

editorial

Physics in perspective

One of the most striking findings of the recently completed Physics Survey is the overall vitality of the field. This is a tribute not only to the generous support received from the US public during the past two decades but also to the effective way this support has, on the whole, been used by the physics community in developing facilities and a body of trained manpower of unprecedented strength. At the same time, however, the Survey Committee emphasizes that this strength is in very real danger should current trends in support continue. There is also serious under-utilization of trained manpower in the field; even the most optimistic projections see no significant improvement in this area for several years in the future.

The Physics Survey report (available from: National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Avenue, Washington, DC 20488) presents a number of recommendations that bear on these problems. Moreover, it addresses the difficult questions of priorities within and between scientific subdisciplines and of national funding levels. It highlights some 15 high-leverage areas where increased activity and support might be expected to yield highest returns both in fundamental science and in service to society. In sum, it provides an agenda for possible future action in US physics.

This agenda represents the consensus of those physicists who were active in the preparation of the report. There will be some who may disagree to greater or lesser degree with the conclusions reached and with the Committee's recommendations. What is of greater importance, however, is the fact that the report provides, in many instances for the first time, a wealth of supporting documentation and statistical information that can provide the basis for development of entirely independent conclusions by different groups of interested physicists. It is important that such independent evaluations be undertaken and that the Survey Committee's suggested agenda be refined through discussions involving as large a fraction as possible of the scientific community.

It is perhaps inevitable that no complete consensus regarding future directions can ever be reached in any scientific discipline or subdiscipline; indeed the diversity of opinion and approach that has characterized US physics in the past must be recognized as a significant source of our present

strength. We must also recognize that to effect any major change, as in the character or attitudes of physics education, or to develop effective support for any major national research facility, a general consensus among those active in relevant areas of the science is increasingly important. During the 1960's it was frequently possible to have "one, if not more, of each" when major facilities were proposed. These have been, and continue to be, effectively utilized. But the situation in the 1970's will inevitably be very different as physics competes for its share of the disposable national resources against a growing list of other very real and pressing national problems and goals.

In a number of fields of physics, there have been no new starts on major facilities within the past five years nor are any foreseen in the immediate future. Effectively, with a few outstanding exceptions, we are not providing a base for the coming generation of physicists in any way comparable to what we have enjoyed and inherited from our scientific elders. This can have important long-range consequences for the continuing strength of US physics and the role it will be in a position to play in both the US and the international communities.

Education in physics, and perhaps even more important, physics in education, are in urgent need of re-examination in this country. The development of more coherent long-range plans for better matching the training of scientific manpower to the available and projected career opportunities is long overdue. The physics community has long neglected its responsibility to provide the general public with a greater awareness of both its activities and opportunities and its present and potential contribution to US society.

These are serious questions, and widespread discussion of them, and of others raised in the Physics Survey, must be stimulated within US physics. The Survey Committee has attempted to spell out the problems and opportunities now facing the field. To realize these opportunities will be far from easy, but if we fail to make the attempt our science can suffer irreparable damage. The Survey Committee hopes that its report can serve as the basis for development of the broad scientific consensus that will be essential for effective national action.

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