yet clear. The Council is particularly concerned about the fact that R&D efforts in the country over the coming decade have to be considerably enhanced in the academic sector, in the national laboratories, in the socioeconomic Ministries and also in industry. Special thrust may be given by the Council to this area.

In the area of technical education, the Council had made very major recommendations highlighting the 'crisis' in technical education as it exists today and had clearly indicated specific action programmes for inclusion in the Eighth Plan proposals. The members of the Council are greatly concerned with this state of affairs and it is likely that they will pursue this area further. Another crisis area is population, and the Council has raised the moot question, When will India's population growth start dececlarating? The Council is of the view that the problem of population must be tackled in a 'mission mode'. The mid-term appraisal of the Seventh Five-Year Plan has alarmed the Council because it shows that the rate of our population growth continues unabated. It believes that one of the most effective means of population control is widespread education of women and that the population control mission is chiefly societal and the S&T inputs are relatively marginal.

The entire question of increasing food production and the relevant agricultural inputs required has not yet been given due attention by the Council. No doubt it has initiated certain studies raising major issues in policies connected with fertilizer production and increased food production for the year 2001 AD What implications these studies will have in terms of bringing about changes in the national programmes has yet to be clearly delineated. The Council is conscious of the fact that agriculture has to be given very high priority in the coming years and may come up with some very clear-cut recommendations in the coming months. The Council has also informally discussed the question connected with the vexing issue of brain drain, but since several tomes have already been written on this subject by expert groups and committees, the Council is cautious in its approach to this subject before it makes its own recommendations. One of the issues to which the Council may like to give its attention is the entire question of autonomy to be given to scientific research institutions and organizations. While the erstwhile Science Advisory Committee to the Cabinet (SACC) had deliberated on this issue in great detail and the Government has even come up with office orders 'giving' autonomy to scientific research organizations such as ICAR and ICMR, the Council is concerned with the fact that autonomy has not yet been introduced and the scientific community working in these institutions is still waiting to imbibe the spirit with which the erstwhile SACC had tackled this issue.

Highlighting the role of S&T in national development problems, the Council had strongly recommended that the State S&T Councils, set up in all States, must be fully activated and strong linkages forged between the Planning Commission and the various Central S&T agencies. According to the Council, the State Councils are expected to play a more active role in promoting competitive high-technology efforts, especially in the small-scale sector. The Council may continue its efforts to strengthen the role of State S&T Councils in the coming years.

It appears that the agenda of issues to be tackled by the Council is indeed vast and to make a major dent in the coming year in some of these issues would require a great deal of innovative thinking and bold decision-making. The question is: how will the Government respond to this call of the scientific community reflected through the recommendations of the Science Advisory Council to the Prime Minister?

Acknowledgement

The author is grateful to the Chairman and members of the Council for encouraging him to frankly write about some of the issues connected with the functioning of the Council. The views expressed are those of the author, but the Council does share the concerns expressed in the article.