

Meetings

7th IUPAP Assembly

A Report from Copenhagen

The seventh general assembly of the International Union of Pure and Applied Physics was held at Copenhagen, July 11, 12, and 13, 1951. Since its formation in 1922 this Union has been the official mechanism for the twenty-five participating countries to take international action on standards for physical measurements of such quantities as length, mass, time, heat, sound, electricity, magnetism, radioactivity, and optics, and to promote collaboration between the physicists of the world, both in analyzing the problems of units and nomenclature, and in studying the nature of the physical world. For this purpose it has set up sixteen working committees to recommend international action on topics which range from the physics of low temperatures to radio-meteorology. In addition, it arranges for international colloquia, numbering on the average about three a year (Amsterdam, September 1950, Spectroscopy of Short Waves; Paris, May 1951, The Techniques of Observation by Phase Contrast and Interference Contrast; Brussels, June 1951, Ultrasonics; etc.). To support these activities the International Union of Physics relies upon annual dues paid by the participating countries (\$320.00 in the case of the United States, appropriated by the Congress and handled through the Department of State) and upon an annual subvention of the order of \$16,000 from Unesco.

To promote the international colloquia and to assist its working committees is the responsibility of IUPAP's executive committee, which consists of the president and six to nine vice presidents. The executive committee meets once a year, generally at the time of one of the colloquia. Every three years there is a meeting of the general assembly. At that time delegates from the participating countries take legislative and judicial action. They elect the new executive committee. They also pass on the recommendations of the working committees and legislate into effect those of which they approve.

The following countries were represented by official delegations:

Australia	E. O. Hercus	
Belgium	C. Manneback	Louvain
Brazil	B. Gross	Rio de Janeiro
Canada	J. S. Foster	Montreal
	L. E. Howlett	Ottawa

Denmark	N. Bohr	Copenhagen
	H. M. Hansen	Copenhagen
	J. C. Jacobsen	Copenhagen
	G. Møller	Copenhagen
Spain	A. Duran	Madrid
United States	K. K. Darrow	New York
	P. P. Ewald	New York
	H. A. Barton	New York
	D. M. Dennison	Ann Arbor
	H. H. Nielson	Columbus
	L. A. Turner	Chicago
	T. Lauritsen	Pasadena
	E. Hutchisson	Cleveland
	J. A. Wheeler	Princeton
	J. C. Slater	Cambridge, Mass.
	N. Fontell	Helsingfors
	L. Simons	Helsingfors
Finland		
France	J. Cabannes	Paris
	G. Darrieus	Paris
	A. Perard	Sevres
	A. Proca	Paris
Great Britain	Sir C. Darwin	Cambridge
	H. H. Awbery	Hampton
	E. A. Guggenheim	Reading
	H. S. W. Massey	London
	E. E. Simon	Oxford
	Sir G. Thomson	London
India	Sir S. Krishnan	New Delhi
	H. J. Bhabha	Bombay
Italy	E. Amaldi	Rome
	A. Carrelli	Naples
	B. Ferretti	Rome
	E. Perucca	Turin
	G. Wataghin	Milan
	Syoiti Sakata	Nagoya
Japan	M. Kotani	Tokyo
	S. Miyake	Tokyo
	J. Holtsmark	Oslo
Norway	E. Hylleraas	Oslo
	H. Wergeland	Trondheim
	C. J. Bakker	Amsterdam
Netherlands	J. deBoer	Amsterdam
	H. B. G. Casimir	Eindhoven
	P. Koster	
	L. Hulthen	Stockholm
Sweden	I. Waller	Lund
	H. König	Bern
Switzerland		

No representative was present from the following member countries of IUPAP: Argentina, China, Egypt, Hungary, Mexico, Poland, Czechoslovakia, Union of South Africa.

Related organizations which participated in the seventh general assembly of IUPAP were Unesco, represented by P. Auger (Paris), and the International Council of Scientific Unions (which includes the International Union of Physics, the International Union of Chemistry, etc.), represented by R. Fraser (Paris), the liaison officer between ICSU and Unesco.

The executive committee consisted of the following:

H. A. Kramers (President)	Leiden
P. Fleury (Secretary)	Paris
E. Amaldi	Rome
C. Darwin	Cambridge
C. J. Gorter	Leiden
C. Z. Bialobrzeski (Absent)	Warsaw
P. Scherrer	Zurich
J. C. Jacobsen	Copenhagen
K. K. Darrow	New York
P. P. Ewald	New York
J. C. Slater	Cambridge, Mass.

One of the most important items to come before the Union was the matter of establishing an international laboratory in Europe for the study of high energy physics. A suggestion in this direction came from Professor I. I. Rabi of Columbia University at the congress held in Florence, last year, and has since been the subject of active discussion in Europe. Professor Auger of Unesco has been taking an active part in exploring this question with the interested parties and made an interim report on the present status of the discussions. It is clear that the setting up of such a laboratory will require an amount of money far beyond the means of the IUPAP or even Unesco. For this reason, it will only be possible to create such an international collaborative laboratory—along the lines of the Argonne National Laboratory near Chicago or Brookhaven National Laboratory on Long Island—if adequate subventions are received from the interested European governments. Presumably, a resolution on the part of IUPAP in favor of such a project would precede any active effort to solicit support. The time did not appear ripe either for such a resolution or for such active solicitation. Instead, the question of probable cost is still under study as well as the still more complex question of organization and effects—favorable and unfavorable—on the functioning of universities, on the training of students, and on the availability of scientific manpower. The assembly of IUPAP voted to send the past president, Professor H. A. Kramers, and the new president, Professor N. F. Mott, as observers to a conference to be held in Paris on the question of establishing such a high energy international collaborative laboratory.

An impression of the interests of the Union is given by the operations of its six specialized working committees, five of which were previously in existence and the sixth of which, the Committee or Commission on Acoustics, was created at this Copenhagen meeting.

The Committee on Symbols, Units, and Nomenclature recommended that the practical system of electrical units should be based on the meter, the second, the kilogram, and the ampere. The name of this system should be either MKSA System or Giorgi System. In this connection the ampere, according to the General Conference of Weights and Measures, is "the intensity of a constant electric current which, maintained in two parallel rectilinear and infinitely long current conductors of negligible cross section, produces in vacuum between

these two conductors a force equal to 2×10^{-7} newton per meter length." Recommendations were also made by the committee to deal with the situation that two systems of units will be simultaneously used from now on in pure and applied physics, the CGS system and the MKSA system. The SUN committee considered seriously the question of naming the elementary unit of electric charge in the CGS system as the "franklin", but it decided to postpone any definitive action on this point until the wishes of physicists become clearer. The problem was considered of the rationalization of electric units—the use by some authors of quantities for the electric field strength and magnetic field strength differing from the usual quantities by a factor of 4π . It was considered not desirable to recommend for physicists the exclusive use either of rationalized or non-rationalized equations. However, if equations are rationalized, the SUN committee considers that the rationalization should be indicated by the use of symbols with a cross through them so as to avoid confusion with the usual uncrossed symbols which would continue to represent the non-rationalized field quantities. It was felt desirable to propose to the International Electro Technical Committee the formation of a joint committee to discuss and make recommendations on all questions connected with rationalization. Incidentally, it is the practice in any case to discuss the question of units with appropriate committees from other unions whether in the field of electric technology or in the field of chemistry. After discussions with the chemists and other interested organizations, the SUN committee gave its approval to symbols for the isotopes of the elements which would carry to the left of the usual chemical symbol both the mass number (above) and the charge number (below). Dr. H. A. Barton, Director of the American Institute of Physics and one of the delegates, brought up the difficulties of printing this type of symbol, which had already been discussed by the SUN committee. In the light of the discussion it was concluded by the general assembly that the SUN recommendation should be put into effect when and as the printing problems could be solved. The spaces on the right of the usual chemical symbol are to remain free for indicating the number of atoms combined into a molecule (below) and state of ionization (above). The SUN committee is preparing a new booklet to summarize the status of physical units and nomenclature as of this time. The new membership of this committee is the following:

H. König (President)	Berne
J. deBoer (Secretary)	Amsterdam
A. Perard	Sèvres
E. Perucca	Turin
J. H. Van Vleck	Cambridge, Mass.
J. Cabannes	Paris
E. Guggenheim	Reading

A recommendation was made to avoid the use of the word "billion" in scientific literature owing to the difference in the meaning of this term in different countries. In the case of high energy physics, it was recom-

mended to use, instead, either 10^9 eV or GeV ("giga electron volt") as accepted by the IUPAP in 1948.

Reports on recent and forthcoming colloquia and on other projects were made by the following additional working committees, the new membership of which is indicated below:

Thermodynamics and Statistical Mechanics

J. Mayer (President)	Chicago
I. Prigogine (Secretary)	Brussels
E. Bauer	Paris
J. A. Beattie	Cambridge, Mass.
G. S. Rushbrooke	New Castle
S. R. deGroot	Utrecht

Cosmic Rays

P. M. S. Blackett (President)	Manchester
L. Leprince-Ringuet (Secretary)	Paris
C. D. Anderson	Pasadena
G. Bernardini	Rome
H. J. Bhabha	Bombay
M. S. Vallarta	Mexico City

Very Low Temperatures

F. E. Simon (President)	Oxford
C. J. Gorter (Secretary)	Leiden
F. C. Brickwedde	Washington
A. van Itterbeek	Louvain
K. Clusius	Zurich
C. E. Lane	New Haven

The new specialized working committee on acoustics is proceeding with plans for a new journal of acoustics and for a general conference on acoustics probably to be held in the Netherlands some time in the summer of 1952. The membership of this new committee comprises:

R. D. Bolt (President)	Cambridge, Mass.
C. W. Kosten (Secretary)	Delft
F. Canac	Marseille
F. Ingerslev	Copenhagen
W. P. Wilson	Tadworth
E. Meyer	Göttingen
A. Giacomini	Rome

The Committee on Publications discussed the importance of Russian contributions to physics and related sciences and expressed its interest in the establishment of an information and translation service available to all interested. This committee together with the Executive Committee of the International Council of Scientific Unions intends to consider the possibility of issuing a journal of translations established with the cooperation of existing partial documentation services. It also expressed its support for the work of the Joint Committee on Physics Abstracting in promoting the establishment of an international abstracting service. The new membership of the Committee on Publications is:

J. H. Awwberry (President)	London
G. A. Beutry (Secretary)	Paris
M. Fierz	Basle

A. D. Fokker	Amsterdam
E. Hutchisson	Cleveland
E. Perucca	Turin

In addition to these specialized working committees of the IUPAP, there exist a number of mixed commissions which provide a mechanism for joint action with other unions. In this connection, it is especially important to point out the achievements of the Joint Committee on Physics Abstracting and of other interested parties in bringing about a collaboration between Science Abstracts which is responsible for the abstracting of physical journals for the English-speaking countries and the *Bulletin Analytique* which does the same in French. To assist in the joint work of these two abstracting services and to speed up the publication of abstracts, the American Institute of Physics is sending to both abstracting services the page proofs of abstracts of articles published in the American physical journals, thus saving perhaps two or three months in appearance of the abstracts. It has also been agreed that for the occasional French publications, the Editor in Chief of *Bulletin Analytique* will do his best to have sent to *Science Abstracts* what information he can that will promote abstracting while the Editor of *Science Abstracts* will do the same for such publications appearing in the United Kingdom. The Joint Committee on Physics Abstracting took note that the Bureau of ICSU accepts an International Abstracting Service as a normal permanent scientific activity of the Council. After full discussion of the implications of this decision, the Commission decided unanimously to ask the Council of ICSU to dissolve the present Joint Commission and to constitute a Board for the International Abstracting Service. On this board, which would be small, would be represented the Council of ICSU, and the abstracting journals admitted as members (initially *Science Abstracts* and *Bulletin Analytique*). A secretary should be appointed by ICSU. The Commission requests that this position be taken to keep the unions concerned regularly up-to-date about the abstracting service.

The Committee also recommended to the International Council of Scientific Unions that a grant of not less than \$2,000 should be made available to the board for its work for 1952. The Committee also has asked its secretary to request the constituent unions of the Mixed Committee to contact their National Committees and the editors of periodicals to do what they can to promote the rapid transmission of journals and other information which will assist the International Abstracting Service. It is, of course, hoped that the English-speaking and French-speaking countries will not be the only ones which will participate in this International Abstracting Service. And, it is also the hope that eventually the now existing Abstracting Service will turn into French, English, and other versions of the same common international abstract bulletin.

The Joint Commission on High Altitude Stations (IUPAP, International Union of Biological Sciences, International Union of Geodesy and Geophysics, and

the International Astronomical Union) made the following recommendations of particular interest to physicists:

- (1) Unesco is urged to assist in the establishment of a high altitude research station in the Himalayas, for which a committee has already been set up in India. This region offers unique opportunities for high altitude studies in the fields of cosmic rays, astrophysics, and biology to scientific workers from all parts of the world.
- (2) Unesco can assist in establishing "World Days" for upper atmosphere research in order to provide concentrated data at special times.
- (3) Unesco is requested to consider seriously aiding the Cosmic Ray Committee of the IUPAP to support the project of the Pic du Midi Observatory, cooperating with the Universities of Brussels, Manchester and Toulouse in the establishment of unusual facilities for the study of nuclear tracks in emulsions in intense magnetic fields.
- (4) Unesco is requested to urge the continued support of the Mt. Sinai Cosmic Ray Station by the Faruk I University in Alexandria.

The next meeting of this Joint Commission is planned for the summer of 1952 in Colorado.

New representation of the IUPAP on other joint committees includes the following:

Standards and Physical Chemical Data

G. Borelius	Stockholm
H. König	Berne

Radiobiology

P. Mayneord	London
R. D. Evans	Cambridge, Mass.

Micromolecular Chemistry

J. D. Bernal	London
P. Debye	Cornell
C. Sadron	Strasbourg

Physics of Solids

G. P. Thomson	Eindhoven
R. Smoluchowski	Pittsburgh

On the remaining mixed commissions of IUPAP, the representation of IUPAP remains unchanged: Spectroscopy; Radioactivity; Rheology; Ionosphere; and Radiometeorology.

At the conclusion of the General Assembly, a new executive committee was chosen for the following three years with this membership:

N. F. Mott	President	Bristol
P. Fleury	Secretary	Paris

Vice Presidents

E. Amaldi	Rome
J. Heyrobsky	Prague
O. Huber	Switzerland
G. Borelius	Stockholm
S. V. Krishnan	New Delhi
J. C. Slater	Cambridge, Mass.
J. A. Wheeler	Princeton
M. L. Oliphant	Canberra

It was evident from the course of the meeting that the International Union of Physics offers a means for the physicists of the world to accomplish certain objectives which could be realized only with the greatest of difficulty or not at all in the absence of this Union. It is also clear that the Union is gradually increasing the scope and intensity of its activity following the difficulties of the immediate post-war years. The progress that has been made toward the creation of an International Abstracting Service is gratifying. American physicists have taken their share of the work in this direction and among them particular mention should be given to Professor Elmer Hutchisson.

It has been recognized for some time that participation of Germany—which from a practical point of view means West Germany—in the IUPAP is essential for the effectiveness of its work. All the obstacles in the way of admission of Germany have now been cleared away and all that remains to be done is to receive a letter from the appropriate national German scientific organization making application for admission.

One of the important measures taken in the post-war period to increase the effectiveness and representativeness of the International Union of Physics is to ask each member country to set up a National Committee, concerned with the International Union of Physics. This National Committee continues in existence and holds meetings every year or oftener. In this way, it furnishes a continuing liaison between the physicists of the country in question and the International Union of Physics, a liaison much more effective than that provided by the delegates to the General Assembly. The Assembly meets only every third year and the delegates are chosen ordinarily not for reasons of continuity but because they generally happen to be going to the place of meeting for other reasons anyway. On the other hand, the National Committee is ordinarily more representative in an official way of the physicists of the country in question. In the United States, the National Committee is appointed by the National Research Council and has for its chairman Dr. R. C. Gibbs, with members including representatives from the Council of the American Physical Society and other member societies of the American Institute of Physics as well as a representative of the American Institute of Physics itself.

The Union incurred a debt of gratitude to the Danish Academy of Sciences which incurred a very considerable expense in acting as host organization to the IUPAP General Assembly. The United States delegation was happy to have had the help of Mr. H. Shantz, American Chargé d'Affaires in Copenhagen and the United States State Department, in arranging an informal gathering of the delegates—the only such informal gathering in the course of the deliberations—which made it possible to establish a number of contacts and go into a number of problems of international scientific collaboration for which there was no opportunity during the formal sessions themselves.

John A. Wheeler
Princeton University