Symposium E 1: Synchrotron Radiation

Synchrotron radiation is emitted when an electron or a positron undergoes radial acceleration. Relativistic effects cause the radiation to be focused and polarised in the plane of the trajectory. With high energy accelerators and storage rings the light emitted spans the X-ray to far infrared regions. In the X-ray domain, it is more intense than the most powerful X-ray tubes and has additional advantages due to its white light character. In the soft X-ray and vacuum ultraviolet regions, synchrotron radiation is an incomparable source. The pulsed radiation emitted by a storage ring has very high spatial and temporal reproducibility and extremely low noise. It can be used to study atomic and molecular relaxation processes on the subnanosecond scale.

Synchrotron radiation has applications in fields as diverse as atomic physics, molecular photophysics and photochemistry, photoemission from solids, surface physics and chemistry, space physics and instrumentation X-ray micrography, microeletronics, proteins and virus structure, kinetics of dynamic processes in the solid state, muscle contraction, etc. Many of these applications will be discussed in the invited talks and contributions. In addition there will be talks on the basic physics of synchrotron radiation and on synchrotron radiation in high energy astrophysics.

There are more than twenty synchrotron radiation facilities in the world. European laboratories exist or are planned in the U.K. (Daresbury), France (Orsay), Germany (Hamburg, Bonn), Holland, Sweden, Italy (Frascati) and the U.S.S.R. (Moscow, Erivan, Tomsk, Novosibirsk). The interaction and collaboration in a single institute, of scientists from many different disciplines, with the common denominator of using synchrotron radiation, provides an unusual opportunity for interdisciplinary work.

S. Leach

Physics and Society

In the programme of the York Conference due attention will be paid to physics and Society interactions. We are all concerned with the two questions : "What does Society expect from physics ?", "What can we offer Society ?".

The EPS Advisory Committee on Physics and Society has been asked to prepare the programme. Two plenary lectures will be given, one on "Physics and the Developing Countries", the other on "Physics and the Arms Race". In parallel with the scientific Symposia, two afternoons are devoted to the discussion groups on four selected topics. A general discussion is arranged for one evening.

Four topics have been selected, and the two plenary lectures can be seen as introductions to the discussion of two of them.

Physics and the Developing Countries is the first theme and also the title of the Cecil Powell Memorial Lecture which will be given by Professor M.G.K. Menon from India, who has great experience in the subject and who has been a counsellor to UNESCO on the problems of the transfer of technology to less developed countries.

This theme might be one of the most important issues in the near future and activities directed towards helping physics in developing countries must be encouraged. It gives rise to many problems which will probably be discussed : What kind of physics is needed now and in the near future in these countries (for education, for application, for technology) ? What are the real difficulties in the transfer of technology taking account of the specific local conditions ? How can European physicists contribute ? What can scientists do in the real reshaping of international order ? Do they face up to the huge gap between rich and poor countries ?

World Problems associated with the growth of science and technology can be considered as the second topic.

Physics and the Arms Race will be the title of the second plenary lecture given by F. Barnaby, Director of the well known Stockholm International Peace Research Institute, a world-wide respected organization whose purpose is to alert public opinion on the danger of the arms race, and particularly of the overkill capacity of the nuclear stockpile in the world.

Scientists have to be aware of the facts. There is no reason to blame science or the scientists for the sins of Society but scientists and scientific organizations have a special responsability to bring the arms race to an end and to achieve a real measure of disarmament.

Other human problems associated with the growth of science and technology will surely be discussed. How can we contribute to a better use of natural resources, to solve some problems of environmental deterioration, to minimize the dangers associated with the use of nuclear power and to improve the level of living everywhere in the world ?

Lay Concept of Physics is the third theme of discussion. What does the layman want and need to know about physics ? How can physicists contribute to a better understanding of physics by non physicists ?

During the EPS General Assembly at York a talk will be given by the winner of the EPS award to encourage efforts for the popularization of physics. This will be an introduction to one aspect of the third theme.

A fourth discussion group will be organized on the problem of *Interdisciplinarity*. How to improve the training of physicists to avoid the tendency of overspecialization and of isolation from other scientists ? What are experiences in this respect in the different European countries.

The Advisory Committee on Physics and Society has encouraged the formation of study groups in every country and we hope that many of them will bring useful contributions to the discussion at York. We should like to encourage lively and concrete contributions of people who have personal experience of one of the specific subjects and to discourage formal and vague reports on general matters. The abstracts of some of them will be distributed to the participants at the Conference *.

We are all concerned with these important problems which are not the privilege of a few very specialized people. Both the young physicists who raise questions on the rôle of physics and the physicists actively engaged in research and all its social implications, are invited to participate in the Physics and Society programme which corresponds to an important aim of the European Physical Society.

H. van Regemorter

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