



Viewpoints:

Individual and Collective

Physics in Perspective and *Physics in the Twentieth Century* are two books which offer contrasting views of physics on the one hand, whilst they are complementary on the other. As physics itself progresses with contributions from individuals and from groups, it is refreshing and instructive to read how physics appears from these two aspects. It is the more rewarding when one appreciates that the individual, V.F. Weisskopf, was also a member of the group, the Physics Survey Committee. Then, one can identify the impact that his contributions had on the final form of the collective view.

Physics in Perspective, let us be clear, sets out to 'sell' physics to the Administration in Washington. However, it does so in a way which has evoked much comment. For example, Philip Abelson of *Science* has accused the report of being 'self-serving' in that its only aim is to gain more financial support for physics. E.G. Sherburne, Jr., of *Science News* has also attacked the report because, although it identifies public understanding of physics as necessary, it does so only to serve the interests of physicists. Clearly, such influential science writers believe that the public's needs in understanding physics are somewhat different from what the physicists want to offer.

Physics in Perspective too often justifies further support upon the contribution of physics to national

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Trends in Physics

The Proceedings of the Second General Conference of the European Physical Society, held at Wiesbaden from 3-6 October 1972, has been published. The Conference carried the title 'Trends in Physics', which is another way of saying 'The Growth Points of Physics' — the title of the inaugural conference of EPS, held in Florence in 1969.

These Conferences take stock of the physics scene and bring scientists together from all branches. Some people might not regard such an exercise as useful. A specialized conference can get its teeth deep into a subject and active research workers discuss, formally and informally, their work in detail. A General Conference is by definition more diffuse. Review talks cover many branches of research and are 'generalized' so as to be accessible to physicists working on other problems. Thus, the benefits are less direct but can be even more important.

There can be benefit from 'cross-fertilization' — advances in understanding and/or technique carrying over from one branch of research to another. Within physics many subjects are intermeshed, but it is comparatively rarely that physicists in different fields talk together. And yet some oracles grade the importance of a branch of research by its relevance to other research!

A different benefit from a General Conference is that physicists lift their heads up and take a broader look at physics. Physicists cannot have their heads up all the time — heads usually have to be down to do research. But, from time to time, it is important to see how individual research fits into the progress of physics as a whole. At both EPS General Conferences, most participants have found this broader look very stimulating intellectually; they have returned to their own laboratories to kick boxes of

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electronics much more enthusiastically.

The Florence Conference was a glory. The Wiesbaden Conference could not aspire to the same heights but it was also a very great success. The high quality is reflected in the Proceedings. The Proceedings include the plenary lectures and a few talks given at Divisional sessions. (Three plenary lectures, however, are represented only by brief notes and one is not covered at all — perhaps a measure of the interest in these subjects.)

The Proceedings does not serve primarily to inform a physicist how his subject is progressing, but is a fine collection of reviews on the main lines of development in physics. Many talks were so outstanding that they distilled the essence of a subject in a way which will attract the interest of any physicist. Among these, for example, are **W. Kundt** on *The origin of the universe*, **A. Abragam** on *Nuclear pseudomagnetism*, **A. Schlüter** on *On the way to a fusion reactor* and **L. van Hove** on *Recent developments in high energy physics*.

At Wiesbaden it was obvious that the dominant 'Trend in Physics' at present is an increasing concern about the interrelation of physics and society. It is appropriate, therefore, that this topic receives a fair share of attention in the Proceedings. There is the thought-provoking talk of **J. Tinbergen** on *Environment, scientific research and economic policy*, the personal statement of **H.B.G. Casimir** on *Physics and Society* and the report by the EPS Advisory Committee on *Physics and Society*.

These three contributions should be required reading for the modern physicist — not because they present solutions, but because they present the problems in a balanced way. In general, these contributions neither inflate the problems, so that the case

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goals, without examining whether these goals themselves are desirable or rational. It was unfortunate that the members of the Physics Survey Committee had not had access to the paper by T. Nagel on 'Reason and National Goals' (*Science*, **177**, 1 September 1972). Otherwise, they might have taken the opportunity to broaden the range of factors accepted as relevant in their appeals for public funds. In fact, the report's conclusion on the subject was vague: 'Relevance (to national goals) is not always obvious at first, and its discovery requires serious intellectual effort from both scientists and potential users of science.'

Despite these criticisms of *Physics in Perspective*, the volume can hardly be faulted in its organization, presentation and potential influence. Apart from those on financial considerations, the report contains interesting chapters on: The Nature of Physics, Physics and U.S. Society, International Aspects of Physics, Physics in Education and Education in Physics, and Dissemination and Use of Information of Physics.

Perhaps it is unfortunate that such an excellent report for physics in the U.S.A. should have appeared

only six months before the President in Washington dispensed with the services of a Science Advisor. Certainly, the emphasis there has shifted to technology and its assessment, which might lead to more immediate results, if not, in the long-term, beneficial.

The title of *Physics in the Twentieth Century* is taken from the lecture that V.F. Weisskopf delivered to the Inaugural Conference of the European Physical Society in Florence in April 1969, seven months after the Society's foundation on 26 September 1968. It is a book which should have an appeal to physicists, although it might be somewhat technical for a more general audience. That is a pity, because Parts 1 and 4 could well have been the basis for a campaign of public education in physics about which Weisskopf is so obviously keen.

Physics in the Twentieth Century is organized in four parts which are almost as orthogonal as the three views of physics that Weisskopf proffers in the most comprehensive of his essays 'The Significance of Science'. Following the foreword by Hans Bethe and an autobiographical contribution on 'My Life as a Physicist', the four parts are:

- 1 Fundamental Questions;
- 2 Survey Essays;

- 3 Special Approaches;
- 4 General Essays.

The contributions extend over twenty-three years from the 1949 survey essay on 'Recent Developments in the Theory of the Electron' to the 1972 general essay on 'The Significance of Science'. It is apparent that, gradually over this period, Weisskopf's interests have shifted from explaining physics to physicists to portraying physics as an element of human culture.

Between 1960 and 1965 as Director General of CERN for a statutory five-year term, Weisskopf had years that were 'among the most wonderful of my life'. Since his return to the U.S.A., he has been appointed chairman of the High Energy Physics Advisory Panel (HEPAP) which gives policy advice on the construction and operation of high energy accelerators. Physicists cannot help but be intrigued and curious to read these selected essays of one, who has, for so many years, been at the pinnacle of his profession.

PHYSICS SURVEY COMMITTEE *Physics in Perspective: Volume 1* (National Academy of Sciences, Washington, D.C., 1972) 1032 pages + Index. \$ 25.00.

WEISSKOPF, V.F. *Physics in the Twentieth Century: Selected Essays* (The MIT Press, London, 1972) 364 pages + Index. £ 3.60.

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