



Student Exchange Programme

The role of the EPS

G. Bernardini

The European Physical Society came into existence because the first initiatives rapidly gained the support of a large number of physicists. Also most of the existing national societies and academies, in spite of a great variety of aims and structures, supported the movement from the beginning.

This broad support from the community of European scientists does not need any profound explanation. In the minds of most scientifically educated people the idea that Europe will achieve the status of a great nation is not only an appealing perspective but also the ineluctable end of a process which may temporarily slow down but will not be stopped or reversed.

Actually the cultural links and the scientific collaboration between the scientists of European countries show that in many respects, particularly those more relevant to the future, a European nation already exists over and beyond the present political situation.

The programme of the EPS is guided by the recognition of this reality. One of the items of this programme, possibly the most important, concerns scientific training and education. It is perhaps not as complex as it may appear because the differences between the systems of education of European countries are more superficial than substantial. They show the effects of their common roots in the same great culture. For this reason, although differences do exist, they have almost negligible influence when the period of University study is over and a graduate student or a post-doctorate fellow begins his creative scientific work. For us in Europe the basic problem is to offer these people the same degree of opportunity, the

same facilities, independently of the country in which they completed their first period of University studies.

One great European institution offering a splendid example in this respect is CERN. Others known to me are the International Centre for Theoretical Physics of the International Atomic Energy Agency and the European Molecular Biology Organization: the former gives special consideration to the first rate young physicists coming from the developing countries throughout the world; the latter offers to young people interested in molecular biology the opportunity to choose from among the European centres of research in this field the one in which they may continue their research under the best conditions. Probably, the example of EMBO is the most closely related to what the EPS may do.

In what follows, some personal ideas concerning the ways in which the EPS may contribute to education and scientific training in Europe are presented with the aim of calling the attention of the members of the Society to this problem and stimulating discussion.

In Europe, it does not occur very often that a student can complete his undergraduate and graduate studies and continue his scientific research in the same university. This is often impossible and, in any case, it may not be desirable that this should happen. It is now widely accepted that change, even if temporary, is more fruitful. Changes bring contact with new ideas and personalities. The acquisition of new techniques tends to develop originality and imagination, the intellectual qualities almost exclusively peculiar to youth.

Fortunately, fellowships or similar grants are offered today by several

European academies, universities and institutions. They are already quite numerous and normally very attractive. For instance, some with which I am personally more acquainted are: the students programme of the Royal Society (UK), the programme of the Accademia Nazionale dei Lincei (Italy), the fellowship schemes of CERN, Dubna and the Niels Bohr Institute, and the similar grants organization of the International Centre for Theoretical Physics in Trieste.

They offer, with a minimum of bureaucracy, to anyone having the required qualifications, excellent opportunities to spend one, two or more years in the most active and stimulating centres of study and research in Europe. There are many more of the same kind with more or less equivalent programmes, but unfortunately, I know them mainly through the overlapping posters hanging on the walls of the Scuola Normale Superiore.

These posters are numerous and all look alike. It is not surprising then that many students are rather disoriented at the time when they have to make a choice. Something similar can be said for the indecisions created by the programmes of the many Summer Schools established in practically every European country which has some villa or castle to offer with a nice view on some mountain or lake.

In this situation the contribution of the EPS obviously cannot be simply to increase the number of grants and opportunities. Anyhow to provide money for this purpose is not a matter of direct concern to an organization like EPS.

However, in both pure and applied physics the EPS is already unique in assembling exceptional competence well balanced over a broad range of

Professor Bernardini photographed at CERN in the early 1960s when he played a leading role in establishing the experimental programmes which are open to scientists from Universities throughout Europe.

research. Its members, individuals, groups or societies and particularly its Divisions are assuring the highest level of competence.

This competence may be used in many ways. For instance :

- i) to collect in one publication issued semestrally (for instance at the end of the Summer and at the end of the Winter) in a coordinated manner, according to the fields or topics, timing and locations, the relevant information concerning post-doctoral fellowships and post-graduate student grants all over Europe
- ii) to provide, on specific request, further information for those people who do not find all they want in the publication
- iii) to advise those who are hesitating between two or more similar opportunities
- iv) to support the applications deserving particular consideration
- v) to stimulate among the Academies, Societies and other institutions a balanced distribution of the grants available among different fields

and disciplines, so as to favour the most promising lines of research in pure and applied physics

- vi) to increase the scientific exchange and contact between Eastern and Western European physicists and to assist in solving problems, if any, related to currencies and visas
- vii) to issue "scientific passports" as once suggested by Professor Cecile Morette DeWitt, containing information on the curricula followed, the degrees held and other relevant data relating to the culture and talent of a graduate student or young physicist.

Similar action could be taken for the students attending Summer School courses. The periods of attendance are short but their aims and problems are not very different from those encountered in the exchange between universities and laboratories.

Actually the Summer Schools in their short periods of activity, meet some of the most pressing needs of

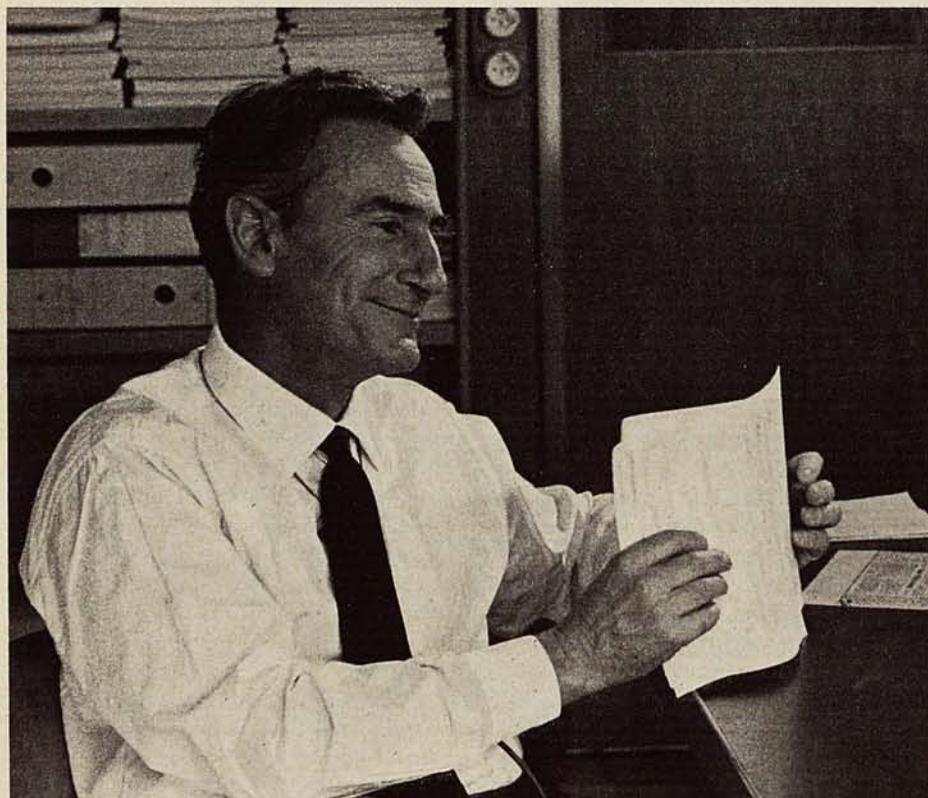
students and young physicists. They make it possible for these people to become well acquainted with new problems, new subjects, new ways of thinking. In a few weeks they are able to initiate intellectual links, to stimulate collaboration and even solid friendships among people who had thought themselves to be strangers. They play therefore, besides their direct role of promoting the acquisition of new scientific knowledge, a role in the development of the European Scientific Community.

Finally, thinking about the long term tasks for the Society, I come to what is probably one of the more difficult and more ambitious tasks. It is that of the equivalence of university titles and degrees. At present, it is rather frequent that a physicist with good degrees from a good university has difficulty finding a good job in another country. Even more frequently a student going from one country to another meets serious difficulties in having the qualifications he has already obtained properly and adequately recognized.

The almost systematic underestimation of the academic degrees and titles gained in foreign universities has its origins in many administrative attitudes. These can be partly explained as being due to a lack of adequate information but are less justified when they serve simply as a defence of position and privilege.

The EPS may envisage helping the Council of Europe and other bodies which are trying to establish rules on this matter. The Society can assist the studies now being made of European university degrees and curricula, by giving information and providing communication channels in addition to those already existing.

The EPS may also give direct support with the weight of its authority, to elevating the opinion held of foreign university degrees and titles, whenever they merit it. In some cases, at least for the more broadly-based universities, an appropriate statement, a "to whom it may concern", issued by the Society may be more useful than



a "letter of recommendation" from the student's university.

Probably other tasks may be tackled concerning the "students and post-doctoral programme" of the EPS. But those listed above are already, on the whole, more ambitious than the Society could handle with its forces and resources at present or for the next few years.

However, this could be said about all the activities of the Society. Officially it has had only one year of life and its survival depends on the continuation of the atmosphere that promoted its foundation and has sustained it till now. This atmosphere is largely due to the personal convictions and support of the members of the Society. Experience so far shows that they (that is to say: a large fraction of the most distinguished European physicists) are willing to take an active part, without remuneration, shouldering the responsibilities required for the life of the Society. In this way they feel that they offer something valuable to the scientific, social and political evolution of Europe. This is a matter that concerns all of them because perhaps more than anyone else, they are aware that Science today means more and more to the future of human society.

Placing reliance on the collaboration of the members of the Society, the first step concerning the "students" programme are following the established precedents according to the procedure laid down in the by-laws of the Society — that is the constitution of an "Advisory Committee on Education" to the Executive Committee as approved by the Council in Vienna. This new Committee will start work in the next few weeks.

In the first period of its activity, it will be similar to the other "Advisory Committees" when information must be gathered and analyzed. In a second stage it may be given some executive authority with a more or less **permanent** status. What will change is its composition. Membership of this Committee will constitute a considerable burden and, for this reason, a member will serve for two or three years only. This Committee is to be composed mainly of persons recommended by the Divisions.

It is expected that the Committee will propose a timescale for the actions to be taken by the Society. It may also gradually prepare its evolution to an almost permanent body having the help of ancillary staff and of a small organization.

Letters to the Editor

Sir,

I listened carefully to the lecture by Professor Amaldi on the subject of "Physics and Education", during the Inaugural Conference of the EPS. I would like to make several comments concerning high school teaching.

I think that the P.S.S.C. may be useful in the first years of physics teaching, but I know that in Italy, for instance, some student pioneer classes have been created, in which modern mathematics are taught in a formal and logical way. I suggest that the same should apply in physics also: in the intermediate teaching years the various formal theories ought to be taught using group theory, symbolic logic, physical dimension theory, and so on. Thus the different notions, taken chiefly from experience, will be scientifically organized.

Finally, I think that one year should be entirely devoted to deepening the fundamental concepts, which are the background of relativity, quantum theory and modern physics, to analyzing from an epistemological viewpoint all previous studies, and to considering the value of physics for building the new "Scientific Humanism".

I suggest that the European Physical Society proposes the establishment in Europe of a five year physics course in High Schools:

- two "experimental" years, of the P.S.S.C type
- two "theoretical" years, using formal logical methods and modern mathematics
- one "philosophical" year, using also the subjects put forward in the Harvard Physics Project.

E. Recami (Catania)

Sir,

I wish to suggest a compact symbol for use in journals.

I remember urging long ago, at Harvard in 1932, the use of "MeV" instead of the clumsy (and incorrect) "million volts". I now wish to suggest a short

way of writing "relativistic". The symbol \hat{c} is available in type and remarks such as \hat{c} -particles or \hat{c} -speed would soon be well understood — with a more direct meaning than the full word, which still has a slight flavour of peculiarity.

E.M. Rogers (Princeton)

Documentation Centre

We would like to draw the attention of solid state physicists to the **centre of documentation on the synthesis of crystals** which has been operated since February 1965 by the laboratory of molecular — and crystal — physics of the Science Faculty of Montpellier. Upon written inquiry the centre gives rapid information on the laboratories in which a given crystal is produced, the method of production, the purity and doping, dimensions etc. Three booklets containing part of this information, may be obtained on request.

Information can be obtained at the following address:

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