

# INTERNATIONAL CONFERENCE ON PHYSICS EDUCATION

## RESOLUTIONS

*The Conference has accepted, without dissent, the following resolutions. Some of the comments and recommendations concerning education in physics may apply to education in other subjects, and we are particularly aware that similar consideration might profitably be given to the teaching of chemistry and mathematics, subjects which need to be taught effectively if the efforts of even the best physics teachers are not to be seriously impaired. However, since this conference has been composed exclusively of physicists, we have limited our comments and recommendations to the subject on which we may claim to speak with authority.*

### WE RESOLVE AS FOLLOWS:

- I. *In our view, physics is an essential part of the intellectual life of man at the present day, and the study of physics provides a unique interplay of logical and experimental disciplines. Studying physics and the physicist's methods of acquiring and evaluating knowledge should therefore be regarded as a necessary part of the education of all children.*
  
- II. *In many countries, education in physics, both for nonspecialists and for future specialists, is unsatisfactory. In all countries, improvement is essential at some levels of teaching. Experiments have been initiated in some countries to try to find ways to make improvements; we welcome and encourage such experiments. They are particularly necessary and important at the level of secondary schools or their equivalent. Experiments and solutions will probably take different forms in different countries.*

## INTERNATIONAL EDUCATION IN PHYSICS

*We should like to see one or more international institutes established, among their functions being the devising and carrying out of experiments of this kind.*

*We recommend to the International Union of Pure and Applied Physics that it should take appropriate action, possibly in collaboration with other international organizations, to establish an international committee of professional physicists to accept responsibility for:*

- 1. The collection, evaluation, and co-ordination of information and the stimulation of experiments at all levels of physics education.*
- 2. The suggesting of ways in which the facilities for the study of physics at all levels might be improved in various countries.*
- 3. The collection and evaluation of information on methods used for the assessment of standards of performance of students of physics and for the evaluation of the qualifications and effectiveness of teachers of physics.*
- 4. The giving of help to teachers in incorporating modern knowledge in their courses.*
- 5. The promotion of the exchange of information and ideas among all countries by methods that would include the holding of international conferences.*

**III.** *We ask our Chairman, Professor Sanborn C. Brown, to accept on our behalf the invitation of the Secretary-General of the International Union of Pure and Applied Physics to attend the Ottawa meeting of the General Assembly of the Union, to present the resolutions and recommendations of this Conference, of which the Union was one of the sponsors, and in particular to ask the Union to accept the responsibility proposed in Resolution II.*

**IV.** *We stress that efficient instruction in physics requires specialized teachers who can keep abreast of developments in a rapidly growing subject. We are alarmed at the present shortage of such teachers, particularly in view of the growing demand for physics education. The shortage is likely to become more acute in the years ahead.*

## RESOLUTIONS

*In our opinion, steps should be taken to improve both the efficiency and the attractiveness of physics teaching as a profession. Insofar as the realization of these aims requires action by governments and universities, we recommend that these bodies should consider the following general conclusions:*

- 1. In schools of secondary and higher levels, physics should be taught by physicists, that is, by men and women who have received a professional training in physics. Teachers must be encouraged to keep their professional experience up-to-date. The experimental nature of physics places an added burden on the teacher, and this must be recognized and adequately compensated by a reduction of his teaching hours and in other suitable ways.*
  - 2. To make teaching careers more attractive, improvements of salary and status are necessary in some cases, but most important are better conditions of work. For example, technical assistance and liberal provision of apparatus are vital, and facilities should be provided for all students at all levels to carry out experiments. Secondary-school teachers should have conditions in which they can feel that they form an integral part of the development of physical knowledge.*
  - 3. Universities and comparable institutions should accept their responsibility to establish close relations with secondary-school teachers, to assist in solving the problems of instruction in schools, and to provide refresher courses. These courses would require extended periods of study leave for teachers.*
- v. As members of this Conference, we have derived great benefit and stimulus both from its deliberations and from the opportunities for discussion. We recommend that further such international conferences be held from time to time to examine and discuss the problems of physics education. In future conferences it may be considered desirable to restrict somewhat the range of topics discussed.*

UNESCO HOUSE, PARIS  
August 4, 1960