IUPAP General Report 1973

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INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS

IUPAP

GENERAL REPORT

1973

IUPAP—17

IUPAP

L'UNION INTERNATIONALE DE LA PHYSIQUE PURE ET APPLIQUÉE

IUPAP

RAPPORT GÉNÉRAL

1973

IUPAP—17

INTERNATIONAL UNION

OF PURE AND APPLIED PHYSICS

GENERAL INFORMATION

REPORT

ON THE XIVth GENERAL ASSEMBLY

WASHINGTON DC, 1972

IUPAP—17 1973

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I — ADMINISTRATION

The history of the International Union of Pure and Applied Physics is described in eight previous publications (documents IUPAP 1, 2, 4, 5, 7, 8, 10 and 14).

Essentially, the Union is composed of the National Physics Committees or groups of physicists in the various countries adhering to the Union (see center pages). Delegates from these committees meet in the General Assemblies of the Union which are held every three years. The General Assembly appoints the members of the Executive Committee, and various special committees, and nominates representatives on various interunion committees.

General Assemblies were held in Brussels (1923 and 1925), Paris (1931 and 1947), London (1934 and 1954), Amsterdam (1948), Copenhagen (1951), Rome (1957), Ottawa (1960), Warsaw (1963), Basle (1966), Dubrovnik (1969), Washington DC (1972). The Executive Committee usually meets once each year.

The Physics Union adheres to the International Council of Scientific Unions (ICSU). This Council is at present composed of 17 unions and more than 60 national members. The President of ICSU is Prof. J. Coulomb (France), and the Secretary-General is Prof. F. A. Stafleu (Netherlands). The administrative office is in Paris (51, Bd de Montmorency, 75016 Paris, France).

The General Assembly of ICSU consists of union representatives, together with national delegates. In the future, the Assembly will meet in alternate years.

In 1946, ICSU concluded an agreement with the United Nations Economic, Scientific and Cultural Organization (UNESCO) which enables the Union to receive, through ICSU, special financial grants specifically to support international conferences.

The use of funds from UNESCO for conference expenses is subject to the following conditions:

i) UNESCO may wish to send a representative to the meeting;

ii) UNESCO would like mention of its support in all relevant publications. The following wording is suggested: "Published with the financial support of UNESCO";

iii) UNESCO would like to receive ten copies of all conference reports.

Conferences and meetings of commissions are also supported from funds derived from the national members of IUPAP. These funds are also used to meet the administration expenses of the Union.
Correspondence concerning financial and national matters should be sent to the Secretary-General.
Correspondence concerning the commissions and general publicity matters should be sent to the Associate Secretary-General.

II — STATUTES

(adopted by the General Assembly of 1931 and modified by those of 1948, 1954, and 1960. The 1960 modifications are in italics).

I. Aims of the Union and Conditions of Membership

1. The aims of the Union are:

(i) the stimulation and promotion of international co-operation in Physics;

(ii) the co-ordination of the work of preparing and publishing abstracts of papers and tables of physical constants;

(iii) the promotion of international agreements on the use of symbols, units, nomenclature, and standards;

(iv) the encouragement of interesting research.

The Union may organize international meetings.

Individual nations may join the Union through their National Academies, their National Research Councils, equivalent national societies or groups of societies, or, if suitable ones do not exist, through their Governments.
Membership of a given nation through several distinct organizations is not permitted, unless these several organizations have previously agreed to share Union dues and voting rights.

The word "nation" includes dominions, diplomatic protectorates, or other territories which have an independent scientific community.

II. National Committees

2. The body responsible for initiating its country's membership in the Union will set up a National Committee, which will maintain liaison with the Union.

3. The National Committees will, in their respective countries, encourage and co-ordinate study in various fields of Physics, with emphasis on international aspects. Every National Committee may, of itself or in collaboration with other National Committees, submit to the Union for discussion problems which are within its competence.

The National Committees elect their delegates to Union assemblies. They also elect a Delegation Head who votes on the delegation's behalf on questions of administration as laid down in Articles 14 and 16.

III. Administration of the Union

4. The work of the Union is directed by the General Assembly of delegates.

5. *The Executive Committee of the Union comprises: the President, the Past President, the first Vice-President, the Vice-Presidents, and the Secretary-General. With the exception of the Past-President, the members of the Executive Committee are elected by the General Assembly; they remain in office up to the end of the ordinary General Assembly following their election. The first Vice-President replaces the President if the latter is unable to officiate.*

With the exception of the Secretary-General, the elected members of the Executive Committee may not continually occupy the same office for more than two intervals between ordinary General Assemblies.

The Executive Committee may appoint members to vacances which may occur in the Committee. Members named in this fashion will complete the term of the member whom they are replacing.

There is also set up an *administrative office* under the direction of the Secretary-General of the Union. This office deals with Union correspondence, administers Union funds, maintains archives, and organizes the preparation and distribution of those publications approved by the General Assembly.

IV. Commissions

6. The General Assembly and, subject to the approval of the next General Assembly, the Executive Committee may set up commissions pertinent to the work of the Union and may also decide to participate in joint commissions together with one or more other unions.

Union commissions include *affiliated commissions* whose activities concern certain wide fields of Physics, and *specialized commissions* which concern themselves with more specialized subjects.

Each commission must submit, through its Secretary, a report of its work to each General Assembly.

7. The constitution, statutes, activities, and financial statements of affiliated commissions must be submitted for approval to the Executive Committee of the Union. The latter has the particular responsibility of seeing that the commission's field of interest be well defined.

The Executive Committee delegates one or more of its members to represent the Union on each affiliated commission.

Affiliated commissions may, in addition to funds voted to them by the Union, collect special dues and receive grants from other sources.

8. The members of specialized commissions and the delegates of the Union to joint commissions are elected by the General Assembly which takes into consideration the suggestions of the Executive Committee. These members and delegates remain in office up to the end of the next General Assembly, and are eligible for re-election.

Specialized commissions may add members to their number subject to the approval of the Executive Committee.

The designation of members of affiliated commissions other than those delegates of the Executive Committee of the Union provided for under Article 7, is determined by the statutes of each commission.

Activities of joint commissions are governed by the International Council of Scientific Unions.

V. General Assemblies

9. Ordinary General Assemblies of the Union are held, in principle, every three years. If the date and site of a meeting have not been decided by the previous General Assembly, they are set by the Executive Committee and announced, at least four months in advance, to all members and affilites.

10. In special cases, the President may, with the approval of the Executive Committee, convene an extraordinary General Assembly; he is obliged to do so at the request of one-third of the votes of member nations.

11. All members of National Committees may attend the meetings of the General Assembly and take part in the deliberations. However, they may not vote.

The President of the Union may invite scientists who are not delegates to attend meetings of the General Assembly as consultants.

Members of affiliated commissions mentioned in Article 7 who are not delegates to the General Assembly may nevertheless take part in meetings of the General Assembly when matters concerning their commission are discussed. However, they may not vote.

12. The Agenda of Meetings is determined by the Executive Committee and issued at least four months before the opening of the Meeting. Subjects not on the Agenda may not be debated at the Assembly without the consent of half of the votes of nations represented at the Assembly.

VI. International Congresses

13. International Congresses are organized by the Executive Committee of the Union.

VII. Budget and Voting Rights

14. The Executive Committee will draft a budget estimate for each year for the period between sessions of the General Assembly. A financial commission, set up by the General Assembly, is appointed to examine each year the financial statement of the preceding year, and to study the draft budget for the next. It prepares separate reports on these two matters for submission to the General Assembly.

Following consideration of these reports, the General Assembly sets the value of one share of Union dues.* Members' annual dues are then determined by the number of shares of each country. This number is determined by the Executive Committee which takes into account the suggestions of the country's National Committee, and may subsequently be modified by agreement between the Executive Committee and the said National Committee.

The establishment or modification of the number of shares assigned to a country must be ratified by the next General Assembly.
The number of official delegates (and votes) is fixed according to the following scale:

Number of shares:	1,	2 or 3,	4 to 6,	7 to 9,	10 and more
Number of official delegates (and votes):	1,	2,	3,	4,	5

The Academy or other group responsible for a country's membership in IUPAP is also responsible for the payment of annual dues.

15. All dues which the Union receives from its member countries must be used:

(i) to pay for the cost of publications and incidental administrative expenses;

(ii) to carry out the aims outlined in Article 1.

Gifts received by the Union must be used in accordance with the wishes of the donors.

*One share was fixed at U.S. $300. from January Ist 1971.

Any country withdrawing from the Union forfeits its rights to Union assets.

16. In the course of General Assemblies, motions concerning scientific questions are carried by a majority of votes of all delegates present.

Motions concerning the administration of the Union or motions of a mixed nature will be carried by a majority of votes cast by heads of National Delegations according to Article 14.

Any doubts as to the category of the motion will be decided by the President.

At the meetings of commissions, motions are decided by majority votes of delegates and not by countries.

In all cases of tied votes, the President will cast the deciding vote.

17. A member country whose delegation will not attend a given General Assembly but wishes to vote on an appropriate matter appearing on the Agenda may send its vote in writing to the President. To be valid, it must be received before the votes on that motion be counted.

VIII. By-Laws

18. The General Assembly may pass by-laws regulating the conduct of its work, the duties incumbent on the members of the Executive Committee, or, in general, anything not provided by these statutes. Each commission may also set up bylaws governing its own activities. Such by-laws may not however contravene the Union's statutes.

IX. Deration of the Union and Modification of its Statutes

19. The life of the Union is not limited.

20. No change may be made in the present statutes without the approval of two-thirds of the votes of member countries.

21. In the event of the dissolution of the Union by a vote of the General Assembly receiving a majority of two-thirds of the votes of the member countries, its assets will be allocated by the General Assembly to one or more scientific organizations.

22. In the case of discussion as to the interpretation of the articles of the Statutes, the French text will be used exclusively.

APPENDIX A

Procedure for the Appointment of Commission Members by the General Assembly

These articles are in conformity with the Statutes. However, they are not themselves statutes but rules of procedure only. They may be adopted or changed by each General Assembly.

1. Each Commission (other than the Finance Commission) will consist of:

Chairman
Secretary
5 to 10 members.

2. Commissions will advise the Executive Committee on the appropriate size for their work. The Executive will make recommendations to each Assembly which will fix Commission sizes before elections take place.

3. *Chairmen of Commissions*

Chairmen will be appointed for 3 years, normally after 3 (or exceptionally after 6) years as secretary or as an ordinary member of their Commission. In exceptional circumstances, a Chairman may become an ordinary member of the Commission for 3 years after his period as Chairman.

4. *Secretaries of Commissions*

Secretaries will be appointed for 3 years after 3 years' service on the Commission. Secretaries will be eligible for a second, and final, cycle of 3 years. For the SUN and Atomic Masses Commissions, Secretaries may be appointed after 6 years' service on their Commission.

5. *Commission members*

Commission members will be appointed for 3 years and will be eligible for one further term of 3 years.

Exceptions to this rule will be permitted for members of Commissions which have very specialized tasks and undoubtedly have a need for some of their members to serve longer than 6 years.

6. *National Distribution of Commission Membership*

The members of each Commission (excluding Chairman and Secretary) must all come from different countries adhering to IUPAP.

The work of a few Commission may be hindered by this rule. They may present their case to the Executive and, if approval is given, the Executive will make a recommendation to the General Assembly for ratification before the elections take place.

7. *Associate Members*

Some Commissions have established valuable links with several scientific unions and other international organizations. They may wish to ask these organizations to nominate experts in these fields to become associate members of IUPAP Commissions. (IUPAP will be invited to appoint physicists as associate members of Commissions established by other Unions.)

The maximum number of associate members of any one Commission will normally be four.

Associate members are not entitled to vote at Commission Meetings nor will they be eligible for IUPAP grants towards travelling and subsistence expenses.

8. The Executive recognizes that it may not be possible to implement all these rules concerning length of service straightaway in 1972.

When new Commissions are established, *ad hoc* arrangements will need to be made until a normal rotation of membership can be established.

9. *Election Procedure for Commission Members*

9.1. National Committees and Commissions will be invited to suggest names for membership (including the offices of Chairman and Secretary) of Commissions to the Secretary-General up to *four months* before the General Assembly. Each name submitted must be accompanied by brief details of the physicist's career and post currently held, and, for names submitted by Commissions, it is desirable that the support of the candidate's National Committee should be obtained. A special form will be provided for this purpose. The Secretary-General (or Associate Secretary-General) will circulate all the names received by the deadline to National Committees 3 months before the General Assembly.

9.2. The Executive Committee will consider all the suggested names (and may itself suggest names) and will subsequently prepare, as a basis for discussion at the Assembly, a list of names for members of the Commissions.

In preparing the lists of names for Commissions, the Executive will endeavour to ensure a satisfactory world-wide spread of Commission membership. The Executive will publish their proposed list of Commission members as early as possible but not later than the beginning of the General Assembly.

9.3. After the publication of the Executive Committee's list of recommended names, it may transpire that some person may be unwilling to serve either as Chairman, Secretary or member. In this event, or if comments are received from National Committees or Commissions, the Executive Committee will make suitable proposals, e.g. they may interchange the name of one of the proposed officers with that of a proposed member or even introduce a new name. The Executive Committee's final list of names will be issued early in the Assembly in time for general discussion.

9.4. After the general discussion, individual National Delegations attending the Assembly will be able to reintroduce names from

the list of suggested names and add them to the final Executive list by *an agreed deadline* and using appropriate nomination forms. Names not on the original list may only be introduced by leave of the General Assembly. At this stage, each proposal must be seconded by another delegation. If any candidate is not a member of the proposer's nation, then the seconder should be the candidate's own National Delegation.

9.5. In the event of unforeseen circumstances (e.g. unexpected withdrawals) modifying the list of nominees after the nomination *deadline* is passed, the Secretary-General, after consultation with members of the Executive, will add such names as are necessary to complete the list. The modified list will then be presented to the General Assembly for ratification.

9.6. If more names are included on the final ratified list than the number of vacancies to be filled on one or more Commission, then secret ballots will be held. The voting procedure will be the same as the one adopted for choosing Executive Committee members. Voting must be consistent with paragraph (6.).

9.7. The procedure for filling casual vacancies on Commission which occur between meetings of the General Assembly will be the same as for casual vacancies on the Executive Committee (Statute 5).

APPENDIX B

The Sizes of IUPAP Commissions for the period 1973—75

Each Commission shall consist of Chairman and Secretary together with ordinary members, all appointed by the General Assembly. The numbers of ordinary members to be as followed:

C. 2	SUN	10 members
C. 3	Thermodynamics and Statistical Mechanics	10 members
C. 4	Cosmic Rays	8 members
C. 5	Very Low Temperature	9 members
C. 6	Publications	10 members
C. 7	Acoustics	10 members
C. 8	Semiconductors	8 members
C. 9	Magnetism	10 members
C.10	Solid State Physics	10 members
C.11	Particles and Fields	10 members
C.12	Nuclear Physics	10 members
C.13	Atomic Masses and Fundamental Constants	8 members
C.14	Education	9 members
C.15	Atomic and Molecular Physics and Spectroscopy	10 members
C.16	Plasma Physics	10 members

III. — MINUTES of the XIVth GENERAL ASSEMBLY of IUPAP WASHINGTON, U.S.A., SEPTEMBER 20—24, 1972

The Assembly met in the Auditorium of the United States National Academy of Sciences on Wednesday, Friday and Sunday, September 20, 22 and 24. The President, Professor Robert BACHER, was in the Chair for all sessions.

113 delegates had registered for the meeting. The list, by country, is given in Appendix I.

Arrangements for the meeting were made by the National Academy of Sciences, the American Institute of Physics, and the American Physical Society, coordinated by the USA National Committee for IUPAP. Chairman of the Arrangements Committee was Dr. Lewis Branscomb; chairman of the Finance Committee was Dr. Wm. Koch; chairman of the Science Programme was Dr. Wm. Havens. The Academy staff was under the direction of Dr. Hugh Odishaw, assisted by Mr. Richard Dow and Mrs. Susan Perry.
Delegates were guests at a reception given by the Academy. The dinner was tendered by the State Department of the USA, while the IUPAP banquet was tendered by the Research Corporation.

About 300 physicists in addition to the delegates attended the lectures of the science programme. Visits were arranged for delegates to the National Bureau of Standards and the Goddard Space Flight Center (NASA).

An inviting Ladies' programme was arranged by Mrs. Robert Bacher and Mrs. Herbert Friedman.

The First and Second sessions
Wednesday, September 20th
10h30 and 13h30

A –

The delegates were welcomed to Washington and the National Academy by Dr. Philip Handler, president of the Academy. Dr. E. E. David expressed his gratification at the visit of the Union to the United States. Professor Bacher also welcomed the Assembly on behalf of the United States National Committee for IUPAP, and read a message of welcome from President Nixon.

1. *Introduction*

Professor Bacher opened the meeting and read telegrams of greetings and good wishes from Professors Artsimovich of the Plasma Commission; Ambartsumian, president of ICSU; and Blokhintsev, past-president of IUPAP.

2. *Minutes*

The minutes of the XIIIth General Assembly held in Dubrovnik in 1969 were approved as printed in the General Report of 1970.

3. *Agenda*

A draft agenda had been circulated. This was commented on by the Secretary-General, who explained in detail the proposed voting procedure for elections. He noted that a secretariat was available for those wishing to distribute resolutions, etc.

On motion by Canada, seconded, the draft agenda was approved by voice vote.

Professor Kurti of the UK suggested that of the two proposed dates for the last session, that of Sunday morning be selected.

This was agreed to by show of hands.

4. *Obituaries*

The Secretary-General noted the passing of Professor Paul Huber, a former Vice-president and host at the XIIth Assembly at Basle; of Professor N. V. Fedorenko of the Atomic and Molecular Physics

and Spectroscopy Commission; and of Professor L. V. Kirenski of the Magnetism Commission. The delegates stood for a minute's silence in memory of these colleagues.

5. *Election procedures*

The document "Paper I" concerning the election procedures for Executive and Commission membership was commented on by the Secretary-General and then discussed by the Assembly. Several queries were answered and then

> *On motion by the United Kingdom, seconded, articles 1—6 (concerning the Executive) were approved by voice vote.*

It was noted by the Assembly that these articles are in conformity with the statutes. However, they are not themselves statutes but rules of procedure only. They may be adopted or changed by each General Assembly.

Discussion continued on articles concerning the Commissions. Motion for adoption was successfully amended on motion by Sweden concerning associates from various organizations.

A further amendment by the United Kingdom on article 7 concerning the presence of members from a host country on the Commission was defeated by 56 roll-call votes to 21.

An amendment by France to limit the number of associates on Commissions "normally" to four was approved by 58 roll-call votes to 17.

An amendment by Switzerland to delete mention of specific Commissions in rules was approved by voice vote.

> *On motion by Australia, seconded, articles 1—8 (concerning Commissions) were approved as amended by voice vote.*

Discussion continued on article 9. Several suggested minor modifications were permitted without motion.

> *On motion by Canada, seconded, article 9 (concerning Commissions) was approved by voice vote.*

The Secretary-General undertook to provide a new copy of the rules as amended for final review at a subsequent session (see fourth Session).

6. *Size of Commissions*

The document "Paper II" concerning the proposed sizes of Commissions was explained by the Secretary-General. The general motion for adoption was successfully amended by voice vote on proposal by the United Kingdom concerning the preliminary wording. Discussion followed on the advisability of having Commissions elect their own chairman and secretary but this idea was not supported.

An amendment by Poland to change the number of members in the Semiconductor Commission from 8 to 10 was defeated by voice vote (8 had been requested by the Commission).

> *On motion by Sweden, seconded, the document "Paper II" (concerning Commission sizes) was adopted as amended by unanimous voice vote.*

This document as amended is given in Appendix B to the Statutes in this Document (IUPAP-17).

7. *Slate for Elections*

The document "Paper III" contained suggestions made for the membership of each Commission by National Committees and Commissions, and the slate nominated by the Executive according to the rules of procedure. This had been circulated in preliminary form in June, and, as a result of comments received, re-circulated in modified form just before the beginning of the Assembly. The Secretary-General reviewed the document, offering many explanations of points raised by delegates. Some delegates advised that they would be submitting further nominations according to the rules of procedure (see Item 17).

8. *Report of the Secretary-General*

The Secretary-General reported that the routine business of the Union had been executed as usual by the London and Quebec offices.

Most of the detailed work of the Union was done by the Commissions and their Conference committees. Particular attention had been paid to giving greater publicity to the Union. The Executive had held three meetings between Assemblies and had spent much time in preparing the 50th anniversary. It had carefully studied the proposed nominating and election procedures following adverse comments by delegates on the procedures used at the XIIIth Assembly.

9. *Reports of International Commissions*

These had been circulated and will be found in Appendix II of this Document.
The reports were also presented orally by a Commission member, who sometimes added information and replied to questions from the Assembly. In particular:

C. 2 — SUN
Dr. Rudberg

> *It was suggested that the Commission circulate its proposals to National Committees and Commissions for comment before adoption. It was stated that the opinion of Physics Journals editors was also very important for practical reasons.*
>
> — Session adjourned —

B —

Following the Wednesday meetings, a short ceremony took place in the Auditorium: the unveiling of a bust by the Danish sculptor Harald Isenstein in commemoration of the 50th anniversary of the awarding of the Nobel Prize to Niels BOHR.

Brief remarks were made by Professor Larkin Kerwin who told the story of how the bust came to be commissioned; by Professor S. Rozental who described some of the features of Bohr's work; and by Professor Aage Bohr who thanked the Union on behalf of his family. The ceremony was presided by Professor Bacher.

C —

A sumptuous reception was then tendered the delegates and their wives by the National Academy of Sciences in its Great Hall.

The Third Session
September 22nd
09h00

D —

President Bacher announced that the revised version of Papers I and II would be available for the Sunday session, when elections would be held.

The Secretary-General announced that Dr. Jan NILSSON of Sweden had agreed to stand as Associate Secretary-General.

9. *Reports of International Commissions* (cont'd)

C.5 — Low Temperatures
Dr. Sugawara

The Commission was faced with problems of coordination of meetings (e.g. IIR and IUPAP in Helsinki and Moscow in 1975). The Fritz London award needed a source of funds. Possibly each LT Conference should underwrite it.

C.6 — Publications
Dr. Wolfe

The Commission's apprehension of the "SLAC" plan for organizing subscriptions to preprints with consequent by-passing of the referee system and worsening of the flood of un-refereed literature was emphasized.

C.11 — Particles & Fields
Dr. Ne'eman

This report sparked a discussion of the problem and value of Conference publications. Strong views were expressed to the effect that

they were too costly, published too late to be useful, insufficiently refereed. Suggestions were made (some of which had been successfully tried, others of which had previously been made by IUPAP):

: that only 3—4 page résumés of papers be published, and these before the conference;
: that only invited papers be published subsequently;
: that conference proceedings be only published as a special issue of a regular journal, e.g. the physics journal of host country.

The Publications Commission was requested to study this very particular problem.

C.12 — Nuclear Physics
Dr. Bell

Here the need was underlined for guidelines from IUPAP concerning co-sponsorship of Conferences by different Commissions. There had recently been a lack of communication between C.11 and C.12, now corrected. The visa problem was also a cause of anxiety. This would be taken up again under Item 14.

C.15 — Atomic and Molecular Physics and Spectroscopy
Dr. Kastler

No written report was available at the moment but Dr. Kastler gave a detailed and thoughtful review of the evolution of the atomic and molecular physics sector. The breadth of the Commission's responsibility was considerable, and thus many meetings resulted. Already the Plasma Commission had been spun off and it itself was considering a further division. Similar problems associated with rapid evolution faced the European Physical Society, which had adopted a structure analogous to ours. New fields were developing rapidly, particular Fourier transform spectroscopy, Beam-foil spectroscopy and electron beam spectroscopy. Over 5000 simple spectra remained to be examined.

"*We know practically nothing of spectra in highly-ionized heavy atoms*".

Tunable lasers for high-resolution spectroscopy were showing great promise.

C.16 — Plasma Physics
Dr. Brown

The Commission, recently formed, already saw the need for providing for further groups. It would suggest to the Executive a study of the need for a Quantum Electronics Commission in 1975.

Drs. Wilson, Wolfe, Bertaut, Sette, Bok, Rado, Wapstra, Staub, and Valerin also presented the reports of their respective Commissions, and answered questions. The texts of reports are given in Appendix II.

10. *Reports of Inter-Union activities*

Some reports had also been circulated, and were now simply tabled. They will be found in Appendix III. Some reports and additional information were presented orally. In particular:

I.1 — Committee on Data for Science and Technology (CODATA)
Dr. Vodar

Oral report. CODATA concerned itself with providing the condensed and easily available information that are data. It was now urgent to define needs, standards, and provide for exchange, a clearing house, conferences, and study of retrieval techniques. A list of eight ways in which IUPAP could assist more was presented. The "need for speed" held the risk of a careless data, and thus Commissions should oversee the quality of data presented at their conferences. The publications of CODATA, easily available from its secretariat, were not sufficiently known.

I.2 — International Council of Scientific Unions (ICSU)
See item 11.

I.3 — Special Committee on Problems of the Environment (SCOPE)
Tabled.

I.4 — Committee on Space Research (COSPAR)

To come.

I.5 — UPPER MANTLE

Tabled.

I.6 — Inter-Union Committee on Solar-Terrestrial Physics (IUCSTP)
Dr. Friedman

Oral report. This group existed for the organization and promotion of continuing work such as IGY. At the moment, the International Magnetostatic Study was under way. Greater participation by IUPAP was urged.

I.7 — IUPAC Commission on Macromolecules
Dr. Becker

This is the field of a IUPAC-IUPAP Commission. There was recently an increase of interest on the part of chemists in bringing physics techniques and theories to bear on the problems of macromolecules.

I.8 — ICSU Inter-Union Commission on Spectroscopy
Dr. Herzberg

This group had recently been inactive. This was in itself excellent, since the Commission existed to iron out difficulties and conflicts between IUPAP, IUPAC, and IUA Commissions with respect to nomenclature, etc.

I.9 — ICSU Abstracting Board
Dr. Koch

Tabled. Need for IUPAP support emphasized.

I.10 — Inter-Union Commission on Crystal Growth
Dr. Dekeyser

No activity. It was suggested that IUPAP discontinues this contact.

I.11 — Commission on Science Teaching

Tabled.

11. *Report on ICSU matters*
(deferred)

12. *Report of the Finance Commission*

The President reported that the Commission had received and examined the financial reports of the Associate Secretary-General each year, and were well satisfied with them.

However support from ICSU-UNESCO was gradually decreasing in relative importance as inter-union groups became more numerous.

13. *Recommendations of Commissions.*

Preliminary. No proposals were yet to hand.

— Session adjourned —

The Fourth Session
September 24th
09h00

5. *Election procedures* (continued)

As decided under item 5 discussed at Session I, the Secretary-General distributed the latest version of "Paper I" on election procedures, as amended by the Assembly at Session I. The Secretariat had since had to introduce further changes to make the whole coherent, and had also provided for one two unexpected contingencies. The whole was submitted for discussion and approval. Much discussion in fact took place. Motion for adoption was successfully amended on motion by Poland that reference to specific commissions be deleted from mention of general procedures (voice vote, only 1 objection).

> *On motion by the United Kingdom, seconded, articles 1—8 were adopted as amended by voice vote.*

Discussion then took place on article 9. An amendment by the USA to the motion for adoption to the effect that names other than those on the original list be considered for nomination during the last

stage of the election procedure was defeated by a voice vote. Further suggestions concerning this matter found no formal support and the President declared that the wording would thus stand as presented. Minor suggestions concerning several words were accepted by the Assembly as part of the main motion.

On motion by Australia, seconded, article 9 was adopted by voice vote.

In summing up the discussion, the President had consigned to the minutes the point that the redraft of article 9 in general and 9.4 in particular had not been intended to change the sense of the first draft discussed at session I, and in fact did not. The rules of precedure as adopted are to be found in this document as Appendix A to the Statutes.

14. *Future Union policy*

(deferred)

15. *International Conferences*

(deferred)

16. *Election of Executive Committee*

a) No further nominations having been received according to the rules of procedure, the President presented Professor Maier-Leibnitz for the office of President. The vote in favor was unanimous. Professor Maier-Leibnitz expressed his appreciation and his view that IUPAP was the "warmest" of the scientific organizations.

b) No further nominations having been received according to the rules of procedure, the President presented Dr. Clifford Butler for the office of first Vice-President. The vote in favor was unanimous. Dr. Butler expressed his thanks.

c) No further nominations having been received according to the rules of procedure, the President presented the slate of candidates for the offices of Vice-Presidents (8), Secretary-General, and

Associate Secretary-General. The voice vote was unanimously in favor. The list will be found in the center section of this Document.

17. *Election of Commissions*

a) The President announced the selection of Dr. Gordon Sutherland, Dr. E. L. Andronikashvili and Dr. Erik Rudberg as tellers.

b) No further nominations having been received according to the rules of procedure, the President presented separately to the Assembly the slate of candidates of each of the following Commissions:

C.1 — Finance
C.2 — SUN
C.3 — Thermodynamics and Statistical Mechanics
C.4 — Cosmic Rays
C.5 — Very Low Temperatures
C.6 — Publications
C.7 — Acoustics
C.8 — Semiconductors
C.10 — Solid State
C.11 — Particles and Fields
C.12 — Nuclear Physics
C.15 — Atomic and Molecular Physics and Spectroscopy
C.16 — Plasma Physics

A voice vote was taken in each case, all voice votes being unanimously in favor.

c) The Secretary-General reported a modification in the slate of C.13: Atomic Masses and Fundamental Constants, where the names of Drs. Johnson and Terrien had been interchanged in their positions as member and secretary, at the request of Dr. Terrien and with the consent of Dr. Johnson. This was proposed by the Secretary-General in accordance with the new rules of procedure. By voice vote, the Assembly approved the modified slate.

d) In the case of Commission 9: Magnetism, and Commission 14: Education, further nominations had been received on the pres-

cribed forms. In two cases, the name proposed was not included on the original list, and thus required the approval of the Assembly

On motion by Canada, seconded, it was agreed to retain the name of Dr. E. Ferreira of Brazil on the Education Commission ballot. Agreed by voice vote, one vote in opposition.

On motion of the Federal Republic of Germany, seconded, it was agreed to retain the name of Dr. Sexl of the German Democratic Republic on the Education Commission ballot. Agreed by unanimous voice vote.

Secret ballots were then cast, and the results compiled by the Tellers were announced by the President.

The complete lists of all Commissions thus elected will be found in the center section of this Document.

e) A slate of candidates to fill positions on the various interunion Commissions had been circulated at the beginning of the Assembly. Two vacancies remained: COSPAR and IUCSTP. No objection was raised to the suggestion by the Cosmic Rays Commission that Dr. B. Peters be nominated for these offices. By unanimous voice vote, the slate was approved.

The list of members will be found in the center section of this Document.

11. *Report on ISCU Matters*

The President welcomed Dr. Bhagavantam, just arrived from the ICSU Helsinki meeting. The latter reported that there had been a very long, somewhat controversial agenda. New statutes had been approved, but they much resembled the old ones, except for the creation of a much smaller Executive Committee, with a larger General Committee to meet once a year for steering purposes.

Among the various resolutions adopted were those dealing with a magnetosphere study for 1976–78, an increase in National Members dues of 30% in 1972 and 40% in 1973, a reorganization of IUCSTP, a resolution on the free circulation of scientists, the 1973 Budget (providing for $13,125 for IUPAP, a drop of $1,000), and

the suggestion that the 1974 meeting be in Turkey. Dr. Bhagavantam had himself been named chairman of COSTED.

Dr. Kastler requested that the ICSU resolution on the free circulation of scientists be distributed to the Assembly. This was done, and it is given in Appendix IV.

14. *Future Union Policy*

a) Possible Commission on Quantum Electronics.
Deferred to Item 18.

b) Resolution on the People's Republic of China.
Deferred to Item 19.

15. *International Conferences for 1973*

The Secretary-General commented on the list which had been circulated to delegates. Decisions would be taken by the Executive Committee as usual. No further comments were received.

18. *Resolutions from Commissions*

a) Dr. Brown of the Plasma Commission introduced a resolution to set up a group to study the advisability of creating a Commission on Quantum Electronics. A question as to whether such a Commission would participate in and thus dilute the Union's budget was answered in the affirmative.

On motion by the United States, seconded, it was agreed by unanimous voice vote to set up the study committee.

b) The United Kingdom introduced the following resolution:
"The General Assembly mindful of the importance of reliable and readily accessible physical data urges specialized commissions and other bodies associated with IUPAP to pay attention to the compilation and evaluation of data and to include, whenever appropriate, such activities in their agenda and programmes. It also requests the IUPAP representative on CODATA to study other possible modes of action with a view to increasing data activities within the Union."

On motion by the United Kingdom, seconded, this resolution was carried by unanimous voice vote.

19. *Resolution from National Delegations*

A resolution by Sweden initiated discussion on the possibility of the People's Republic of China joining IUPAP. ICSU had urged that countries establish as many scientific contacts with China as possible. The resolution as presented read:

"Considering the importance for the work of IUPAP of having as national member the People's Republic of China, the XIVth General Assembly of IUPAP invites and authorizes, within the framework of the IUPAP statutes, its Executive Committee to take all measures which the Committee deems necessary to achieve this goal."

On motion by Sweden, seconded by Denmark, this resolution was passed with no negative vote.

20. *Venue of the 1975 General Assembly*

This matter would be taken up by the Executive in 1973.

21. *Other Business*

a) A statement by Canada intending to be a résumé of IUPAP practice in the matter of encouraging the free circulation of scientists was circulated. It is found in Appendix V. Delegates appeared to agree that it set out the situation fairly.

b) The Israeli delegation raised for information the problem of "Russian Jewish scientists being denied visas for emigrating and subsequently being punished by being deprived of their jobs". Specific cases were named.

The Soviet delegation replied through an interpreter that the scientists in question and others in general who so wished would be allowed to leave in due course, but must await the usual time for such applications to be processed.

Since some occupied senior positions affecting the morale of their laboratories, the knowledge that they wished to leave would affect morale if they were not replaced in these positions.

President Bacher closed the discussion, reminding the Assembly of IUPAP's long-established principles on the free circulation of scientists.

c) Dr. Goldwasser raised for information three problems encountered by a recent High Energy Physics Conference:

1. Some visas issued by the USA were delayed, and intervention with the State Department had been undertaken;

2. Two Soviet Union theorists had accepted invitations but were unable to come at the last minute;

3. Papers had been received from some non-invited Soviet scientists at a very late date, when arrangements had been concluded.

These matters all involved, or seemed to, the free circulation of scientists, and made the organization of international conferences difficult.

Dr. Tuchkevich pointed out that the late issuing of visas was often responsible for the late arrival of scientific papers. The two went together. Both visas and papers should be produced well before the conference. He would inquire into the matter of Russian delegates not being able to attend. Dr. Andronikashvili mentioned other cases, but considered that individual cases should not be raised in IUPAP.

President Bacher reiterated that IUPAP followed a wellestablished policy which was in agreement with ICSU.

22. *Adjournment*

a) President Bacher delivered a much-applauded Presidential address. The text will be found in Appendix VI.

b) A moving vote of thanks was presented by Professor Amaldi. He mentioned the arrangements made by the United States National Academy of Sciences — particularly the brilliant scientific programme — and the hospitality of Dr. Handler and his colleagues.

Many of them had worked very long and hard to ensure the acknowledged success of the Assembly and the 50th Birthday of IUPAP.

Professor Amaldi also paid tribute to the efforts of President Bacher throughout three vigorous years. Retiring Secretary-General Butler had for nine years given invaluable service to the Union. Retiring Vice-Presidents Boas, Dekeyser, Bernardini, Bhagavantam and Rozental had also been unstinting in their contributions. He mentioned the work of the Quebec Secretariat.

His vote of thanks was generously applauded.

The Assembly then adjourned.

E —

Ladies attending the Assembly were offered a most interesting programme organized by Mrs. Robert Bacher and Mrs. Herbert Friedman.

F —

The IUPAP Banquet, presided by President Bacher, saw the John T. Tate Award of the American Institute of Physics for contributions to international Physics presented by Professor H. Richard Crane, Chairman, to Professor Gilberto Bernardini. After-dinner remarks were made by Dr. H. Guyford Stever.

G —

A Dinner tendered by the Research Corporation was held at the State Department, and presided by Professor Frederick Seitz. After-dinner remarks were made by Dr. James S. Coles, President of the Research Corporation, and an address on the aesthetic values of science was delivered by Dr. Robert R. Wilson.

H —

The remarkable scientific programme which was greatly enjoyed and attended not only by the Assembly delegates but also by about 300 other visiting scientists presented the following distinguished speakers: E. Amaldi; J. Bardeen; A. Bohr; H. B. G. Casimir; W. Gentner; R. W. Gould; G. Herzberg; F. Hoyle; K. S. Thorne; G. Toraldo di Francia; V. F. Weisskopf; J. Tuzo Wilson.
Québec, November 1972.

APPENDIX I

ATTENDANCE AT XIV GENERAL ASSEMBLY OF IUPAP

I. Summary:

Delegation	*Number in Delegation*
Argentina	0
Australia	3
Austria	1
Belgium	1
Bolivia	3
Brazil	0
Bulgaria	0
Canada	5
Cuba	0
Czechoslovakia	1
Denmark	2
Arab Republic of Egypt	0
Finland	0
France	11
Federal Republic of Germany	7
German Democratic Republic	3
Hungary	1
India	5
Ireland	1
Israel	1
Italy	4
Japan	2
Republic of Korea	1
Mexico	0
Netherlands	1
New Zealand	1
Norway	0
Pakistan	0

Poland	2
Romania	0
South Africa	0
Spain	1
Sweden	3
Switzerland	3
Taiwan	5
United Kingdom	7
USA	24
USSR	3
Yugoslavia	2
	Total 104

In addition, there were 6 IUPAP officials and 3 observers who were not part of a delegation who attended the General Assembly. This gave us a total of 113 who attended the IUPAP General Assembly sessions.

II. Names of Delegates and Observers

Australia
Dr. Walter Boas
Dr. John Stuart Dryden
Prof. H. Webster

Austria
Prof. Dr. Otto Hittmair

Belgium
Prof. W. Dekeyser

Bolivia
Lic. Carlos Aguirre
Ing. Ricardo Anda
*Ing. Gaston R. Mejia

Canada
Dr. R. E. Bell
Dr. Gerhard Herzberg
Prof. Paul Lorrain
Dr. G. Volkoff
Dr. J. Tuzo Wilson

Czechoslovakia
Prof. Dr. Miroslav Trlifaj

Denmark
*Prof. Aage Bohr
Prof. S. Rozental

*Chairman of delegation.

France
Prof. Jacques Badoz
Prof. Dr. E. F. Bertaut
Prof. Julien Bok
Dr. Bernard Briat
Prof. G. Delacote
Prof. B. Dreyfus
Prof. Pierre Lallemand
Madame H. Mathieu-Faraggi
Prof. Jean Charles Terrien
Prof. B. Vodar
Prof. M. Michel Voos

Federal Republic of Germany
Delegates
Prof. Dr. G. W. Becker
*Prof. Dr. Karl Ganzhorn
Prof. Dr. Hans Joos
Prof. Dr. W. Kroebel
Prof. Dr. H. Maier-Leibnitz
Dr. K.-H. Riewe

Observer
Prof. Wolfgang Gentner

German Democratic Republic
Prof. J. Auth
Dr. Herbert Friedrich
Prof. Dr. Karl Lanius

Hungary
Prof. L. Pal

India
Prof. F. C. Auluck
Prof. S. Bhagavantam
Prof. M. G. K. Menon
Prof. B. M. Udgaonkar
Dr. P. Venkateswarlu

Ireland
Prof. Declan M. Larkin

Israel
Prof. Yuval Ne'eman

Italy
Prof. Edoardo Amaldi
Prof. Bruno Brunelli
Prof. D. Sette
Prof. G. Toraldo Di Francia

Japan
Prof. Isao Imai
Prof. T. Sugawara

Republic of Korea
Dr. Chul C. Lee

Netherlands
Dr. H. F. P. Knaap

New Zealand
Dr. Ian G. Donaldson

Poland
Prof. Leonard Sosnowski
Prof. Joseph Werle

Spain
Prof. Luis Bru

*Chairman of delegation.

Sweden
Dr. Eric Dyring
Prof. Jan S. Nilsson
Prof. E. Rudberg

Switzerland
Prof. Dr. Heini Granicher
Prof. Dr. Andre Mercier
Prof. Hans H. Staub

Taiwan
Delegates
Dr. Ching-Tang Chen-Tsai
Prof. Chun-Shan Shen
Dr. Wei-Noon Wang
Dr. Ta-You Wu

Observer
Mr. Hsuen-Chang Pan

United Kingdom
Delegates
Prof. George R. Bishop
*Prof. Nicholas Kurti
Dr. R. S. Pease
Prof. W. C. Price
Prof. J. G. Wilson

Observers
Prof. L. F. Bates, F.R.S.
Sir Gordon Sutherland

USA
Delegates
Dr. D. Allan Bromley
*Prof. Sanborn C. Brown
Dr. Edwin L. Goldwasser
Dr. W. W. Havens, Jr.
Dr. Frederick Seitz

Alternate Delegates
Prof. Stanley S. Ballard
Dr. John Bardeen
Dr. Lewis M. Branscomb
Dr. Milan D. Fiske
Dr. Martin Greenspan
Dr. H. William Koch
Dr. Roman Smoluchowski

Observers
Dr. E. Richard Cohen
Dr. Hsu Y. Fan
Dr. Joseph L. Fowler
Dr. Conyers Herring
Dr. I. Hirsh
Dr. Walter H. Johnson, Jr.
Dr. William C. Kelly
Dr. Hugh Odishaw
Dr. Simon Pasternack
Dr. George T. Rado
Dr. F. Dow Smith
Dr. Hugh C. Wolfe

USSR
Dr. Eleveter Andronikashvili
Dr. Vasiliy D. Badakayev
*Dr. Vladimir M. Tuchkevich

Yugoslavia
*Prof. Aleksandar Milojevic
Dr. Milorad Mladjenovic

*Chairman of delegation.

III. IUPAP Officials

President: Prof. Robert F. Bacher (USA)

First Vice-President: *Prof. H. Maier-Leibnitz (FRG)
Vice-Presidents:

Prof. G. Bernardini (Italy)
*Dr. S. Bhagavantam (India)
*Dr. Walter Boas (Australia)
*Prof. Dr. W. Dekeyser (Belgium)
Prof. Alfred H. Kastler (France)
*Prof. L. Pal (Hungary)
*Prof. S. Rozental (Denmark)
Prof. Victor Weisskopf (USA)

Secretary-General: Dr. C. C. Butler (UK)

Assoc. Secretary-General: Prof. Larkin Kerwin (Canada)

IV. Observers not included in National Delegations

Prof. Donald D. Betts (Canada) — member of Commission on Thermodynamics and Statistical Mechanics

Prof. H. B. G. Casimir (Netherlands) — member of Commission on Physics Education

Dr. Herbert Friedman (USA) — Representative from IUCSTP

*Also listed above as delegates.

APPENDIX II

Reports by Commissions

Specialized Commissions:

1. Financial Commission
2. Commission for Symbols, Units and Nomenclature
3. Commission on Thermodynamics and Statistical Mechanics
4. Commission on Cosmic Rays
5. Commission on Very Low Temperature Physics
6. Commission on Publications
7. Commission on Acoustics
8. Commission on Semiconductors
9. Commission on Magnetism
10. Commission on Solid State Physics
11. Commission on Particles and Fields
12. Commission on Nuclear Physics
13. Commission on Atomic Masses and Fundamental Constants
14. Commission on Physics Education
15. Commission on Atomic and Molecular Physics and Spectroscopy
16. Commission on Plasma Physics

Affiliated Commission:

17. International Commission for optics

1. Financial Commission — No written report

2. Commission for Symbols, Units and Nomenclature (SUN)

The SUN Commission has the task to promote unification in the use of symbols for quantities and units and in the nomenclature and terminology used in physics publications and teaching.

The SUN Commission collaborates with various international organisations active in the same field, in particular with the IUPAC (especially IUPAC/STU), the Comite International des Poids et Mesures and its Comite Consultatif des Unites, the International Organisation for Standardisation (especially IEC/TC 24 and 25).

One of the main activities were advice to and cooperation with the above-mentioned international organisations, with the aim to giving a clear understanding and a widespread application of the International System of Units (SI), as established by the relevant bodies of Metre Convention, and to selecting units not belonging to the SI units and their decimal multiples or submultiples for usage together with the SI for an unlimited time or during a transitory period.

From special problems, as discussed and solved together with the above-mentioned international organisations, should be mentioned here the following.

In the field of computers and information processing the representation for SI and other units to be used in systems with limited character sets, especially recommendations regarding two different sets of representation and the principle conditions for their application — in this field a rather satisfactory compromise could be found.

The presentation of logarithmic quantities (e.g. loss, gain, level, frequency interval, decision content, information content) in the frame work of normal quantity calculus together with the belonging units for those dimensionless quantities — with this subject still remain not yet overcome discrepancies of point of view between IEC and the other organisations.

Acknowledging and establishing the distinction between the dimensional independence and the metrological independence of base units — dimensional independence being a property of the base units as the base of an algebraic structure in the sense of the theory of sets in connection with quantity calculus, whereas metrological independence means the degree of independence in experimentally realising base units in a National Standardising Laboratory.

Adaptation of nomenclature and symbolism in the special field of thermodynamic energetic functions between IUPAC and IUPAP.

In collaboration with interestee above-mentioned international organisations drafting a new chapter *Plasma Physics*, widely enlarging and rearranging the chapter *Solid State Physics* completely revising the Appendix *Systems of Quantities and Units in Electricity and Magnetism* of the IUPAP/SUN document, which is leading at the same time to a simplification as well as adaptation to the practical needs of today. Details are contained in documents submitted by the Commission to the XIVth General Assembly for approval.

The future work of the SUN Commission for the next two or three years is, in further close cooperation with other international organisations engaged in this field, accomplishing the adaptation of the concepts, nomenclature, and symbolism needed in pure and applied physics to the present situation with the aim to submit to the XVth General Assembly a completely revised new edition of the IUPAP/SUN document, if the XIVth General Assembly agrees to this intention.

SUN Commission has been represented at the meetings of corresponding commissions or committees of other international organisations active in an analogous field.

During the three year cycle 1969—1972 the SUN Commission answered many written questions from individuals in science and technology and met three times: 9 and 10 September 1970 at Dubrovnik, 19 and 20 August 1971 in Paris, and 29, 30 and 31 August 1972 in Paris.

3. Commission on Thermodynamics and Statistical Mechanics

During the period 1969—1972 the Thermodynamics and Statistical Mechanics Commission sponsored altogether four conferences. In chronological order these were:

1. The international conference on Thermodynamics held in Cardiff, 1—4 April 1970. This conference was sponsored in addition by IUPAC. It was attended by about 180 scientists and covered topics ranging from statistical thermodynamics to pedagogical aspects of thermodynamics.

2. International Conference on Statistical Mechanics held in Chicago, 29 March—2 April 1971. This meeting, one in the series of international conferences on Statistical Mechanics, held every two years, was attended by about 300 physicists active in the field. It provided a rather complete survey of the current activities and developments in Statistical Mechanics.

3. The third international conference "de la Physique Theorique a la Biologie" organised by the Institut de la Vie at Versailles, 21—26 June 1971. The admission to this conference was by invitation only. It was attended by approximately 80 theoretical physicists, chemists, biologists, physiologists and mathematicians, and was once more most successful in confronting the points of view of various disciplines relevant for biological problems.

4. The "100 years Boltzmann equation symposium" held in Vienna 4—8 September 1972. The program of the conference is set up in such a way as to give a survey of the historical developments, the recent progress and the unsolved problems in kinetic theory. The admission is by invitation.

The Commission met in Paris on April 19, 1971, to discuss changes in its membership, as well as sponsorship of future conferences.

During 1973 the Commission wishes to sponsor two meetings:

1. Fourth conference on Theoretical Physics and Biology at Versailles, 27 May—2 June, 1973. The admission to this conference will be by invitation only. No funds are required from IUPAP.

2. An international conference on Statistical Mechanics at Amsterdam in September 1973 on the occasion of the centenary of the Van der Waals equation. The organiser is Professor N. Trappeniers, Van der Waals Laboratorium, University of Amsterdam, Valckenierstraat 67, Amsterdam.

The Commission intends to meet during this conference.

List of conferences sponsored by the Thermodynamics and Statistical Mechanics Commission during the period 1969—1972.

1. International conference on Thermodynamics, Cardiff, 1—4 April 1970, cosponsored by IUPAC.

Organiser: Professor P. T. Landsberg, Cardiff.
Proceedings published: Thermodynamics, Cardiff, Butterworth's 1970.
Not subsidised by IUPAP.

2. International conference on Statistical Mechanics, Chicago, 29 March—2 April, 1971.
Organiser: Professor Stuart A. Rice, The James Franck Institute, University of Chicago.
Proceedings to appear: Chicago University Press.
IUPAP grant: $ 5000.

3. Third Conference from Theoretical Physics to Biology, Versailles, 21—26 June 1971.
Organiser: Professor M. Marois, Institut de la Vie, 89 Bd. St. Michel, Paris 5e, France.
Proceedings: not yet published.
Proceedings of 2nd conference Versailles (30.6—5.7.69) published: Institut de la Vie, "From Theoretical Physics to Biology" Ed. du Centre National de Recherche Scientifique, 15 Quai Anatole France — Paris 7e.

4. Hundred Years Boltzmann-Equation Symposium, Vienna, 4—8 September 1972.
Organising Committee: Professor E. G. D. Cohen (New York)
Professor W. Thirring (Vienna)
Professor H. Wergeland (Trondheim).
IUPAP grant: $ 1000.

4. Commission on Cosmic Rays

The main activities of the Cosmic Ray Commission during the cycle 1969—1972 concerned the organisation and evaluation of the 12th International Conference on cosmic rays held at Hobart. This meeting was arranged with some trepidation on the grounds that sooner rather than later the conference ought to go to Australia. In the event it was highly successful. The attendance was fully representative of cosmic ray physics throughout the world, the only area rather more poorly represented than usual being Europe; even from Europe, however, there was a quite adequate attendance.

The Conference developed further the scheme of pre-presentation of papers first attempted two years earlier at Budapest. As a result the publication of short versions of contributed papers was completed in six volumes at the outset of the conference and lecturers were able to direct their attention to stressing important features and making points of clarification. The conference took place in August 1971 and the remainder of the publications, which will be based upon invited papers and rapporteur papers, is not yet in my hands.

The Commission met during the conference and had before it its own resolution that the 13th conference should take place at Denver in 1973, and proceeded to allocate the 14th conference to Germany who expect to mount it in or near Munich.

The Commission does not expect to submit any resolutions for consideration at the Washington Assembly.

5. Commission on Very Low Temperature Physics

A. Conferences sponsored and Proceedings: The main purpose of the Commission is to help plan and sponsor a series of international conferences on low temperature physics (LT Conferences).

1. LT 12 (Kyoto), Conference on Transport on Solids. The twelfth of the LT series, LT 12, was held in Kyoto, Japan, 4—10 September 1970. The number of participants was about 1000. The Fritz London Award was presented to Dr. B. Josephson, Cambridge University, for his distinguished work in low temperature physics. Proceedings of this conference were published in one volume (895 pages) in 1971 by Keigaku Publishing Co., Tokyo (Japan), edited by E. Kanda. A satellite conference on Transport in Solids was held in connection with LT 12 and sponsored also by IUPAP. It was held in Sydney, Australia, 26—29 August 1970.

2. LT 13. This conference is to be held at the University of Colorado, Boulder, USA, 21—25 August 1972. The Chairman of the Organising Committee is Dr. R. H. Kropschot, National Bureau of Standards, Boulder, Colorado.

3. Conference on Sciences of Superconductivity. This international conference was held at the Stanford University, Stanford, USA, 26—29 August 1969. Proceedings were published in 1972 in one volume (808 pages) by North-Holland Publishing Co., edited by F. Chilton.

4. Conference on Quantum Crystals. This conference was held in Banff, Canada, 6—10 September 1971. It was sponsored by IUPAP with no financial support.

B. Future Conferences: The Commission favours going to a three-year cycle of LT Conferences after 1972. The next LT Conference, LT 14, will be held in 1975, probably in Europe. The site and the nature of this conference will be discussed at the Commission Meeting to be held in Boulder, August 1972.

C. Meetings of the Commission: A meeting of the Commission was held in Kyoto, 8 September 1970, in connection with LT 12. At this meeting the site for LT 13 and LT 14 and other problems were discussed. The University of California at La-Jolla was chosen for the site of LT 13 (1972).* As to the site for LT 14 (1975), invitations were received from Helsinki and Haifa, but the final decision has been postponed to the 1972 meeting. Discussions were also made on the prospect and financial problems of the helium conservation program in USA. The Commission decided to send to Secretary-General a statement suggesting international support for helium conservation. The next meeting is to be held in Boulder, 24 August 1972.

D. Cooperation with other organisations: The Commission has been keeping close relation with international bodies in related areas. At the 1970 Meeting in Kyoto, O. V. Lounasmaa was appointed as the liaison member with the Commission 1 of the International Institute for Refrigeration, IIR. The former liaison member was N. Kürti.

6. Commission on Publications

The Commission held one meeting during the 3 year period at the CNRS in Paris on 12 May 1972.

*Later, this was changed to the University of Colorado, USA, because of delays in construction of buildings at La Jolla and other factors.

1. The Commission made recommendations for membership during 1972—1975.

2. Journal Program of the European Physical Society: Dr. Coles reported that EPS has approved a list of journals for designation as Europhysics Journals, on the basis of criteria for international editorial boards, regular refereeing procedures, etc. They must accept papers in any of three languages and must provide an abstract in English for each paper. The only commercially published journals included so far are PHYSICA and THE PHILOSOPHICAL MAGAZINE. No "letters" journals are included as yet. It is planned to use the specialist divisions of EPS in monitoring the commercial "international" journals in specialised fields. No "review" journals have been included as yet. The CZECHOSLOVAK JOURNAL OF PHYSICS has dropped the Europhysics label. Although the Soviet Union participates in EPS, no Russian journals are in the Europhysics list.

A new Style Manual has been prepared and will soon be printed in EUROPHYSICS NEWS.

3. The Current Physics Information system of the American Institute of Physics:

Supplementing brochures which had been mailed to the members earlier, Dr. Wolfe distributed copies of an article by Dr. H. W. Koch from SCIENCE, Nov. 1971 and an article by Dr. A. Herschman from PHYSICS TODAY, Nov. 1971. AIP is now producing and marketing a set of four secondary services to supplement its primary journal publication program.

a) CURRENT PHYSICS ADVANCE ABSTRACTS (CPAA): a monthly publication in 3 sections, providing abstracts arranged by subject classification of articles accepted for publication in AIP journals.

b) SEARCHABLE PHYSICS INFORMATION NOTICES (SPIN): a magnetic tape with title, author, abstract, cited references indexing and bibliographic data, covering about 70 journals.

c) CURRENT PHYSICS TITLES (CPT): a monthly publication in three sections, photocomposed from the SPIN tape and arranged by subject classification, giving title, author and bibliographic data.

d) CURRENT PHYSICS MICROFORM (CPM): a monthly microfilm containing the complete text of all journal issues published by AIP during the preceding month. The reel and frame number for each article is included as part of the data in SPIN and CPT.

The list of selected journals in SPIN and CPT was discussed and it was moved, seconded and carried: that the Commission on Publications recommends to AIP that all journals selected as Europhysics journals by EPS be included in SPIN and CPT.

Note added by H. C. W. Unless the list grows in such a way as to complicate unduly the cooperative arrangements between AIP and the Institution of Electrical Engineers, the publishers of PHYSICS ABSTRACTS, AIP sees no difficulty in complying with this request. AIP does not include journals other than those it publishes in CPM but encourages their publishers to arrange for similar microform output and to provide reel and frame numbers for SPIN and CPT. Questions were raised about duplication of effort between AIP and IEE. Dr. Wolfe pointed out that much attention has been given to cooperation, with each marketing the products of the other, and with each supplying to the other the inputs it generates. CURRENT PAPERS IN PHYSICS is not sectionalised and does not seem to AIP to fill the role of CPT, so there is some competition between them at present but it is hoped that they may be combined before too long.

4. Classification and Indexing of Physics Literature: AIP and IEE (INSPEC) have been working for some years on bringing their classification schemes into accord and a working group of the ICSU Abstracting Board is coordinating the effort to obtain a common classification scheme for all physics secondary journals. The combined AIP/INSPEC scheme was submitted to ICSU/AB in March 1972. Mr. Bretnütz reported that Physikalische Berichte tries to follow the classification scheme used by INSPEC but that this seems to be

more difficult for the multidisciplinary abstracting journals, Bulletin Signalitique and Referationyi Zhurnal.

The EPS Style Manual recommends that authors classify their papers in accordance with the scheme used by INSPEC and referees are asked to specify their areas of competence according to the same scheme. Most of the journals published by AIP use the AIP classification and indexing scheme. Dr. Pasternack was asked whether PHYSICAL REVIEW, which does not now use it, will follow this scheme for indexing in 1973. He reported that studies are underway to compare 1971 indexes prepared both ways as a basis for decision. Mr. Pedersen reported that the journals of the Institute of Physics are indexed by the INSPEC staff under a contract.

5. Composition and Printing Techniques: Mr. Pedersen reported that the IOP journals use Monophoto composition, which they find cheaper and more flexible than Monotype although corrections are more expensive, and offset printing. Mr. Bretnütz reported that Physikalische Berichte is printed by offset, using typewriter composition for abstracts and computerised photocomposition for indexes. Dr. Wolfe reported that essentially all AIP journals are printed by offset. An increasing number use typewriter composition with some set by monotype or computerised photocomposition. Since the "head" of each article (title, author, abstract) and the "tail" (cited references) have to be keyboarded for the SPIN tape, plans are underway to print these parts by computerised photocomposition and combine them with the typewriter-composed (or monotype) text, avoiding duplication of keyboarding.

6. Bibliographic References: It was reported that ICSU/AB and UNISIST have a combined group working on a standard format for bibliographic references to facilitate information interchange.

Subcommittee 4 of Committee Z-39 of the American National Standards Institute is also developing such a standard.

7. Journal Title Abbreviations: The ICSU/AB has agreed to follow the title abbreviation list developed and maintained by Z-39.

8. Coden: The matter of using 5-letter codens (developed by ASTM) or the serial number coding scheme developed by Z-39/SC-20 to

designate journals has not been resolved in the US, so AIP does not print either on its journals, although codens are used internally in physics information activities. The IOP journals have agreed to carry the coden designations if they are requested to do so by INSPEC.

9. SI Units: Dr. Wolfe reported that the SUN Commission of IUPAP has cooperated with ISO/TC 12 in producing Draft International Standard 1000 "SI Units and Recommendations for the Use of their Multiples and of Certain Other Units". The use of SI units and their standard symbols for all data in physics journals is recommended.

10. Preprint Distribution: Many authors distribute preprints of their papers and this practice is accepted by the Commission. The only current organised preprint system is PREPRINTS IN PARTICLES AND FIELDS operated by SLAC (Standford) and CERN. A weekly sheet lists preprints received by SLAC and CERN and, in many cases, by preprint libraries operated at high energy physics centers. An "anti-preprint" list is published about once a month, giving bibliographic references for published papers originally listed as preprints. An individual may obtain a Xerox copy of a preprint from his preprint library or may request one from the author.

Dr. Pasternack reported that SLAC proposes the distribution of preprints to subscribers at $ 100 per year with a $ 2 per page publication charge to authors. After discussion, it was moved, seconded and carried unanimously that:

The Commission feels that the printing and distribution of preprints on a subscription basis would constitute their unedited and unrefereed publication and, as such, would be a serious departure from normally accepted practices in physics publication.

Dr. Pasternack also reported a request that journal articles, which have been made available as preprints carrying report numbers, should carry footnotes saying something like "supersedes UCRL 2794". The Commission had no objection to this and felt that it might be helpful.

11. Financial Problems of Journals: Mr. Pedersen reported a 50% increase in two years in the number of pages published in IOP jour-

nals, bringing financial strains associated with increased staff, etc. The concensus was that few other journals had grown at this rate recently. Dr. Wolfe reported that there has been a drop off in acceptance of page charges in AIP journals, due to cutbacks in government support of research, etc. Quotas of pages that can be published without payment of page charges have been established and some papers are being delayed by as much as 14 months. AIP is not happy about this but finds it essential for economic stability.

7. Commission on Acoustics

During the term 1969—72 the activity of ICA has been closely followed by the three Scientific Unions: IUTAM, IUPS, IUBS and the Biophysics Union. The first three of them have named an official observer.

Meetings of the Commission. Four meetings of the Commission were held: 5—6 May 1970 in Budapest (Hungary); 18—20 August and 25 August 1971 in Budapest; 3—4 May 1972 in Paris. A joint meeting of ICA with representatives of Acoustical Societies was held on August 20, 1971 in Budapest. Moreover the Chairman and the Secretary of ICA have been present to the first (constitutional) meeting of the Federation of European Acoustical Societies (Paris, 5 May 1972).

The Seventh International Congress. The Seventh Congress held in Budapest (18—26 August 1971) has been the major activity of the Commission in the present term. It was the first congress organised by the Commission in which a large participation of Acousticians of Socialist Countries was possible: 435 out of a total attendance of 1,530. The Countries represented were 34. The scientific sessions included the presentation of 14 invited papers and 627 contributed papers. Round table discussions were organised on 10 important issues. The papers were delivered in English (64%), German (23%) and French (13%). The proceedings of the Conference have been published in 4 volumes of about 3000 pages total. During the Congress an exhibition of acoustical and electroacoustical apparatus and of books was held: Hungarian enterprises presented their products. Visits to factories and special demonstrations were organised.

In connection with the main congress two specialised symposia were held: the first was devoted to Speech, the other to Noise Prevention.

The major burden of the organisation of the congress was undertaken by the Hungarian Organising Committee led by Professor T. Tarnoczy, a member of ICA. The Commission has however dedicated to this organisation a great attention during the last two years before the meeting by assisting the Hungarian Committee.

The cost of the congress has been evaluated to 82,000 USA dollars. They were covered in a small part by the entire IUPAP contribution for ICA, activities in the three years, by the registration fees (38,000$), and by the help of the Hungarian Government and enterprises. All participants received the proceedings. The excellent organisation of the large congress was due to the continuous and effective help of Hungarian Authorities and the enthusiastic effort of Hungarian Acousticians. The Hungarian Academy has also helped by taking care of the publication of the proceedings. A certain number of copies of these are in deposit at the Academy and can be purchased from the Academy distributor: Kulture, Budapest 62.

During the Congress two meetings of representatives of Acoustical Societies and Commissions were held: to the first all Acoustical Societies and Commissions were invited to exchange information and try to coordinate action. Only European Acoustical Societies were present at the second meeting; a group of Societies have proposed a draft statute of a Federation for organising cooperation among Societies and the Commission; it has been discussed in detail and a Steering Group has been charged with preparation for the constitution of the Federation of Acoustical Societies of Europe (FASE)

Organisation of the 8th and 9th ICA Congresses. The Commission is at present taking care of the organisation of the 8th ICA Congress. It will be held in London in July 1974. Although open to all sectors of Acoustics it will try to underline in particular the problems of "Environmental Acoustics". It will have satellite symposia on Microwave Acoustics, Underwater Acoustics and Transportation Noise. The Commission has also started the organisation of the 9th Congress which will be held in Madrid (Spain) in the summer of 1977 and will

be the first one organised by the Commission in a Spanish speaking country.

Meetings connected with the IUPAP Assembly. ICA has stimulated the organisation of meetings connected with the IUPAP Assembly in Washington. Through the collaboration of the Acoustical Society of American two of such meetings have been organised: a symposium on the "Atmospheric sound propagation" at NBS (September 27—29) and the Inter-noise 72 Conference in Washington (4—6 October).

Information and Coordination Service. The Commission decided in 1969 to organise a service for collecting information on acoustic meetings in different countries and for diffusing this information by sending periodic lists of events to Acoustical Societies, Acoustic Journals and other organisations interested in Acoustics. This service has been undertaken by Dr. Kolmer, a Commission corresponding member, with the help of the Czechoslovakian Academy. The same service is also collecting and distributing information on European Laboratories where research in Acoustics is carried on. A further action of this center refers to the diffusion of information on the organisation, status, activities of each national Acoustical Commission or Society. The request of this activity came out during the meeting with the representatives of Acoustical Societies organised by ICA during its 7th Congress in Budapest.

Cooperation with Acoustical Societies and help with the organisation of a European Federation. ICA has usually called meeting of representatives of National Societies and Commissions during its Congresses. In Budapest the meeting discussed the activities of ICA, how to improve the exchange of information and the coordination of activities of various Societies, the problems which are at present of particular importance for the development of Acoustics. We have already quoted same action which resulted from this meeting in the field of exchange of information. The meeting pointed out also the great importance that the problems of noise pollution has at present and gave support to ICA action in this direction.

Man and his environment. ICA has been considering for a long time the importance of the problems connected with the environment: it

has had some of its members collaborating with ISO subcommittees on noise and architectural acoustics. In the last two years it has increased its activity in this field and it is collaborating in the effort that the UN are conducting on the "Human Environment": as it is known the UN have been organising for a long time the Conference on the subject in Stockholm (June 1972).

ICA has asked to participate and one of its members (Dr. Mattei) has participated to a meeting organised by the European Economic Commission in Prague in May 1971 as a preparation of European Countries to the Stockholm Conference. In this meeting the problems of noise, considered as a part of air pollution, have been presented. ICSU has organised a special group, SCOPE, to study the problem of environment, and IUPAP has appointed as its representative in this group Dr. Lara of ICA. Dr. Lara has been charged by SCOPE to prepare a report on the noise problem and ICA has appointed a small group of experts to assist Lara prepare a draft of this report. Due to the SCOPE procedures the final report will be ready in January 1973.

ICA, however, in order not to lose the unique opportunity of the Stockholm Conference (a Governmental Conference) for addressing to the Governments and calling their attention to the importance of considering noise aspects in their decisions on planning and of issuing adequate regulations concerning noise as well as to the need of supporting research on noise problems, has sent directly to the Stockholm Conference a document calling for resolutions to be adopted.

Financial Matters. The activity of the Commission has increased in the last term as shown above. The financial problems have become more acute. The operation at the level described has been possible only because the members have agreed to participate in meetings with a very low contribution to their expenses, or, more frequently, with no contribution at all, and they have found elsewhere funds for the activities that ICA has asked to them to perform. The low budget of the Commission, although ICA has given larger contributions to members moving from other continents that the place of the meeting, discriminates against some members. From the other side the great interdisciplinary nature of Acoustics requires direct discussion of

problems in meetings and the participation in them of a large part of Commission Members.

Appendix to ICA report (1969—72)

The Commission has organised the 7th ICA Congress in Budapest (Hungary) 18—26 August 1971.
The Proceedings of the Congress have been published by "Akademiei Kiado" Budapest in four main volumes and one abstract volume.
The total number of pages is of 3006.
The proceedings were distributed to all participants.
Extra copies can be purchased from "Kulture", Budapest 62, an agency of the Hungarian Academy.

ICA has also sponsored the following two meetings:

1) Symposium on Atomspheric sound propagation at NBS (Gaithersburg) 27—29 September 1972.

2) Internoise — 72 Conference (Washington 4—6 October 1972).

8. Commission on Semiconductors

1. *International Conferences on the Physics of Semiconductors* (type A)

a) The 10th Conference was held at the Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, 17—21 August 1970. Attendance 700. The Commission members were very satisfied with the scientific program which achieved a very good balance of high quality papers over the whole semiconductor field. The proceedings were published in December 1970. Editors S. P. Keller, J. C. Hensel and St. Stern, Atomic Energy Commission, Washington D. C. 1970.

b) The 11th Conference will be held in Warsaw, Poland, 25—29 July 1972. An International Committee was set up to decide the scientific program and to select the papers. A full report of the conference will be given later.

2. *Topical Conferences* (type B)

— International Conference on Photoconductivity, Stanford, USA,

12—15 August 1969. Proceedings of the 3rd International Conference on Photoconductivity. Editors E. M. Pell, Pergamon Press 1971.

— Conference on Heterojunctions and Layer Structure, Budapest, Hungary. 11—17 October 1970. Editor G. Szigeti, Akademiai Kiado, Budapest 1971.

— International Symposium on Radiation Effects in Semiconductors, Albany, USA, July 1970. Editors James Corbett and George Watkins. Gordon and Breach Science Publishers, New York, NY (USA).

— International Conference on Radiation Damage and Defects in Semiconductors, Reading, UK, 19—21 July 1972.

International conferences on Amorphous and Liqued Semiconductors.

This field was rapidly developing these last years and an International Committee was set up which recommended conferences on that subject on a two-year periodicity. The conferences held during the 1969—1972 period were:

— 3rd Conference on Amorphous and Liquid Semiconductors, Cambridge, UK, 24—27 September 1969. Proceedings of the International Conference of Amorphous and Liquid Semiconductors, Editor N. Mott, North Holland 1970.

— 4th Conference on Amorphous and Liquid Semiconductors, Ann Arbor, Michigan, USA, 8—13 August 1971. No proceedings have been published.

— The 5th Conference is planned for the summer of 1973 in Garmisch-Partenkirchen, (German Federal Republic).

3. *Meetings of the Commission*

The Commission met in Cambridge, USA on August 17th 1970. The minutes of this meeting were sent to the Secretary-General in October 1970.

The next meeting will be held in Warsaw in July 1972.

4. *Budget*

The allocation for the 1969—1972 period was originally $ 8000; after a request from the Secretary of the Commission this allocation was

raised to $ 12000, of which $ 1000 are part of the allocation for the 1973—1975 period. The allocations to the meetings were the following:

Cambridge (USA) Conference	(1970) — $ 5000
Albany meeting	(1970) — $ 500
Budapest meeting	(1970) — $ 1500
Warsaw meeting	(1972) — $ 5000

9. Commission on Magnetism

1. *Summary*

During the period 1969—1972, as in the preceding three years, the activities of the Magnetism Commission centered around the triennial Commission Meeting and the triennial International Conference on Magnetism (ICM). Both of these events took place in 1970 in Grenoble, France, and are briefly described below. The Commission sponsored, in addition, two "satellite" conferences of the 1970 ICM and two other conferences. All of these conferences are listed in Appendix A, which includes information on publications and financial support. During this three-year period, as in earlier ones, the entirety of the IUPAP funds at the Commission's disposal has been used to support the ICM.

2. *The 1970 Meeting of the Magnetism Commission*

The major part of the meeting was devoted to the then current 1970 Grenoble ICM (see Sec. III), to a report on preparations for the 1973 Moscow ICM, and to a lengthy discussion of the visa problem. Among the Commission's other actions, the most important ones were its decision to hold the 1976 ICM in Amsterdam, Holland, and its recommendation that an international program committee should be organised formally in conjunction with all ICMs to be held in 1976 and thereafter.

3. *The 1970 International Conference on Magnetism*

The 1970 Grenoble ICM is generally considered to have been a great success, its 84 scientific sessions reflecting the continued vitality of the field of magnetism. Of the almost 1200 participants, about two-thirds came from 30 countries other than France. In addition to 48 invited papers, a total of 705 were submitted. The Program Committee accepted 476 (i.e. only about 68%) for presentation, and then included, with the authors' concurrence, 425 of these in the Conference Proceedings which were subsequently published in two volumes of the Journal de Physique.

4. *Additional Information*

Additional information on Secs. II and III is given in the Secretary's 15 June 1970 and 7 July 1971 reports to Dr. Butler, and further details may be found in the Minutes of the 1970 Meeting of the Magnetism Commission (distributed on 27 April 1971) and in the references of Appendix A of the present report.

APPENDIX

(to Magnetism Commission Report)

Recommendations of the Magnetism Commission During 1969—1972 for IUPAP Sponsorship or Co-Sponsorship of Conferences

(List prepared on June 7, 1972)

Note: Conferences marked with an asterisk (*) have already been granted IUPAP Sponsorship or Co-Sponsorship by the Executive.

Category	Title of Conference	Place and Date	IUPAP Support	Published Proceedings	Remarks
A	International Conference on Magnetism*	Grenoble, France Sept. 14–19/70	$ 5000	See Reference 1	
C	Density of Electronic Charge and Spin*	Aussois, France Sept. 7–12/70	None	None	"Satellite" of '70 Grenoble Conference
C	Fourth International Colloquium on Magnetic Thin Films*	Prague, Czechoslovakia Sept. 21–23/70	None	See Reference 2	"Satellite" of '70 Grenoble Conference
B	Fourth International Symposium Magnetic Resonance*	Rehovot, Israel Aug. 24–31/71	None	See Reference 3	Also sponsored by IUPAC
C	Symposium on the Physics of Dense Matter*	Copenhagen, Denmark After Aug. 1972	None		Co-sponsored by IAU

Category	Title of Conference	Place and Date	IUPAP Support	Published Proceedings	Remarks
A	International Conference on Magnetism	Moscow, USSR Aug. 22–28/73	More than $ 5000 requested		
C	Sagamore IV: Electronic Charge, Spin and Momentum Density	Minsk, USSR Aug. 12–17/73	None		"Satellite" of '73 Moscow Conference
C	Sixth International Colloquium on Magne- Thin Films	? USSR ?	None		"Satellite" of '73 Moscow Conference
B	Fifth International Symposium on Magnetic Resonance	Bombay, India Jan. or Feb. 1974	None		

Reference 1: Journal de Physique, Colloque C1, Supplement to Nos. 2–3, Volume 32, February–March 1972, pages C1–1 to C1–1210.

Reference 2: Czechoslovak Journal of Physics, vol. B21, No. 4–5, pages 329–590, 1971.

Reference 3: Invited papers: Pure and Applied Chemistry (to be published). Contributed papers: Journal of Magnetic Resonance (to be published).

10. Commission on solid state physics

1. The Commission consists of 8 members (including the Chairman and the Secretary) and 6 corresponding members, specifically representative of ferroelectricity lattice defects, luminescence and crystal growths.

2. Except for two meetings of the Chairman and Secretary, no meeting of the Commission took place. All matters were dealt with by correspondence.

3. The following conferences sponsored by the Commission took place:

— Third Sagamore Conference on Charge, Spin and Momentum Densities, Aussois, France, 9—12 September 1970; co-sponsored by I.U.Cr.

— *Metastable Alloys, Brela, Yugoslavia, 28—30 September 1970.

— *Third International Conference on Crystal Growth, Marseille, France, 5—9 July 1971; co-sponsored by IUCr and IOCG (International Organization for Crystal Growth formerly called, Comite International de Croissance Cristalline — CICC).

— *Second International Conference on Light Scattering in Solids, Paris, France, 19—23 July 1971.

— Fourth International Symposium on Magnetic Resonance, Jerusalem, Israel, 24—31 August 1971.

— *Colour Centres in Ionic Crystals, Reading, UK, 13—17 September 1971.

— International Conference for Solid Surfaces, Boston, USA, 11—15 October 1971.

— International Conference on Thin Films, Venice, Italy, 15—19 May 1972.

— *Second International Conference on Vapour Growth and Epitaxy, Jerusalem, Israel, 22—25 May 1972; co-sponsored by IUCr and IOCG.

— *Second Symposium on Surface Physics, Enschede, The Netherlands, 22—23 June 1972.

— *International Conference on Band Structure in Solids, Exeter, UK, 3—5 July 1972.

— Seventh International Symposium on the Reactivity of Solids, Bristol, UK, 17—21 July 1972; co-sponsored by IUPAC.

4. The following conferences are to be held with IUPAP sponsorship before the fall of this year:

— *Second International Conference on Luminescence, Leningrad, USSR, 17—22 August 1972.

— *International Conference on the Applications of the Mossbauer effect, Ayeleth Hashahar, Israel, 28—31 August 1972.

— *Second International Conference on the Properties of Liquid Metals, Tokyo, Japan, 3—8 September 1972.

— First International Conference on Modulation Spectroscopy, Tucson, USA, 23—26 November 1972; recommended by the IUPAP Solid State Commission and Spectroscopy Commission.

5. General Remarks.

The number of conferences sponsored by IUPAP in the field of Solid State Physics has increased from 13 (1966—1969) to 16 (1969—1972) and there is no indication for a slowing down. The total number of participants has exceeded 5000.

Some of the conferences have repetitive character and are organized on a nearly self supporting basis (about 1/3). For the major part (2/3) financial support from IUPAP was required (indicated by an asterisk).

6. The problem of the optimum size of conferences has still produced a considerable correspondance. Although the idea of a big Solid State Conference is not systematically rejected, the Commission members favour the middle-sized conferences of 200 to 300 participants as particularly suitable in specialized Solid State topics. The idea of conferences and summer schools of the Gordon type has encountered nearly unanimous favour.

11. Commission on Particles and Fields

A. Commission Operations and Procedures: The Commission has one regular meeting per year, held in conjunction with one of the principal conferences which it sponsors. At these meetings, proposals for future conferences are discussed and decisions are made regarding recommendations for IUPAP sponsorship of these conferences. Also general questions concerning the formal and overall scheduling of conferences on different topics in particle physics and technology are discussed.

Although we prefer to make decisions after discussion at these annual meetings, problems of timing have sometimes made it necessary to reach agreement on certain proposed conferences by mail during the interval between our meetings.

Meetings of the Commission during the period 1969—1972 were held or will be held as follows:

1969 — September 16, in Liverpool, Great Britain, on the occasion of the IV International Symposium on Electron and Photon Interactions at High Energy.

1970 — August 27 and September 1, in Kiew, USSR, on the occasion of the XV International Conference on High Energy Physics.

1971 — August 25, in Ithaca, New York, on the occasion of the V International Symposium on Electron and Photon Interactions at High Energy.

1972 — September 8 (tentative date), in Chicago, Illinois, on the occasion of the XVI International Conference on High Energy Physics.

B. Conferences Sponsored by the Commission during the Period 1969—1972:

Conferences in 1969

1. Topical Conference on Weak Interactions, CERN, Geneva, Switzerland, January 1969. Category B. Financial Support: $ 1000.
Proceedings: published by CERN-Scientific Information Service, Geneva, Switzerland 1969.

2. VII International Conference on High Energy Accelerators. Yerevan, USSR, August 1969. Category B. Financial Support: $ 2000.
Proceedings: published by the Publishing House of the Academy of Sciences of Armenian SSR, Yerevan 1970; General Editor, A. I. Alikhanian.

3. Third International Conference on High Energy Collisions, Stony Brook, New York, USA, September 1969. Category B. Financial Support: $ 1000.

Proceedings: "High Energy Collisions", Yang, Cole, Good, Hwa and Lee-Franzini. Publisher — Gordon and Breach, New York 1969.

4. IV International Symposium on Electron and Photon Interactions at High Energies. Liverpool, UK, September 1969. Category B. Financial Support: None.

Proceedings: published by the Daresbury Nuclear Physics Laboratory, Daresbury, UK, 1969. Editor — D. W. Braben.

5. III International Conference on High Energy Physics and Nuclear Structure. Columbia University, New York, USA, September 1969, Category B. Financial Support: None.

Proceedings: High Energy Physics and Nuclear Structure; Proceedings. Edited by Samuel Devons, Plenum Press, New York 1970.

Conferences in 1970

1. XV International Conference on High Energy Physics, Kiev, USSR, 26 August—4 September 1970. Category A. Financial Support: US $ 4000.

Chairman of Organising Committee: N. N. Bogolubov, Joint Institute for Nuclear Research, Head Post Office, PO. Box 70, Moscow, USSR.

Proceedings: Not published.

2. International Conference on Instrumentation for High Energy Physics, Dubna, USSR, 8—12 September 1970. Category B. Financial Support: US $ 1000.

Chairman of Organising Committee: V. P. Dzhelepov, Joint Institute for Nuclear Research, Head Post Office, PO. Box 70, Moscow, USSR.

Proceedings: published by the Joint Institute for Nuclear Research, Dubna, USSR, 1971. Editor: V. P. Dzhelepov.

Conferences in 1971

1. VIII International Conference on High Energy Accelerators, CERN, Geneva, Switzerland, 20—24 September 1971. Category B. Financial Support: US $ 2000.

Organiser: K. Johnson, CERN, 1211 Geneva 23, Switzerland.
Proceedings: published by CERN-Scientific Information Service, Geneva, 1971. Editor: M. Hildred Blewett.

2. V International Conference on Electron and Photon Interactions at High Energies, Ithaca, New York, 23—27 August 1971. Category B. Financial Support: US $ 1000.

Organiser: Professor Boyce D. McDaniel, Laboratory of Nuclear Studies, Cornell University, Ithaca, New York.

Proceedings: 1971 International Symposium on Electron and Photon Interactions at High Energies. Published by the Laboratory of Nuclear Studies, Cornell University, Ithaca, New York 1972. Editor: N. B. Mistry.

3. International Conference on Duality and Symmetry in Hadron Physics, Tel-Aviv, Israel, 5—7 April 1971. Category B. Financial Support: US $ 1000.

Organiser: Professor Y. Ne'eman, Department of Physics and Astronomy, Tel-Aviv University, Ramat-Aviv, Tel-Aviv, Israel.
Proceedings: published by The Weizmann Science Press of Israel, 1971. Edited by E. Gotsman.

4. International Conference on High Energy Physics and Nuclear Structure, Dubna, USSR, 7—12 September 1971. Category B. Financial Support: US $ 1000.

Organiser: Professor V. P. Dzhelepov, Laboratory of Nuclear Problems, Joint Institute for Nuclear Research, Head Post Office, PO. Box 79, Moscow, USSR.

Conferences in 1972

1. XVI International Conference on High Energy Physics, Chicago, Illinois, 6—13 September 1972. Location: University of Chicago and National Accelerator Laboratory, Batavia, Illinois. Category A. Financial Support: US $ 3000.

Organisers: Professor Edwin L. Goldwasser, National Accelerator Laboratory, PO. Box 500, Batavia, Illinois 60510; Professor Robert

G. Sachs, The Enrico Fermi Institute, 5630 Ellis Avenue, Chicago, Illinois 60637.

2. IV International Conference on High Energy Collisions, Oxford, UK, 5—7 April 1972. Category B. Financial Support: None.
Organiser: G. Manning, Rutherford High Energy Laboratory, Oxford, Chilton, Didcot, Berkshire, UK.

3. 4th International Conference on Magnet Technology, Brookhaven, New York, 19—22 September 1972. Category B. Financial Support: None.

Organiser: Dr. J. P. Blewett, Brookhaven National Laboratory, Upton, New York 11973.

(This conference was not reviewed by the Commission on Particles and Fields.)

12. Commission on Nuclear physics

Membership

The membership remains as elected by the General Assembly, Dubrovnik, September 1969.

Chairman, Secretary, Members

R. E. Bell (Canada)
J. Teillac (France)
G. R. Bishop (UK)
S. G. Cohen (Israel)
I. M. Frank (USSR)
T. Lauritsen (USA)
R. Ramanna (India)
H. Schopper (W. Germany)

Corresponding Members

E. Baumgartner (Switzerland)
J. Fowler (USA)
R. Ricci (Italy)

M. Sakai (Japan)
I. Slaus (Yugoslavia)
S. Szalay (Hungary)

Commission Procedure

The Commission did not meet during the three-year period 1969—1972, and all business was conducted by mail. A systematic form of mail ballot was introduced for obtaining members' opinions on various questions.

No general conference on nuclear physics was held during 1969—1972 (which also explains why the Commission did not meet). The absence of a general conference ("Category A") was the result of a deliberate decision taken by the Commission early in 1970, prompted by the widespread feeling that large conferences on nuclear physics had been too frequent in the immediately preceding years (one in each of 1967, 1968, and 1969). This may be one of the few cases where a Commission has actively discouraged the holding of large conferences. A category A conference is now scheduled for Munich, August 28—September 1, 1973; see the end of this report.

On the other hand the Commission sponsored an unusually large number of category B conferences, in the three-year period. A list of them is found at the end of this report.

Overlapping Subject Matter in Conferences

In April, 1971, the Chairman of this Commission heard for the first time about a conference scheduled for September, 1971, by the Commission on Particles and Fields on the subject "High Energy Physics and Nuclear Structure". The planning of this conference was already complete and all participants were already decided upon. The program made it clear that this was a straightforward conference on nuclear physics studied by intermediate- and high-energy techniques. According to a resolution of this Commission meeting in Dubna in 1968 jointly with members of the Commission on Particles and Fields, such conferences should be handled jointly by the two Commissions.

After correspondence between the two Commissions, agreement was reached to keep in contact on such questions. The Commission on Particles and Fields has now proposed such a Conference for June, 1973, in Uppsala, Sweden, for joint sponsorship by the two Commissions. The proposed data is not the best for Nuclear Physics, but the procedure is an improvement over the preceding case, and the Chairman recommends that the new Commission ratify joint sponsorship of this conference. In future there should be full joint planning of such conferences, including the place and date.

This case has been raised here, not in order to blame anyone, but to point out the general necessity of joint planning of conferences in overlapping fields. This Commission recommended in its 1970—71 report that the Executive consider this problem and attempt to devise procedures to solve it.

Visa Problems

In 1969 at Dubrovnik, the late Chairman of this Commission, Professor Huber, reported to the General Assembly that a conference participant (and Commission member), the late Amos de-Shalit, had been excluded from the 1968 Dubna conference on what appeared to be political grounds. The present Chairman now has to report a similar case involving several participants in the Commission-sponsored conference on Nuclear Structure Study with Neutrons in Budapest, July 31 to August 5, 1972. The Executive of IUPAP has already made some investigations and has discussed the matter in an Executive meeting. It is to be hoped that the Executive will be able to recommend procedures that will enable all Commissions to avoid such problems for future meetings.

List of Conferences Sponsored

1970

Polarization Phenomena in Nuclear Reactions
Madison, Wisconsin, August 31—September 4
Category B ($1000)

Angular Correlation in Nuclear Physics
Delft, Netherlands, August 17—21
Category B ($1000)

Hyperfine Interactions Detected by Nuclear Radiation
Rehovoth, Israel, September 6–11
Category B ($1000)

1971

Statistical Properties of Nuclei
Albany, New York, USA, August 23—27
Category B ($1500)

1972

Few Particle Problems in the Nuclear Interaction
Los Angeles, California, USA, August 28—September 1
Category B ($2000)

Nuclear Moments and Nuclear Structure
Osaka, Japan, September 4—8
Category B ($1200)

Sixth International Cyclotron Conference
Vancouver, Canada, July 18—21
Category B ($1800)

Nuclear Structure Study with Neutrons
Budapest, Hungary, July 31—August 5
Category B ($1200)

Conferences Recommended by the Commission for Support

General Conference on Nuclear Physics
Munich, West Germany, August 27—September 1, 1973
Category A. Recommended grant, $5000
(Already approved in principle; amount of grant to be approved)

Photonuclear Reactions and Applications
Asilomar, California, March 26—30, 1973
Category B. Recommended grant, $1500

Reactions Between Complex Nuclei
Gatlinburg, USA. Late October, 1973
Category B. Recommended grant, $1500

V Conference on High Energy Physics and Nuclear Structure
Uppsala, Sweden. June 4—9, 1973
Category B (Jointly with Particles and Fields Commission)
Grant to be decided by agreement, not over $1000 from Nuclear Phys

Proposal received for 1974

The Few Body Problem in Nuclear (and Particle?) Physics
Quebec, Canada, August 1974

This is referred to the new Commission with the Chairman's recommendation for immediate consultation with the Commission on Particles and Fields.

R. E. Bell, Chairman
September 21, 1972

13. Commission on Atomic Masses and Fundamental Constants

1. *Change of Commission Name*

In view of the changing scope of the Commission's activities, it has become clear that the fundamental constants are an increasingly important part of the Commission's activities. Accordingly, at its meeting in September 1971 the IUPAP Executive Committee authorised the change of the Commission name to its present form.

2. *Activities*

A. The Commission was one of the sponsors of the International Conference on Precision Measurements and Fundamental Constants held at the United States National Bureau of Standards in Gaithersburg, Maryland, during the week of 3—7 August 1970. The proceeding of this Conference has been published by the United States National Bureau of Standards (Special Publication 343 (543 pp) August 1971).

B. The 4th International Conference on Atomic Masses and Fundamental Constants sponsored by the Commission was held at the British National Physical Laboratory, Teddington, England, during the weck of 6—10 September 1971. The Proceedings will be published by Plenum Press (London).

C. It has become increasingly evident that progress in precision (n, γ) and (p, γ) reaction energy determinations is hambered by a lack of uniformity and standards in the use of gamma ray calibration lines. This Commission, in conjunction with the Commission on Nuclear Physics, has therefore established a Task Group on gamma ray calibration energies. This Task Group, consisting of Dr. O. van der Leun (Netherlands), Dr. R. G. Helmer (US), and Dr. P. van Assche (Belgium), will consider the problems associated with the measurement of gamma ray energies and will attempt to establish appropriate standards in this area.

D. Professor A. H. Wapstra (Chairman of the Commission) and Dr. N. B. Gove (Oak Ridge National Laboratory) have completed the 1971 Atomic Mass Evaluation which has been published in four parts in Nuclear Data Tables, July 1971. This evaluation consisted of:

Part I. Atomic Mass Table
Part II. Nuclear-Reaction and Separation Energies
Part III. Evaluation of Input Values; Adjustment Procedures
Part IV. Systematics of Separation and Decay Energies

Part V, Nuclear Reaction Q Values will appear separately in the near future.

E. Dr. E. R. Cohen (Secretary of the Commission) and Dr. B. N. Taylor (US National Bureau of Standards) are in the process of a new evaluation of the fundamental constants. This evaluation, which will take into account the considerable amount of new material which has become available in the last three years, should be completed by September and will be published in an appropriate journal.

3. *Meeting*

The Commission has held two meetings since those reported in the previous report.

1. August 3, 1970, Washington, D. C.
2. September 5, 1971, Twickenham, England.

4. *Conferences*

Preliminary discussions have been held concerning the time and place of the 5th International Conference on Atomic Masses and Fundamental Constants. Possible locations suggested have been: Sydney, Australia; Paris; Leningrad; the Conference will be scheduled for either 1974 or 1975.

14. Commission on Physics Education

1. Meeting of the Commission

The Commission med in Rome 11—12 July 1969; in Eger, Hungary, 14—15 September 1970; and in Kiel, West Germany 25—26 June 1971. In addition to members and corresponding members of the Commission, representatives from UNESCO and other interested organisations attended. The minutes of those meetings have been circulated.

2. *International Seminar on the Role of History of Physics in Physics Education* (1970)

The Seminar was held 13–17 July 1970 at the Massachusetts Institute of Technology. The purpose of the Seminar was to stimulate and extend cooperation among physicists, historians of science, and others interested in the humanistic teaching of physics. Twenty-two persons, representing twelve countries, took part. The proceedings of the Seminar and a special report entitled *Resources for the History of Physics* have been published (University Press of New England, 1972). The Commission considered the recommendation of the Seminar that a book or books on the history of physics be written

for teachers and advanced students, but was unable to implement it within available resources.

3. *International Congress on the Education of Teachers of Physics in Secondary Schools* (1970)

The Congress was held in Eger, Hungary, 11—17 September 1970, under the joint sponsorship of IUPAP and the Hungarian National Committee on Physics Teaching. The purpose of the Congress was to review problems connected with the education of secondary-school physics teachers in many countries and to develop recommendations to government groups and universities for improved pre-service education, motivation, and continuing education of teachers. Total attendance at the Congress was 144, including representatives of 25 countries. The proceedings of the Congress have been published (MIT Press, 1971).

4. *International Congress on Teaching Physics to Students in Physics-Related Sciences and Professions*

At its meeting on 25—26 June 1971 the Commission made plans for this Congress to be held in Kiel, West Germany, 20—26 July 1972, under the sponsorship of the Commission and the West German National Committee. Between 150 and 200 participants were expected, representing the physical and biological sciences, engineering, agricultural sciences, and the health professions. The Congress was intended to provide answers to several major questions: (1) What do the "consumers" of physics education want that they are not now getting? (2) What do physicists think they have to offer that is not presently being taken advantage of? and (3) How should physics courses for non-physicist scientists and professionals be organised? Professor M. Y. Bernard of France was named the chairman of the Program Committee, and Professor W. Kroebel of West Germany the chairman of the Organising Committee. A program was developed, speakers were invited, and two circulars were distributed. The early response indicated considerable world-wide interest in the Congress.

Regrettably the Organizing Committee was unable to obtain sufficient financial support to make the Congress a success and was forced to cancel it. Notification of cancellation was sent to prospective participants early in June 1972.

5. *Other Meetings*

Plans for other international congresses or seminars are not under consideration at this time. Since the membership of the Commission will be reconstituted at the General Assembly in 1972, it does not seem advisable to carry forward planning of meetings that will be the responsibility of new members.

6. *Cooperation with UNESCO*

Two writing projects — "A Source Book for the Teaching of Physics in Secondary Schools" and "New Trends in the Teaching of Physics" — were completed. Manuscript were given to UNESCO by the editors and publication is imminent.

7. *Request to IUPAP*

The reconstituted Commission will undoubtedly want to meet early in the triennium 1972—1975 to plan new activities. The requirement for travel funds will depend upon the number of Commission members and their distribution. It is suggested that at least $2000 be budgeted by IUPAP for Commission travel in 1972—73.

Conferences Sponsored 1969—1972

International Seminar on the Role of History of Physics in Physics Education, Cambridge, Massachusetts, USA, 13–17 July 1970.

History in the Teaching of Physics, University Press of New England, Hanover, New Hampshire, 1972.

Resources for the History of Physics, University Press of New England, Hanover, New Hampshire, 1972.

Planck's Original Papers in Quantum Theory, Taylor and Francis, Ltd, London, 1972.

International Congress on the Education of Teachers of Physics in Secondary Schools, Eger, Hungary, 11—17 September 1970.
Teaching Physics — An Insoluble Task? MIT Press, 1971.

15. Commission on Atomic and Molecular Physics and Spectroscopy

Only a few commission members were able to attend the Commission meeting held in Oxford, England on 23 July 1970 at the occasion of the Oxford conference on Atomic Physics. Most of the affairs concerning the commission were dealt with by correspondance. The International Conferences sponsored by IUPAP in the field of Commission XV were the followings in chronological order:

1970:

a) The Second International Conference on Atomic Physics held in Oxford, United Kingdom, 21—24 July 1970, organized by Dr. WOODGATE. 200 participants from 17 countries took part in this conference where all aspects of atomic physics were discussed.
The abstracts of the papers were available at the conference.

b) The International Conference on Precision Measurements and Fundamental Constants was held in Gaittersburg, Maryland, USA on 3—7 August 1970, organized by Dr. L. M. BRANSCOMB. This was the first conference devoted to the field of fundamental constants as a whole. It achieved broad representation of most of the current work and except for the regrettable absence of contributions from the USSR, achieved good international participation. 193 participants attended the conference, 154 from USA and 39 from other countries.

c) An International Conference on "Applications of Holography" was held in Besançon, France, on 6—11 July 1970. It was organized by Professor J. VIENOT and financially supported by the International Commission of Optics. It had a very large attendance, more than 400 participants from 24 countries. The summary of the communications has been published by "Nou-

velle Revue d'Optique Appliquée" Edition Masson, Paris, in its March—April 1970 issue.

d) IUPAP had given also its moral support, without financial contribution, to the 16th Congress AMPERE held in Bucarest, Rumania, 1—5 September 1970, organized by Professor I. URSU. The proceedings of this conference on "Magnetic resonance and related phenomena" have been published by the Academy of Romania.

1971:

a) The seventh International Conference on Physics of Electronic and Atomic Collisions was held in Amsterdam, 26—30 July 1971, organized by Professor J. KISTEMAKER. The conference brought together 800 scientists from 26 nations. The invited talks and progress reports were on subjects of broad interest to scientists in the field of atomic and molecular physics. The proceedings have been published by North Holland Co.

b) The Third International Conference on Vacuum Ultraviolet Radiation Physics was held i Tokyo, Japan on 30 August—2 September 1971, organized by Dr. ISHIGURO and Prof. FUJIOKA. The Conference covered essentially the entire range of vacuum ultraviolet from 2000 Å to a few Å.
204 participants attended the conference, among them 54 from abroad. More than 80 papers were presented. The booklet of abstracts was available at the conference.

1972:

a) The International Conference on Inner Shell Ionization Phenomena was held at Atlanta, Georgia, USA 17—21 April 1972, organized by Dr. R. W. FINK, Professor of Chemistry. It was the first International meeting in this field of physics. Its interest was to bring together workers in the fields of Auger electron spectroscopy, X-ray spectroscopy, radioactive decay, atomic collisions, theoretical atomic physics and nuclear physics.

b) The Third International Conference on Atomic Physics, held in Boulder, Colorado, USA, 7—12 August 1972, organized by Dr. S. T. SMITH from JILA.

c) The 17th Congress AMPERE on Magnetic Resonance and Relaxation Phenomena held at Wihuri Laboratory, University of Turku, Finland 21—26 August 1972, organized by Professor V. HOVI. 300 participants from 30 countries attended the meeting, where could be noticed a strong participation from both USSR (21 participants) and USA (21 participants). 14 invited papers and 102 communications were presented. The Congress report will be published by North Holland Co.

16. Commission on Plasma Physics

This Commission was formed by the XIII General Assembly of IUPAP in September 1969. Unfortunately, because of the large number of verbal nominations given to the General Assembly for membership on this Commission, it was not until late March that the officers of the Commission had a validated list of members and corresponding members. This seven-month delay in determining who the members of the Commission were prevented the Commission from doing any work before June 1970.

Most of the Commission business has been carried out by mail, but the Commission had one formal meeting in connnection with the Fourth Conference on Plasma Physics and Controlled Nuclear Fusion Research, which was held in Madison, Wisconsin, USA, on 22 June 1971. Present or represented were the followinng members and corresponding members: Professor H. Alfven, represented by Dr. B. Lehnert, Sweden; Professor Sanborn C. Brown, Secretary, USA; Dr. K. Husimi, Japan; Professor Ioan-Iovitz Popescu, Romania; Dr. Richard F. Post, USA; Dr. C. M. Braams, The Netherlands; Dr. Bruno Brunelli, Italy; Dr. J. L. Delcroix, represented by Dr. C. J. Jablon, France; and Professor E. S. Weibel, Switzerland.

The area of plasma physics and ionized gases is a very comprehensive one, and as a result there are several other international organizations which have committees of various sorts in this area of

physics. One of the very useful functions performed by the IUPAP Commission is to serve as a liaison between these various other organizations. This is accomplished to a large extent by overlapping membership. For example, the International Atomic Energy Agency has set up an International Fusion Research Council. Dr. C. M. Braams, a corresponding member of the Commission on Plasma Physics of IUPAP, is Chairman of the IAEA Council. The European Physical Society has set up a Plasma Physics Division and Dr. B. Lehnert, who has been acting for Professor Alfven on the IUPAP Commission, is the President of this Division. There is a self-perpetuating International Scientific Committee that runs the International Conferences on Phenomena in Ionized Gases. It has been the recommendation of this Commission that a member of this Committee be nominated to membership on the Plasma Physics Commission to provide close liaison with this International Scientific Committee.

Also in connection with the wide range of physical phenomena covered by the field of plasma physics, this Commission has recommended to the General Assembly that the Plasma Physics Commission be made up of not less than two members expert in plasma physics, two members expert in gas discharge physics, and two members expert in astrophysical plasma phenomena.

Conferences sponsored by the Commission during 1971 were the following:

a) International Symposium on Plasma Physics in St. John's Newfoundland, 5—9 July 1971; Conference Organizer: Dr. M. P. Bachynski, RCA Laboratories, 1001 Lenoir, Montreal, P. Q., Canada.

b) Seminars in Fundamental and Applied Laser Physics, Isfahan, Iran, 1—7 September 1971; Conference Organizer: Professor Ali Javan, Rm. 6-210, Massachuseets Institute of Technology, Cambridge, Massachusetts 02139, USA.

c) Xth International Conference on Phenomena in Ionized Gases, Oxford, England, 13—18 September 1971; Conference Organizer: Dr. R. N. Franklin, Keble College, Oxford England.

No conferences were sponsored by the Commission during the year 1972. This can be explained principally by the fact that there are two major international conferences of interest to this Commission which meet on a regular basis: one, the Conference on Phenomena in Ionized Gases, and the other, the Controlled Thermonuclear Fusion Conference. The first meets every two years and the second meets every three years and both met in 1971.

Conferences scheduled for 1973 are the following:

a) XIth International Conference on Ionization Phenomena in Gases, Prague, Czechoslovakia, September 1973; Conference Organizer: Dr. L. Pekarek, Czechoslovak Academy of Science, Vinicna Ul. 7, Praha 2, Czechoslovakia.

b) Conference on Plasma Theory, Kiev, USSR, October 1973: Conference Organizer: Professor L. A. Artsimovich, I. V. Kurchatov Institute of Atomic Eenergy, Moscow, USSR.

17. International Commission for Optics

1. *Bureau*

Le bureau actuel a été élu lors de CIO 8 (Reading 1969). Il est constitué par: Prof. H. H. Hopkins (President), J. Ch. Viénot (Secr. Trés.), Prof. B. Havelka, Prof. Koreo Kinosita, Dr. R. M. Scott, Dr. W. H. Steel (Vice-Présidents).

2. *Status — règlementation*

Le Bureau de la CIO a mis au point un projet de rénovation des Status de la CIO, celui-ci a été propsé au Secrétaire Général de IUPAP el devrait être normalement discuté lors de la réunion CIO 9 en octobre 1972 à Santa Monica.

La nécessité de règlementer l'organisation des Écoles d'Été a également amené à proposer une procédure qui leur est applicable. Enfin, le Bureau de la CIO a examiné les relations à mettre en place d'une part avec les différentes organisations s'occupant des Couches

Minces, d'autre part avec les groupes d'optique européens et la Société Européene de Physique.

3. *Réunions*

Plusieurs conférences et symposia ont été organisés sous les auspices de la CIO.

— Symposium International sur les Applications de l'Holographie, Besançon (France): 6—11 Juillet 1970.

— Symposium sur les Performances visuelles dans l'observation à travers un instrument d'optique, Munich (Allemagne): 21—23 Juillet 1971.

— 3ème Conférence Int. sur la Physique du Rayonnement Ultra-Violet dans le Vide, Tokyo-Kyoto (Japon): 30 Aoû—2 Septembre 1971.

— Optique intégrée, Ondes Guidées, Matériaux et Systèmes, Las Vegas, Nevada (USA): 7—9 Février 1972.

— Réunion Internationale sur les Couches Minces, Venise (Italie): 15—19 Mai 1972.

4. *Communications — bulletin de liaison*

La CIO ne comportant pas de membres individuels, mais regroupant les Comités Nationaux d'Optique de différents pays, les liaisons se font lors des Assemblées Générales (tri-annuelles), lors des Congrès et Symposiums de la CIO. L'amorce d'un bulletin de liaison régulier a démarré (a) sous forme de circulaires: octobre 1969, puis janvier 1970; (b) ensuite, un bulletin de liaison («News-Letter») a été diffusé: février 1971 puis avril 1972. Ce bulletin a pour but de renseigner les différents pays members sur les activités de l'année (cf. copies jointes).

5. *Glossaire multilingue*

La mise au point d'un glossaire multilingue d'optique se poursuit. Une documentation étendue a été réunie, tant du point de vue lexicologique que du point de vue correspondance des termes dans des disciplines voisines.

6. *Accroissement du nombre des pays membres de la CIO*

Plusieurs adhésions nouvelles doivent être prochainement ratifiées ou sont actuellement en cours. Il s'agit d'Israël, du Mexique et de la République Démocratique d'Allemagne. Il semble que la Commission pourra également bientôt compter l'U. R. S. S. parmi ses membres.

7. *Budget*

Le budget de la CIO reste à peu pres stationaire, les cotisations n'ayant pas été réajustées et les ressources extérieures étant inexistantes.

APPENDIX III

INTER-UNION ACTIVITIES

ICSU Scientific Committee on Oceanic Research (SCOR)

The increasing scientific and public interest in the oceans has been reflected in increased activity of the numerous international scientific organisations concerned and, in particular, by SCOR. The work of SCOR is carried out at meetings of its executive committee, at general meetings which are usually combined with oceanographic conferences, at meeting of working groups and by publications. A part of the work is biological, geological or chemical and of no direct interest to IUPAP; a substantial part, however, is concerned with the physical properties of sea water and sediments and with hydrodynamics, thermodynamics and instrumentation. All of this has a basis in physics.

During the period four volumes of *SCOR Proceedings* have been published, these give a detailed account of the meetings and of the work done and resolutions adopted. One general meeting was held. This took place in Tokyo and was a joint enterprise with IAPSO, IABO, and CMG. The proceedings have been published as a book, *The Ocean World* edited by M. Uda (Tokyo 1971). A number of smaller conferences have been held.

Much attention was given at the Tokyo meeting to considering the formation of a *Marine Sciences Union*. It was the almost unanimous view of those present that this was unnecessary and would be very difficult to achieve in view of the multiplicity of organisations whose agreement would be needed. Most people felt that it would be more satisfactory to strengthen SCOR. With this in view a revised constitution for SCOR was drafted; this is being considered by ICSU. A feature of this constitution is the introduction of a new class of

Invited Members. This is to enable SCOR to coopt eminent oceanographers even if they are nationals of countries that have not joined SCOR. Some such members have already been appointed.
The main technical work of SCOR is done througt working groups which hold meetings and organise cooperative projects. The working groups of main interest to IUPAP are:

WG 10 Oceanographic tables and standards. This committee prepared tables giving the physical properties of sea water and is responsible for advising on the certification of standard sea water. Particular attention has been given to the equation of state and to the relation between electrical conductivity and salinity. The theory of motions in the ocean requires very accurate determinations of denisty as a function of temperature, pressure and salinity. The investigations promoted by the working group have produced a great improvement in the quality of the data available. The program is continuing.

WG 15 Photosynthetic radient energy. This group is concerned with the methods of measurement of solar radiation in the sea that are relevant to biology.

WG 21 Continuous current velocity measurement. This group is engaged in a comparison at sea of the performance of the principal types of current meters. Its work has revealed a number of discrepancies which are being investigated.

WG 27 Tides of the open sea. This group is concerned with instrumentation for measuring tides in the deep sea and with the analysis of the results.

WG 28 Air-sea interaction. This group is concerned with the transfer of energy, momentum and water between ocean and atmosphere. It is involved in the oceanographic aspects of the Atlantic Tropical Experiment of GARP and in the Mid-Ocean Dynamics Experiment.

WG 34 Oceanographic basis of ocean monitoring and prediction systems. This group is concerned with the design of equipment for systematic monitoring of oceanic conditions, the planning of cooperative programs and the dynamical interpretation of the results.

Most of these group are joint enterprises with other international bodies. Their terms of reference will be found in volume 7 of the *SCOR Proceedings* and accounts of the work of each are usually to be found in each issue.

Concern has been expressed lest the development of international law to cover activities in the deep sea might seriously restrict many kinds of oceanographic research. Much time has been spent on the discussion of this matter. Whilst the discussions have not led to any real consensus on the best method of minimising interference, they have led to a wider appreciation of the difficulties and have probably had some effect on the positions adopted by governments.

The eleventh general meeting of SCOR will take place in Oban, Scotland, in September 1972.

Upper Mantle Project

The Upper Mantle Project officially ended in December 1970. A final symposium on the results of this international corporation was held in August 1971 in Moscow at the general assembly of the International Union of Geodesy and Geophysics; the proceedings have been published as a special issue of Tectonophysics. During the period of the Upper Mantle Project it is not an exaggeration to say that a revolution has taken place in the earth sciences, especially with the discovery of many quantitative determinations of the large horizontal displacements of the earth's crust which have occurred over the last 100 m. y. The verification of the once speculative theory of continental drift and its more recent complement, the theory of sea floor spreading and the formulation of the theory of plate tectonics, has given us a dynamic in place of a static model of the earth's interior. The study of the physics of the processes in the earth's interior which has caused these movements, creep, convection and heat transfer, is still in a rudimentary state and most interesting problems in solid state physics and hydrodynamics invite investigation.

ICSU Abstracting Board

Report by H. W. Koch

The Abstracting Board of ICSU has made considerable progress of direct interest to IUPAP during the 1969—1972 period. A so-called Input Plan has been developed and approved by the Board in 1970. According to this plan, the major abstracting and indexing services of the world, including Physics Abstracts and Chemical Abstracts Service, will share the responsibilities and substantial costs involved in inputting a World Abstracting and Indexing System. An important prerequisite to the operational feasibility of this plan is the standardisation of the classification and indexing schemes for the organisation of physics literature in this computerised system. The ICSU/AB Working Group in Physics has just completed the details and agreements for a Physics Classification Scheme that will soon be adopted by Physics Abstracts, Bulletin Signalatique, and Physikalische Berichte, as well as many of the primary journals of the American Institute of Physics and the European Physical Society. Such agreements are not only the results of ICSU/AB efforts, but also of the effective coordination supplied by such commission of ICSU as the Publications Commission of IUPAP. Both the Board and this Commission can be justly proud of their past contributions to the developments of science information systems of the near future.

The importance of continued IUPAP contributions should be emphasied. IUPAP is the principal mechanism for ensuring that appropriate consideration be given to the needs, capabilities, and interests of individual physicists, who, after all, are to be the main contributors to, and users of, the information systems in physics now being designed and developed. Because of the importance of IUPAP's role, I am delighted that a physicist active in the publications committee of the European Physical Society will be encouraged to participate in ICSU/AB after my term of involvement as IUPAP representative is completed. My own personal involvement with ICSU/AB will continue as a representative of the American Institute of Physics that became a member service of the Board in 1972.

The Executive Committee and the General Assembly may want to consider expanding formally the role of the Publications Commission so as to include in its terms of reference abstracting and indexing, together with primary publications. This expansion would be facilitated by making the IUPAP representative to ICSU/AB a member of the Publications Commission and by charging the Commission with the responsibility for nominating the IUPAP representative to the Board. Consideration may also want to be given to changing the name of the Publications Commission to the Science Information Commission.

APPENDIX IV

RESOLUTIONS ADOPTED BY THE 14th GENERAL ASSEMBLY OF ICSU

The 14th General Assembly of ICSU

I. FREE CIRKULATION of SCIENTISTS

recapitulates that the terms of reference of the Standing Committee on the Free Circulation of Scientists, as defined by the 10th General Assembly, are to assist the Executive Board to find solutions to various problems associated with the implementation of the resolution, according to which the declaration of "political non-discrimination", adopted by the 8th General Assembly, is reaffirmed, and moreover:

: in holding ICSU meetings and meetings of ICSU scientific and special committees, the Council shall take all measures within its powers to ensure the fundamental right of participation, without any political discrimination, of the representatives of every member of ICSU concerned and of invited observers,

: this policy be adopted also by tho Unions adhering to ICSU for all their activities,

: the ICSU National Members be invited to follow this policy;

noting with satisfaction that ICSU, in executing its declared policy of supporting free international collaboration among scientists, has been successful in most cases;

observes, however, with regret, that scientists are still today sometimes not allowed freely to attend the appropriate scientific meetings organized by the ICSU family either abroad or in their home countries;

notes that the obstacles encountered in recent years have fallen into the following categories:

1. The refusal of a visa to enter a certain country. Fatal delays in granting visas.

2. Refusal of permission to participate in an appropriate scientific meeting organized by the ICSU family in the country of the scientist in question.

3. Refusal of the permission to travel to scientific meetings organized by the ICSU family and held outside the country.

Excessive payment required for the permission to travel out of the country to such meetings.

fearing that the difficulties encountered by scientists from some countries, in gaining permission freely to travel to scientific meetings of the ICSU family in other countries or to participate in such appropriate meetings in their own country, might endanger the global character of ICSU and the Unions;

decides to remind the affiliated Unions and other organs of ICSU of their obligation to bring all instances, in which the free circulation of scientists has been restricted, to the notice of the ICSU Standing Committee on the Free Circulation of Scientists;

recommends that when consideration is being given to the selection of a place for an ICSU meeting, the Standing Committee in the Free Circulation of Scientists shall, on request, provide summary information in its possession on previous cases of restriction relatives to the proposed place of meeting;

II. MIGRATION of TALENT

observes that recently considerable communication has been received by the Standing Committee on the difficulties encountered by some scientists wishing to migrate from their country;

observes also that this form of "brain drain", that is, the migration of talent from developing countries to the industrialized ones is of

great concern to the developing as well as to developed countries, as illustrated among others by resolution 1.243 of the General Conference of Unesco at its 16th session, in 1970;

observing, moreover, that the prevention of migration of scientists from a country is an internal political question, outside the terms of reference of ICSU, but nevertheless a serious challenge to the world scientific community;

notes that this problem does not fall withing the mandate of the Standing Committee on the Free Circulation of Scientists;

decides to ask the Executive Board to study how ICSU should approach this new problem, namely the factual impossibility of migrating from a country and to report to the 15th General Assembly.

APPENDIX V

September 23, 1972

MEMORANDUM

TO: Secretary-General

FROM: R. E. Bell

SUBJECT: Visa Problems

(This memo is written because I will be absent from the IUPAP General Assembly meeting of September 24 where visa problems will be discussed. The views here expressed are my own and have not been submitted to either the Canadian Delegation or the Nuclear Physics Commission. In what follows, "country" means "IUPAP member country.")

1. I believe that the free movement of scientists for international scientific purposes is the most important aim of IUPAP. We should continue to press for this aim even while realizing that success may never be complete.

2. It is not reasonable to expect a host country to declare in advance that any scientist will be admitted to any IUPAP-sponsored meeting. Countries will presumably always retain the right to exclude individuals on an individual basis, and IUPAP should explicitly recognize this right.

3. It does seem reasonable to ask a host country to declare in advance that individuals will not be excluded solely on grounds of national origin. To secure such an advance declaration even in a single instance would be an important forward step for IUPAP. It is most likely to be achieved when the host country is a medium-sized one, possessing a considerable degree of flexibility in foreign policy. I believe IUPAP should press for such declarations at every opportunity. An equivalent form of declaration, which might be easier to

secure, would state that the host country is willing to consider individual visa applications from the citizens of any country to attend IUPAP — sponsored meetings.

4. The test of the sincerity of such a police (declared or undeclared) would be the host country's willingness to allow substitutes from the same country for any scientists whose individual applications had not been allowed.

5. What if (as in fact is common) no such declaration is received from official sources in the host country? IUPAP has already adopted this policy for itself; it should behave as if the declaration had been made, and proceed with the planning of the conference on the basis of its own policy. If, as seems very unlikely, an advance declaration were made by the host country that it would *not* consider applications from citizens of all countries, then IUPAP sponsorship should be withdrawn. Recovery of any IUPAP funds already advanced to the conference should not be attempted.

6. What if there is no declaration, but at the last moment scientists are excluded on grounds of national origin? This is the commonest kind of case; often the facts are not established until after the conference is finished. What sanctions should be attempted, if any, against the host country? In general, I believe that any possible sanctions should be applied against the country and not against the scientists of that country. The only sanctions that occur to me are, assuming that the facts are well established,

a) publicizing the occurrence in IUPAP publications and elsewhere, and

b) extreme caution in sanction further IUPAP events in the offending country.

7. I believe that IUPAP actions about visa problems should be carried out primarily by the President, Secretary-General, and Executive, rather than by individual commissions. The reason is clear: to bring the full weight of the IUPAP to bear on each case.

I hope that the General Assembly will adopt a clear policy similar to that expressed above, and that the "Checklist" for conference sponsorship will make that policy very explicit.

APPENDIX VI

Presidential address by Professor Robert F. Bacher at the XIVth General Assembly, Washington, September 1972

During the past few days we have heard some fine papers presented before the Scientific Sessions of this 50th Anniversary General Assembly of our Union. There have been reviews by distinguished physicists of most of the main areas of physics and some of the areas in which physics impinges on other sciences. These talks have shown us the present status of these many fields and some idea of the most important areas of future growth. The accomplishments of the past fifty years are very impressive. An enormous, coherent body of knowledge has been put together with many interlocks in fundamental concepts as well as in quantitative observation and calculation.

It would be easy looking at these accomplishments of physics to be too satisfied. But in fact, some of the most basic areas of physics are understood very imperfectly. One might say that our understanding is exceeded only by our ignorance. Looking back at one large field over a period a bit longer than the fifty years of our Union, the introduction of the nuclear atom led to the Bohr theory and, almost fifty years ago, to the development of quantum mechanics. Meanwhile properties of nuclei, especially the radioactive ones, were being studied and isotopic species were being elucidated. The whole subject of nuclear physics blossomed out in the early thirties with the discovery of the positive electron and the neutron and the advent of nuclear accelerators. By 1940 after the discovery of fission, a sizable amount of knowledge about nuclei had been assembled and was increased by intensive efforts on the large scale release of nuclear energy during World War II. This itself was a happening that had been singled out many years before by Rutherford himself as being so much moonshine. But physicists have more than once underestimated nature both in predicting what will come to pass and how complex the real world is. I can recall a distinguished

theoretical physicist saying in the mid forties that if we just understood the nucleon-nucleon interaction up to 10 million electron volts a bit better, we would have the key to nuclear forces. It soon became clear that pions and probably other unstable particles created in much higher energy interactions were involved in nuclear forces. This provided the impetus for studying nucleon interactions at high energy and for the development of high energy accelarators. The last twenty years have been spent unraveling the various excited states and unstable particles which are created at much higher energy and which are intimately connected with an understanding of the subject. The richness of nature has always been underestimated and nuclear and particle physics are no exceptions.

In many areas, but especially in the understanding of the very small and the very large, physics has been in the forefront of our understanding of nature. Some people — apparently an increasing number at present – are content to accept the behavior of nature as they see it with their own eyes. But many others, including all scientists, have a yearning to know more about why nature is the way it is or how various observed phenomena are related. This yearning prods uts to dig always deeper into the atom, the atomic nucleus, excited states of nucleons and unstable particles. This urge also drives physicists and astronomers to learn more about what exists in those vast reaches of space in which we play so small a part and which contain such a wide variety of unusual objects. Many of these objects were unknown or at least unrecognized relatively few years ago. Scientific work in these and other areas has greatly affected our realization of the scope and complexity of nature, while giving us some confidence that, in the extraordinary way in which some of these observations fit together, we have a significant understanding of some parts of nature. In turn this work has added greatly to our culture and affected some of the most basic ideas of our philosophy.

As our understanding has increased, the difficulty, complexity and cost of adding to this understanding has increased very greatly. Financial support in increasing amounts especially from public funds has been essential to the development of fundamental physics in almost every area. This, of course, has brought a greatly increased

scrutiny by those who authorize the expenditures, as well as those who look at them with the thought that they could be used "more practically" or more helpfully for society, in other ways.

The real increases in support for basic science came about, however, mainly for the reason that the applications of science were vital to our technology. Technology became of major importance to industry, to the military, to transportation, to communication, to health care, to agriculture and to a host of other developments that affect our everyday lives. Then came space exploration with its enormous costs and its dependence on very highly sophisticated instrumentation. Space missions gave a fine opportunity for exiting new scientific observations and indeed some people reached the conclusion that this was the reason for space programs. Actually most of the missions could hardly have been justified even in small part entirely on their scientific contributions. These space missions were explorations on a new and very grand scale — not scientific experiments. The technical developments in this area often used some of the most recently discovered scientific findings and this technology forged an even stronger connecting link between science and technology. Along with all of these links came greater support for fundamental science because it formed the base for technology and because some scientifc work led directly to new technology as a part of its own development. Inevitable the great development of technology has had an enormous impact on our society. Not all of this has been beneficial. Much of it has led to an increase in the complexity of life. For example the great developments in communication and transportation which have increased both the amount of exchange and the speed of exchange of ideas and news throughout the world, have in some ways degraded our environment. It may happen that a technological development which saves endless toil may have some effects which must be curbed in order not to become a nuisance or even a danger to society. As a result there are some people today who damn technology thoroughly and science too because of its close connection.

Things have not always been this way. I recall a story about Hilbert who, commenting to a group of students on the then often discussed hostility between science and technology remarked that this could

not possibly be true because they have nothing at all to do with one another. Indeed the separation of science and technology has played some part in the development of our Union. From the first it was named a Union of Pure and Applied Physics but historically there has been much greater emphasis on pure physics than on applied physics. This was probably both correct and inevitable many years ago but it certainly does not represent the situation today. Pure physics and applied physics are so tied together that no attempt to consider them completely separately can be successful. In looking to the future we must be increasingly aware of this close connection whether the application of physics is to another branch of science or whether it is to technology. In the former application there will be an immediate enrichment of pure physics itself and in the development of technology there may be major effects on our society as well as increases in our capabilities in pure physics.

The involvement of technology in the problems of our society and in particular the blame attached by some people to technology as the origin of many of our difficulties, poses some major problems for the future. This blame has probably been enhanced by some well meaning scientists and engineers who contrariwise believe that most of the problems of present day society can be solved by technology itself. This has sometimes been referred to as the "technological fix". It is rather unlikely that very many of the present day problems of society can be fixed by technology alone. It will usually require the solution of many other economic, social and political problems in addition. To most physicists this appears to be a journey into unknown and often disliked territory. Indeed it is true that most scientists are untutored in these areas and should realize that their views are those of laymen not experts. But this does not change the basic fact that science-based technology may be necessary but surely not sufficient for the solution of many of society's pressing problems. Those who say "Let us turn the clock back and live with the simplicity which our forefathers enjoyed" underestimate the magnitude of our present day problems and the impossibility of society doing without many of the advances that are rooted in technology. We have no chance of supporting the world population today without

employing our technology and the difficulties in the near future will be much worse. Even many of those parts of presently utilized technology which are not absolutely essential for existence would be given up with the greatest reluctance if at all.

Recently a sociologist at Harvard, Irene Taviss, has questioned wheter the negative attitude of people toward technology, which we hear about constantly, is a reality. She has conducted a pilot study and contends that "the anti-technology spirit that so many commentators assure us is rampant in the land is probably a myth". Of course, this is only a preliminary study in a small part of the United States and it may not be confirmed elsewhere. Whether the anti-technology and anti-science spirit is a myth or not, it is getting a lot of attention from people who like to attribute many of society's problems to the development and widespread use of technology.

Various writers including Sir Peter Medawar and Murray Gell-Mann have pointed out that anti-science and anti-technology comments are only part of the picture. These sentiments carry still further into anti-rationality and sometimes to a growth in pseudoscience and mysticism. The astronomers have bemoaned the fact that there are many more astrologers than astronomers. The increased attention given to astrology, palm reading and various forms of magic and superstition is an evidence that the anti-rationality of those who criticize the effects of technology on our society, while probably a minority wiew, is a potent one and this view is shared by a significant number of educated and presumably intelligent people, especially young people. It is true that inadequate attention has often been paid to the full impact of new technical developments on society. Too little consideration has often been given to the serious effects on our environment. Too little value has been placed on preservation of the quality of our environment.

Scientists have often pointed out that they cannot be responsible for unforseeable uses of the technology that come from scientific discoveries. Such cases are not imaginary. The early use of radio telescopes as an interferometer did not anticipate the extraordinary success of the phase-lock system which was used. This system was further developed in the long distance telemetry of the space pro-

gram. Now it is possible to use a base line roughly the earth's diameter. This leads to very high resolution of radio sources and with a point source, to distance determination on earth to 10 or 20 centimeters. Not only does this lead to new and exciting results in radio astronomy but may permit the measurement of fault motion and continent drift as never before. This same development also has major possibilities for extremely accurate navigation and may have important military applications. None of this could have seemed credible at the beginning.

Another example is the laser. The discoveries of the maser and the laser came out of an investigation to see if stimulated emission could really be observed as predicted by Einstein. The first laser was operated only a little more than ten years ago. Now we have lasers used in eye surgery, in accurate surveying and for many other purposes. Powerful lasers emitting short bursts of radiation are being applied to thermonuclear reactions. Most recently we hear that they are being used to produce laser driven implosions with the aim of producing thermonuclear energy releases in small pellets. Where this will lead is not easy to predict today, but the utilization of thermonuclear energy in the future seems to be almost certain. The energy demands due to increasing population and increasing energy use per person, even if restrained, will not be able to be met indefinitely from other sources.

The problem is and will continue to be: How can the beneficial effects of science based technology be maximized and the bad effects be minimized? This depends principally on how the technology is utilized and what care is taken by society in its exploitations. The problem will not be solved by trying to turn the clock back for science and technology. We need our science and technology desparately to solve the inevitable problems of the future.

It seems to me that physicists are beginning to think much more about the nature of the technology-society interaction and will try to understand it better. In the introduction to a report of an extended study of this subject at Harvard, Emmanuel Mesthene has summarized some of the studies that were conducted to ascertain the "degree to which technological change determines social change".

He concludes that the technologies which are developed and applied depend on institutions and values prevalent in society at any given time but that technological innovation provides society with new capabilities and not all of its consequences can be foreseen. He refers to social changes as a second order effect of technological change and one might extend this to make it a third order effect of scientific change or discovery. These higher order effects are still significant. It is interesting that he rejects the idea that the technological developments determine the nature of society.

Others in the social sciences take a much more negative attitude toward all technology and are critical of Mesthene. They lose sight of the dependence that we have today on technological developments for the continued existence of our present day society. Rather, they take the wholly negative view that the impact of technology on society has such disagreeable results that technology and science too should be curbed and not developed further. While this is certainly a minority view, scientists would be wise to pay more attention to the applications of science in the future.

If we look at our Union this means that we should take applied science seriously. In the relations with other fields of science, we will gain by broadening and enriching pure physics. In recent years some of the exciting interdisciplinary new fields have grown up in Special Committees outside the Unions. Some of these Special Committees involve the subject matter of many Unions and have built up a body of knowledge of their own too. In our Union we have not always carried out our obligations in keeping in close communication with the work of these Committees. This has led to some cases in which research under some of our own Commissions is no longer fully representative of the subjects with which they are concerned. Some physicists find that the only way in which they can communicate with other physicists who work in new fields is to do so outside the Union. I am not proposing that fields of research covered by Special Committees should be allocated to one Union or another. Special Committees have often been able to get support for their work more easily just because they were set up around a particular project. Partly for this reason the trend for many years has been for much

of the interdisciplinary work to go on without very close ties to related work in the Unions. The result is that small areas of science become isolated from the more general fields of which they are a part. Some of this separation may be inevitable with the large number of new interdisciplinary fields that have sprung up. It would be helpful to our Union and to the Special Committees if we put a greater effort into the communication and liaison with related Special Committees. The use or application of physics to other sciences is increasingly important to science as a whole.

The applications to technology and in particular the effects that these may have on our society are much more difficult problems, and these are today imperfectly understood. We physicists need to understand these effects and their reaction back on science more clearly. We can't be responsible for all the unforeseen consequences of science and technology but we surely must be more sensitive and understanding of possible consequences. There will inevitably be vigorous arguments as to whether the net effect of a particular development is beneficial or injurious and criteria for judgement will vary. It is not an easy task. But it is one in which physicists have both an obligation to society and a considerable amount of self-interest as well. The first problem is to improve understanding. Physicists do have something to contribute in working with these problems because of their technical content. There are also many examples of the application of scientific methods achieving success outside the fields of science. But to understand some of these problems takes knowledge in other areas as well. Perhaps the first step is to recognize this and to try to correct it.

Some of the Unions representing the sciences are by nature connected to applications which affect society. In physics this is not often the case, although a large fraction of the work in solid state and semiconductors has a close relation to industrial use and much of the work in these areas is supported by industry. Very likely there will be closer ties to industrial use in the future. It is accordingly somewhat anomalous that the relations of our Uunion with international engineering organizations continue to be as tenuous as they are. We do not need to incorporate technology and engineering into IUPAP but we do need to keep closer ties with the organizations which

represent these areas. Once again, this is increasingly made necessary by the involvement of physics and applied physics in technology and engineering advances, and the reaction that society has to this connection. We must know more about the applications of science and be able to understand better than we do today both the positive and the negative reactions of society to technological developments. Perhaps in time physicists will be able to exert more influence on how science is applied to technology, and to help maximize some of the beneficial effects and minimize some of the harmful consequences. During these past fifty years and especially in the past twenty years we have seen a great increase in the international exchange of ideas in physics. Our Union has had a major part in this growth especially through its sponsorship of international conferences by the various Commissions. Ease and speed of travel have greatly increased the number of international contacts that the average physicist has. These contacts and the opportunity to exchange ideas in person inevitably lead to better international understanding and this is an important result of our Union's principal activity — sponsoring international conferences.

We have now reached the point where our Union may be able to take additional steps. With the building of large new facilities for research, it has become increasingly common for research groups to travel long distances to carry on an experiment. It has been found to be much more effective for a group going to another country to collaborate in the work with physicists from the host country or the host laboratory. This international collaboration usually results in extended periods of residence and close association of the collaborating scientists. I have spoken to many physicists who have participated in such collaborative efforts and each one has been enthusiastic, particularly about the increase in international understanding that results. I hope that in the future our Union can play as important a role in the fostering of international collaboration in research as it has in the promotion of international conferences. There is still far too much red tape involved in collaborative efforts and perhaps this is an area where we can help.

We think of our Union as being truly international and there have

been many efforts to make it so. There are, however, some major gaps in our membership and, in addition, we are poorly represented among the developing countries. We need to purse every opportunity to fill the major gaps in our membership and to make efforts to have an active participation by the physicists from important and influential nations whose role in IUPAP has been small or completely absent.

For the developing nations it is not surprising that their interest in IUPAP has not been very great. Our main activities have been in sponsoring research conferences on the latest work on the forefront of the various fields of pure physics. This is not of primary interest to the developing nations and there is no reason why it should be. The developing nations *are* interested, however, in many aspects of technology as it applies to agriculture, health care, transportation, communication and certain areas of industry just to mention a few. To follow these needs effectively, education is essential, particularly in the fundamentals that underlie these developments. In most cases some understanding of the fundamentals of physics is essential. Our ties to developing nations should be centerad much more around the education that is needed in the course of their development. This is probably not the same physics education that has evolved in the more fully developed nations. We should, however, be able to utilize our experience in physics education and, with a study of the needs of the developing nations, be able to produce some very tangible assistance. This will be an easy task and it may go slowly but it seems to me to be a real challenge for our Union and especially for our Commission on Physics Education.

Looking back over our history we see some remarkable achievements in promoting international communication and exchange in physics. This has clearly resulted in an increase in understanding among the world's physicists. As we look to the future, there are many more opportunities ahead for our Union and I have tried to indicate a few of these to you today. I am confident that our Union will be able to continue its good work of the past and to extend it in the future. We can all hope and expect that our contributions to international understanding among physicists will be a growing part of that more universal understanding that is essential for world peace.

IV — SOME RESOLUTIONS PASSED BY GENERAL ASSEMBLIES

International Conferences

"For the patronage of the Union to be granted to a Conference, which implies, in principle, a subsidy from the Union fixed according to needs and available funds, it is necessary:

1. that the Executive Committee should have approved this subsidy, taking into account the future interest of the subject and other subjects proposed for Conferences;

2. that the organizers of the Conference should have, beforehand, undertaken to submit to the President of the Union the precise date, scientific programme, place of meeting, and choice of people to be invited to present the principal papers. The choise of the speakers should be made in such a way as to ensure the greatest possible *international* participation at the Conference."

(London, 1954)

Visas

"The International Union of Pure and Applied Physics, considering that free travel possibilities of all scientists for the participation in international scientific conferences form an indispensable basis for successful international co-operation, and considering further that this question not only touches the International Union of Pure and Applied Physics, but all scientific Unions, requests the International Council of Scientific Unions:

1. to encourage its national members to take appropriate steps with their respective governments for arranging facilities for granting exit and entry visas to all scientists attending international scientific conferences;

2. to bring the problem to the notice of the United Nations with the request that a way be found for the free movement of scientists attending scientific conferences and meetings."

(Warsaw, 1963)

Young Scientists

"In view of the desirability of providing continuity in the growth of close international contacts between physicists, the General Assembly of IUPAP considers it highly desirable to include some younger scientists among delegations to large international conferences sponsored by IUPAP in addition to leading scientists in the particular field."

(Warsaw, 1963)

ICSU

"The General Assembly of the International Union of Pure and Applied Physics approves in principle the proposals of the reorganizing committee of ICSU, but makes the following recommendation: In order to safeguard the scientific character implied in ICSU's name, it is highly desirable to prevent the voting power of the unions being outbalanced by the voting power of the national members in the General Assembly of ICSU. Balance could be achieved by increasing the vote of the unions and by giving each general union more votes than each specialized union. It is realized that, as the number of unions and nations adhering to ICSU increases, the voting procedure will need modification."

(Warsaw, 1963)

Scientific Papers

"Every scientific paper, with the possible exception of short letters,

should be published with a synopsis (or abstract) in English, French or Russian. It is desirable to print it also in a second language."

(Warsaw, 1963)

Publications

"The General Assembly approves:

1. The Guide for the Preparation of Author's Abstracts for publication with authorization to make some modifications in order to achieve accord with UNESCO;

2. The Guide for the Preparation of Scientific Papers for Publication with authorization to make some modification in order to achieve accord with UNESCO;

3. The statement on Biblographic References on the second page of the Commission report;

4. The following statement on publication of conference proceedings: The assembly of collections of preprints for the participants does not constitute satisfactory publication of the proceedings of a conference. It is highly desirable that conference proceedings should be refereed in the same way as journal articles. When the proceedings are published as a unit, rather than by separate submission of the papers to appropriate journals, publication should be in a regular or special issue of a journal or in a book which will be made widely available through established channels.

A paper may be included in the proceedings of a conference, even though it may have been published first as a journal article. In this case, the bibliographic reference should be given. The published proceedings should be covered by the abstracting services, and conference secretaries should assume responsibility for bringing them to the attention of the abstract journals.

The General Assembly recommends:

5. The adoption of a single standard for Journal Title Abbrevia-

tions and, to that effect, draws the attention of ISO to the work of Committee Z-29 of the American Standards Association."

(Basle, 1966)

Physics Education

"Considering that:

1. advances in the rapidly growing fields of pure and applied Physics not only deepen mankind's understanding of the universe, but through their applications have profound implications for human welfare and destiny;

2. discoveries in Physics, the most basic of the natural sciences, strongly affect all of the basic and applied sciences and the professions related to them;

3. the teaching of Physics to advanced students of physics, to students in related scientific and professional fields, and to those who will become part of an enlightened citizenry can only be done well by those who are themselves active in creating or in using new knowledge; and

4. research reaches its culmination in the communications of new knowledge to others, and employers should recognize the importance of evaluation and synthesis of existing knowledge which often require depth of insight and creativity at least as great as primary research:

the International Union of Pure and Applied Physics resolves that:

1. Research and education be carried on in the closest possible association;

2. Any tendencies toward divergence between the activities of advancing and of disseminating knowledge be vigorously counteracted and efforts to improve the teaching of Physics be encouraged;

3. Excellence in teaching and in the dissemination of knowledge about Physics should receive the same recognition as excellence in research. In this connexion, all sponsoring agencies and foundations

should give financial support for the preparation of critical reviews of current developments and for the compilation of critical data;

4. Talented research workers be expected to teach, and their exemption from teaching occur only in special circumstances and not as a reward for excellence;

5. Teachers be encouraged to maintain their intellectual vitality and participation in the advancement of knowledge by being given time for research or for closely related scholarly activities;

and

6. Research workers in Research Institutes and Industrial Laboratories should collaborate with Academic Institutions in the training and education of advanced students in Physics."

(Dubrovnik, 1969)

Symbols

" The General Assembly recommends:
that authors be encouraged to adapt the SI units for data in Physics journals as recommended by the SUN Commission, the Conférence générale des poids et mesures and the International Organization for Standardization and by other international unions closely related to Physics. Editors are urged to use persuasion rather than stronger measures to secure the cooperation of authors in the choice of symbols for physical quantities and of units, but should require that standard symbols for units be used except when the name of the units are written out in full."

(Dubrovnik, 1969)

People's Republic of China

"Considering the importance for the work of IUPAP of having as national member the People's Republic of China, the XIVth General Assembly of IUPAP invites and authorizes, within the framework of

the IUPAP statutes, its Executive Committee to take all measures which the Committee deems necessary to achieve this goal."

(Washington, 1972)

CODATA

"The General Assembly mindful of the importance of reliable and readily accessible physical data urges specialized commissions and other bodies associated with IUPAP to pay attention to the compilation and evaluation of data and to include, whenever appropriate, such activities in their agenda and programmes. It also requests the IUPAP representative on CODATA to study other possible modes of action with a view to increasing data activities within the Union."

(Washington, 1972)

V — INTERNATIONAL CONFERENCES

Each year, IUPAP sponsors from 20 to 25 international conferences and awards grants to some of them. Conference organizers desiring IUPAP's sponsorship should communicate with the appropriate international commission which will then make recommendations to the IUPAP Executive Committee. April of the year proceeding proposed conference is the target date by which requests should be made to commissions. The request should include the IUPAP checklist which may be obtained from commissions (it is reproduced at the end of this section) and other information as indicated in the following pages.

1. Categories

A. *General Conferences*

These would be designed to provide an overview of the entire field of interest to a Commission, and would normally occur at three-year intervals if advances in the field warrent. Attendance in the range of 750—1500 would be anticipated.

B. *Topical Conferences*

These would concentrate on broad sub-fields in the area of the particular Commission's interest (e.g. nuclear spectroscopy, nuclear reaction mechanisms, heavy ion physics in the case of the Nuclear Physics Commission). They would normally be scheduled in the years between the type A General Conferences, if the latter have been held. Attendance in the range of 300—600 would be anticipated.

C. *Special Conferences*

These would concentrate on much more restricted specialized topics than in the case of type B Conferences (e.g. angular correlations,

lifetime measurements, neutron resonance studies in the case of the Nuclear Physics Commission). These would be scheduled in the years between the type A General Conferences, if the latter are held. Attendance in the range of 50—200 would be anticipated.

2. Criteria

A. *Scientific Value*

a) There should be a clearly demonstrated need for the proposed conference, i.e. new and important advances to be discussed since the last conference of a similar type took place;

b) the invited speakers and the papers accepted for discussion should be of high caliber;

c) the accepting of papers should be based on some sort of refereeing system which assures a level comparable with that of papers in the regular journals. If the proceedings of the Conference are published, every effort should be made to have them published as a special issue of a regular journal in order to make them widely and easily available to the scientific community.

B. *International Character*

a) There should be an international committee advising on the scientific programme;

b) the participation should be genuinely international, and not constitute effectively a national conference to which a few physicists from outside the country are invited. Such national conferences are necessary and valuable, but do not come within the mandate of IUPAP. Organizers of conferences seeking Union sponsorship should make every effort to ensure that the attendance from outside the host country be not less than 30 % and preferable be more than 50 %;

c) open conferences should admit physicists of any IUPAP member country. For a "closed" conference, the invitation list should

include potential contributors from all IUPAP member countries which have active programmes in the field;

d) IUPAP will not sponsor a conference if visas are refused for travel to it purely on grounds of nationality or citizenship. It is understood that request for sponsorship implies that the host country makes timely entrance possible for every scientist recommended for participation by the international committee (a).

C. *Organization*

a) The Conference should have the approval of the relevant international Commission of IUPAP, and thus pertinent details should be submitted by the month of April of the year prior to that in which the conference is to be held;

b) it is important that the precise dates, address of the Conference and name and address of the Conference Secretary or Chief Organizer be submitted to the Commission, which can sometimes then help to avoid conflicts of dates, etc.;

c) the proposed Conference would benefit by having the approval of the National Committe for IUPAP of the most country;

d) it is very helpful to the International Commission to have as much detail as possible about the organization and budget for the proposed Conference.

3. Other

The Union Executive meets in late September of each year, at which meeting sponsorship of conferences is decided and grants, if any, are made. Commissions should forward their recommendations to the Associate Secretary-General by July 1st, including all of the information mentioned above (2-C: Organization). The Commission's recommendations should be based on the criteria of 2-A and 2-B, and should include a classification as to category (1). Therefore, organizers of Conferences should apply to Commissions by April, in order to allow the Commission to meet (often by letter) and study the request. Re-

quests for sponsorship of conferences not falling within the domain of a Commission should be sent directly to the Associate Secretary-General.

4. Résumé of IUPAP Policy concerning the Free Circulation of Scientists

1. The free movement of scientists for international scientific purposes is one of the most important aims of IUPAP. The Union will continue to press in this aim even while realizing that success may never be complete.

2. In this respect, IUPAP adheres to the declarations of ICSU and has made this policy the object of repeated resolutions.

3. While one might not always expect a host country to declare in advance that *any* scientist will be admitted to any IUPAP sponsored meeting, it does seem reasonable to ask as a minimum commitment that the host country declares in advance that individuals will not be excluded solely on grounds of national origin.

The check-list which IUPAP requires from Commissions before sponsoring an international conference requests this minimum commitment.

4. The test of the sincerity of such a commitment (declared or undeclared) would be the host country's willingness to allow substitutes from the same country for any scientist whose individual application had not been allowed for reasons concerning themselves rather than their nationality.

5. If no commitment is received from official sources in the host country, IUPAP will often behave as if the declaration had been made and proceed with the planning of the conference on the basic of its own policy. In this it will be guided by recent experience in the host country concerned.

If, following this, scientists are in fact excluded from the host country on grounds of national origin, this fact is publicized in IUPAP documents, reported to the ICSU committee on the free circulation

of scientists, and extreme caution is used in considering further IUPAP events in this particular country.

6. If rather than refusing individual scientists a host country, subsequent to a conference being granted IUPAP sponsorship, issue a declaration that it will not grant visas to citizens of a particular country, then IUPAP sponsorship would normally be withdrawn.

IUPAP recognizes that scientists do not in general approve of restrictive visa problems and therefore seeks to obtain redress by correction of the situation and not by any penalizing effective or implied of the scientists in the offending country.

5. Checklist

INTERNATIONAL UNION of PURE and APPLIED PHYSICS

CHECK LIST (see IUPAP Document 17)

INTERNATIONAL CONFERENCES

Name of Commission: .....

1. Title of Conference: .....

Location: ..... Date: .....

Organizer or Secretary: name: .....

address: .....

.....

.....

Category of Conference:

A — General Conference: .....

B — Topical Conference: .....

C — Special Conference: .....

2. *Scientific Value:*

: Is there a clearly demonstrated need? .....

: Date of last conference on subject: .....

: Will refereeing system assure papers of high caliber? .....

: Are there sufficient distinguished guest speakers? .....

: Approximate number: .....

: Examples: .....

.....

3. *International Character:*

: Is there an international committee advising on the scientific programme? .....

Name of two members: .....

.....

: Will participation be sufficiently international (not less than 30 %, preferably more than 50 %)? .....

: Will the conference be open (must admit physicists of any IUPAP member country)? .....

: Will the conference be by invitation (should include potential contributors from all IUPAP member countries having active programmes in field)? .....

: Does host country guarantee visas will not be refused on grounds of nationality or citizenship? .....

(Very important: see IUPAP Document 17)

4. *Organization:*

: Has this conference the approval of the Commission? .....

: Has this conference the support of the National Committee of the host country? .....

: Are there any conflicts of dates with other conferences on similar subjects? .....

: Is financial support requested? ..... Amount: $.....

: Probable total budget: $.... Is there a registration fee? $....

Date: ..... per: .....

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(to hold office until the 1975 General Assembly)

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Prof. B. M. VUL, Lebedev Physical Inst., Leninsky prospect 53, **Moscow,** USSR.

Prof. V. F. WEISSKOPF, Dept. of Physics, Massachusetts Inst. of Tech., **Cambridge, Mass. 02139,** USA.

Prof. H. WERGELAND, Institutt for Teoretisk Fysikk, Universitetet i Trondheim, **7934 Trondheim,** NORWAY.

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Associate Secretary-General:

Prof. J. S. NILSSON, Institute of Theoretical Physics, Fack, **S-402 20 Göteborg 5,** SWEDEN.

Sir W. BRAGG	1922—1931	H. J. BHABHA	1960—1963
R. MILLIKAN	1931—1934	L. NÉEL	1963—1966
M. SIEGBAHN	1934—1947	D. I. BLOK-	
H. A. KRAMERS	1947—1951	HINTSEV	1966—1969
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E. AMALDI	1957—1960		

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LIST OF NATIONAL COMMITTEES (39)

Units: Number of subscription units of US $300

Votes: Number of votes at the General Assembly

Units	Votes	Name of Country	Address
2	2	Argentina	Dr. Alberto F. BONFIGLIOLI, Secrétaire général, Asociacion Fisica Argentina, Avenida Santa Fé 1145, **Buenos Aires,** ARGENTINA.
6	3	Australia	Dr. J. S. DRYDEN, National Standards Laboratory, Australian Academy of cience, University Grounds, **Chippendale, N. S. W. 2008,** AUSTRALIA.
1	1	Austria	Dr. O. J. EDER, Executive Secretary — c/o Österreichische Studiengesellschaft f. Atomenergie, Lenaugasse 10, **A-1080 Wien,** AUSTRIA.
4	3	Belgium	M. Nève de MÉVERGNIES, Laboratoire du Centre d'Études de l'Énergie nucléaire, **2400 Mol-Donk,** BELGIQUE.
1	1	Bolivia	Lic. Carlos AGUIRRE B., Director — Lab. de Fisica Cosmica, Instituto de Investigaciones Fisicas, Universidad Mayor de San Andrés, **La Paz,** BOLIVIA.
2	2	Brazil	Dr. A. M. COUCEIRO, Conselho Nacional de Pesquisas, Avenida Marechal Camara 350, **Rio de Janeiro G. B.,** BRAZIL

1	1	Bulgaria	Dr. Emil NADJAKOV, The Academy of Sciences of Bulgaria, 1, Street of 7 November, **Sofia 13,** BULGARIA.
8	4	Canada	Dr I. M. TEMPLETON, Division de Physique pure, Groupe de Physique des Métaux, Conseil national de Recherches, **Ottawa K1A OR6,** CANADA.
1	1	Cuba	Sr. Giraldo Acevedo FANEGO, Director de Relaciones Internacionales, Academia de Ciencias de Cuba, Capitolio Nacional, **La Havana,** CUBA.
3	2	Czechoslovakia	Dr. J. FISCHER, Institute of Physics, CSAV, Na Slovance 2, **180 40 Prague 8,** CZECHOSLOVAKIA.
3	2	Denmark	Prof. S. ROZENTAL, Niels Bohr Institutet, 15, Blegdamsvej, **Copenhagen DK-2100,** DENMARK.
1	1	Arab Republic of Egypt	Dr. S. R. HADDARA, Academy of Scientific Research and Technology, 101 Kasr El-Eini Street, **Cairo,** (ARAB REPUBLIC OF EGYPT).
1	1	Finland	Mr. L. LAITINEN, Vakaustoimisto, Mariank 14, **Helsinki,** FINLAND.
12	5	France	M. J. BADOZ, Laboratoire d'Optique physique, École supérieure de Physique et de Chimie industrielles, 10, rue Vauquelin, **Paris 75,** FRANCE.
4	3	German Democratic Republic (DDR)	Dr. A. BUCHNER, Physikalische Gesellschaft, Am Kupfergraben 7, **Berlin W. 108,** DDR.

12	5	Federal Republic of Germany (BRD)	Dr. W. HEINICKE, Gotenstrasse 1—3, **D-53 Bonn-Bad Godesberg 1,** FEDERAL REPUBLIC OF GERMANY.
15	5	Great Britain	Dr. D. C. MARTIN, C. B. E., The Royal Society, 6, Carlton House Terrace, **London S. W. 1,** ENGLAND.
4	3	Holland	IUPAP National Committee, Dutch Physical Society, c/o Mrs. N. Adan, secr., Van der Waals-Laboratorium, Valckenierstraat 67, **Amsterdam,** HOLLAND.
2	2	Hungary	Prof. G. TURCHANYI, Orvosi Fizikai Intezet, Puskin u. 9, **Budapest VIII,** HUNGARY.
4	3	India	Dr. M. G. K. MENON, Director The Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, **Bombay 5,** INDIA.
1	1	Ireland	Dr. G. McGREEVY, Royal Irish Academy, 19, Dawson Street, **Dublin 2,** IRELAND.
2	2	Israel	Prof. A. SHAPIRA, Faculty of Physics, The Weizmann Institute of Science, **Rehovot,** ISRAEL.
12	5	Italy	Prof. B. BRUNELLI, Comissione Italiana di Fisica, Consiglio Nazionale delle Ricerche, Piazzale delle Scienze 7, **Rome 00100,** ITALIA.
8	4	Japan	Prof. Isao IMAI, Department of Physics Faculty of Sience, The University of Tokyo, Bunkyo-ku, **Tokyo 113,** JAPAN.

1	1	Republic of Korea	Dr. Tae-Soon YIM, Public Relation Secretary, Korean Physical Society, c/o Department of Physics, Seoul National University, **Seoul,** SOUTH KOREA.
2	2	Mexico	Prof. M. S. VALLARTA, Comision Nacional de Energia Nuclear, Insurgentes 1079.3, **Mexico 18 D. F.,** MEXICO.
1	1	New Zealand	Dr. I. J. HODGKINSON, Physics Department, University of Otago, P. O. Box 56, **Dunedin,** NEW ZEALAND.
3	2	Norway	Prof. Kjell HERLOFSEN, Manager, Det Norske Videnskaps-Akademi, Drammensveien 78, **Oslo 2,** NORWAY.
1	1	Pakistan	Dr. M. R. SIDDIQI, President — Pakistan Academy of Siences, 77-E Satellite Town, **Rawalpindi,** WEST PAKISTAN.
4	3	Poland	Prof. Mr. Josef WERLE, Institute of Physics, Hoza 69, **Warszawa,** POLAND.
3	2	Romania	Prof. A. CORCIOVEI, Institute for Atomic Physics, P. O. Box 35, **Bucharest,** ROMANIA.
1	1	South Africa	Dr. G. GAFNER, S. A. National Committee for IUPAP, N Phys R L, P. O. Box 395, **Pretoria,** SOUTH AFRICA.
4	3	Spain	Prof. Luis BRU, Facultad de Ciencias, Ciudad Universitaria, **Madrid 3,** ESPANA.

8	4	Sweden	Dr. Ingvar OTTERLUND, Institute for Physics, Lunds Universitet, Sölvegatan 14, **S-223 62 Lund,** SWEDEN.
2	2	Switzerland	Prof. H. H. STAUB, Physik-Institut der Universität, Schönberggasse 9, **Zürich 8001,** SWITZERLAND.
1	1	Taiwan	Dr. Y. K. TAI, President — The Physical Society, P. O. Box 2330, **Taipei,** TAIWAN.
18	5	United States of America	Mr. R. Y. DOW, Division of Physical Sciences, National Academy of Sciences, 2101 Constitution Avenue N. W., **Washington, D C.** 20418, USA.
12	5	USSR	Dr. B. A. LESHKOVSTEV, Academy of Sciences of the USSR, Leninskii prospekt 14, **Moscow B-71,** USSR.
1	1	Yugoslavia	Prof. J. MOSER, Faculty of Science, University of Skopje, P. P. 105, **910 00 Skopje,** YUGOSLAVIE.

SPECIALIZED COMMISSIONS

During the course of its history, the Union has established a number of expert committees or commissions. The purpose of these committees varies considerably. For example, one of the important ones, called Symbols, Units and Nomenclature (SUN), meets regularly and prepares recommendations on various symbols and units, as its title suggests, which are submitted for approval by the General Assembly. Several of the special committees confine their work to the organization of international conferences, for example, in magnetism, cosmic rays and various other topics.

The General Assembly of the Union appoints the members of the commissions including the chairmen and secretaries. Commissions are expected to make nominations which must be sent to the Secretary-General a few months before each General Assembly.

The 1931 General Assembly decided that the President and the Secretary-General should be *ex officio* members of all Union commissions.

The normal period of service for a member of a commission is six years. Exceptions to this rule can be made, particularly for secretaries of commissions.

The 1960 General Assembly decided that commissions should be limited to six or seven members. In addition, some corresponding or associate members can be appointed. They are to be regarded as advisers to commissions. They will receive all the appropriate commission papers and may attend meetings in the place of an absent member.

It is essential that secretaries of commissions should send copies of all the commission papers to the Secretary-General of the Union.

A Commission usually meets during an international conference held under the auspice of the commission. Some commissions, for example the SUN Commission and the Publications Commission, may need to hold special meetings from time to time.

Commissions are granted a travel allowance from Union funds for these meetings. However, it is usually necessary for members of commissions to seek additional travel grants in their respective countries in order that an adequate number of meetings may be held.

At present, there are 16 specialized commissions. The membership of these commissions is given below. The date after each name is the year of the person's appointment to his class of membership. A summary of the activities of each Commission was deposited with the Secretary-General at the Dubrovnik General Assembly. Highlights are to be found in Appendix II of the Minutes of this meeting. Inquiries concerning the work of commissions should be addressed to the appropriate chairmen or secretaries.

1 — FINANCIAL COMMISSION

Prof. H. MAIER-LEIBNITZ, Deutsche Forschungsgemeinschaft, Kennedyallee 40, **5300 Bonn-Bad Godesberg 1,** BRD.

Prof. L. PAL, Central Research Institute, Hungarian Academy of Sciences, Postfach 49, **Budapest 114,** HUNGARY.

2 — COMMISSION for SYMBOLS, UNITS, NOMENCLATURE (S.U.N.) (1931)

Chairman:

Prof. E. RUDBERG (1954), The Royal Swedish Academy of Sciences, **S-10405 Stockholm 50,** SWEDEN.

Secretary:

Prof. Dr. U. STILLE (1954), Physikalisch-Technische Bundesanstalt, Bundesallee 100, **D-33 Braunschweig,** BRD.

Members:

A. BRAY (1972), Istituto di Metrologia, "G. Colonnetti", Strada delle Cacce 73, **Torino,** ITALIA.

J. de BOER (1948), Instituut voor Theoretische Fysica, Universiteit van Amsterdam, Valckenierstraat 65, **Amsterdam-O,** NETHERLANDS.

R. G. CHAMBERS (1972), H. H. Wills Physics Laboratories, University of Bristol, Royal Fort — Tundall Avenue, **Bristol BS8 1TL,** ENGLAND.

E. DJAKOV (1969), Institute of Electronics, Bulgarian Academy of Sciences, Blvd. "Lenin" no 152, **Sofia,** BULGARIA.

D. ILKOVIC (1969), Katedra Fyziky, Elektrotechnickej, Fakulty SVST, **Bratislava** — Frana Krala 25, CZECHOSLOVAKIA.

I. I. NUVIKOV (1966), Chkalova 41/2, **Moscow,** USSR.

L. ROSENFELD (1963), † Nordita, Blegdamsvej 17, **D1-2100 Copenhagen,** DENMARK.

J. ROSSEL (1959), Institut de Physique, Université de Neuchâtel, Appart. Chantemerle 3, **Neuchâtel Ch-2000,** SUISSE.

L. VILLENA (1969), Serrano 121, **Madrid 6,** SPAIN.

H. C. WOLFE (1957), American Institute of Physics, 335 East, 45th Street, **New York,** N.Y. 10017, USA.

Associates:
IUPAC:

M. L. McGLASHAN, Chemistry Department, Exeter University, **Exeter,** Devonshire, UNITED KINGDOM.

BIPM:

J. TERRIEN, Bureau international des Poids & Mesures, Pavillon de Breteuil, **Sèvres F-92,** FRANCE.

3 — COMMISSION on THERMODYNAMICS and STATISTICAL MECHANICS (1945)

Chairman:

Prof. D. D. BETTS (1969), Theoretical Physics Institute, The University of Alberta, **Edmonton,** CANADA.

Secretary:

Prof. P. MAZUR (1966), Instituut-Lorentz voor Theoretische Natuurkunde, Nieuwsteeg 18, **Leiden,** NETHERLANDS.

Members:

A. A. ABRIKOSOV (1969), L. D. Landau Inst. for Physical Problems, Vorobevsky Shosse, 2, **Moscow, B-334,** USSR.

G. BOATO (1972), Instituto di Fisica dell'Università, Viale Benedetto XV, 5, **Genova,** ITALIA.

H. R. CALLEN (1972), Department of Physics, University of Pennsylvania, **Philadelphia,** Penn. USA.

H. HAKEN (1972), Tech. Universität Stuttgart, Azenbergstrasse 12, **D-7 Stuttgart,** BRD.

C. HEMMER (1972), Institute of Physics, Norges Tekniske Hogskole, **Trondheim,** NORWAY.

B. JANCOVICI (1972), Lab. de Physique théorique, Bâtiment 211, Université de Paris, **91 Orsay,** FRANCE.

C. G. KUPER (1972), Technion-Israel Inst. of Tech., Department of Physics, Kuryat Hatechion, Nave Sheanan, **Haifa,** ISRAEL.

P. T. LANDSBERG (1972), Dept. of Applied Maths. and Math. Physics, University College, P.O. Box 78, **Cardiff CF1 1XL,** WALES.

H. MORI (1972), Department of Physics, Faculty of Science, Kyushu University, Hakozaki-cho, **Fukunka,** JAPAN.

P. SZEPFALUSY (1972), Inst. for Theoretical Physics, Roland Eotvos University, Puskin utco 5-7, **Budapest VIII,** HUNGARY.

4 — COMMISSION on COSMIC RAYS (1947)

Chairman:

Prof. M. G. K. MENON, Tata Inst. of Fundamental Research, Homi Bhabha Road, Colaba, **Bombay 5,** INDIA.

Secretary:

Prof. A. J. SOMOGYI, Department of Cosmic Rays, Central Research Inst. of Physics, POB 49, **Budapest 114,** HUNGARY.

Members:

E. BAGGE, Inst. for Pure and Applied Nuclear Physics, University of Kiel, Olshausenstrasse 40—60, Bldg. 32, **D-23 Kiel,** BRD.

C. CASTAGNOLI, Laboratorio di Cosmo-geofisica del C.N.R., Corso Fiume 4, **Torino 10133,** ITALY.

Senorita R. GALL, National University, **Mexico City,** MEXICO.

J. GIERULA, Institute of Nuclear Physics, Laboratory of Cosmic Rays, ul. Radzikowskiego 152, **Krakow 23,** POLAND.

J. NISHIMURA, Inst. of Space and Aeronautical Science, University of Tokyo, Komaka, Meguro-ku, **Tokyo,** JAPAN.

B. PETERS, Dansk Rumforskningsinstitut, D.T.H., Lundtoftevej 7, **2800 Lyngby,** DENMARK.

S. N. VERNOV, Academy of Sciences, B. Gruzinskaya 10, **Moscow G-242,** USSR.

C. J. WADDINGTON, School of Physics and Astronomy, University of Minnesota, **Minneapolis,** Minn. 55455 USA.

5 — COMMISSION on VERY LOW TEMPERATURE PHYSICS (1949)

Chairman:

Prof. O. V. LOUNASMAA (1969), Dept. of Technical Physics, Helsinki Univ. of Technology, **SF-02150 Otaniemi,** FINLAND.

Secretary:

Prof. T. SUGAWARA (1966), Institute for Solid State Physics, University of Tokyo, 7-22-1 Roppongi — Minato-ku **Tokyo 116,** JAPAN.

Members:

E. L. ANDRONIKASHVILI (1972), The Inst of Physics of the GSSR, Guramishvili Street 6, **Tbilisi 77,** USSR.

N. B. BRANDT (1972), Department of Solid State Physics, Physical Faculty, Moscow State University, **Moscow 117234,** USSR.

A. H. COOKE (1972), Clarendon Laboratory, **Oxford,** ENGLAND.

B. DREYFUS (1969), Centre de Recherches sur les très basses températures, CNRS, Boîte postale 166, **Grenoble 38042,** FRANCE.

W. J. HUISKAMP (1972), Kamerlingh Onnes Laboratorium, University of Leiden, Nieuwsteeg 18, **Leiden,** NETHERLANDS.

W. KLOSE (1972), Dept. of Theoretical Solid State Physics, Universität, **D-66 Saarbrücken,** BRD.

A. K. SREEDHAR (1969), Solid State Physics Laboratory, Lucknow Road, **Delhi,** INDIA.

I. M. TEMPLETON (1972), Metal Physics Group, Physics Division, National Research Council, **Ottawa, K1A OR6,** CANADA.

M. TINKHAM (1972), Physics Department, Harvard University, **Cambridge,** Mass 02138 USA.

6 — COMMISSION on PUBLICATIONS (1949)

Chairman:

Dr. S. PASTERNAK (1966), Editor — The Physical Review, Brookhaven National Laboratory, **Upton,** L.I., N.Y. 11973, USA.

Secretary:

Prof. J. FRIEDEL (1969), Division de Physique des Solides, Université de Paris-Sud, Centre d'Orsay, **Orsay 91,** FRANCE.

Members:

E. BRETNÜTZ (1969), "Physikalische Berichte", Bundesalle 100, **D-33 Braunschweig,** BRD.

B. R. COLES (1969), Physics Department, Imperial College, Prince Consort Road, **London SW7,** ENGLAND.

J. HAMILTON (1972), Nordita, Blegdemsvej 17, **Copenhagen DK-2100,** DENMARK.

R. HEARING (1972), Department of Physics, Simon Fraser University, **Vancouver,** CANADA.

K. KINOSITA (1966), Department of Physics, Gakushuin University, 1-5 Mejiro — Toshima-ku, **Tokyo,** JAPAN.

J. KVASNICA (1972), Faculty of Maths. and Physics, Charles University, Ke Karlovu 3, Praha, CZECHOSLOVAKIA.

E. M. LIFSHITS (1969), Vorobyovskoe shosse 2, **Moscow B-334,** USSR.

A. W. K. METZNER (1972), Publications Division, American Institute of Physics, 335 East 45th Street, **New York,** N.Y. 10017, USA.

N. R. NILSSON (1972), Physics Department, University of Uppsala, Box 530, **S-571 21 Uppsala 1,** SWEDEN.

P. PAPALI (1969), "Il Nuovo Cimento", c/o Società Italiana di Fisica, via L. degli Andalò 2, **Bologna 40124,** ITALIA.

Associate:

From ICSU-AB: J. ZIMAN, Physics Department, Bristol University, **Bristol,** UNITED KINGDOM.

7 — COMMISSION ON ACOUSTICS (1951)

Chairman:

Prof. J. MATTEI (1969), Département Acoustique-Vibrations, Direction des Études et Recherches, 24, rue Jeanne d'Arc, **Saint-Mandé 94,** FRANCE.

Secretary:

Prof. D. SETTE (1966), Istituto di Fisica della Facolta Ingegneria, Università di Roma, Piazzale delle Scienze 5, **Roma 00100,** ITALIA.

Members:

B. L. CLARKSON (1972), Institute of Sound and Vibration Res., The University, **Southampton SO9 5NH,** ENGLAND.

H. G. DIESTEL (1972), Acoustics Department, Physikalisch-Technische Bundesanstalt, Bundesallee 100, **D-33 Braunschweig,** BRD.

G. L. FUCHS (1969), University of Cordoba, Ciudad Universitaria, Est. 32, **Cordoba,**, ARGENTINA.

I. HIRSCH (1969), School of Arts and Sciences, Washington University, **St. Louis,** Miss.,USA.

J. IGARASHI (1972), Inst. of Space and Aeronautical Science, University of Tokyo, 4—16 Sakudarai — Nerima, **Tokyo,** JAPAN.

F. KOLMER (1966), Res. Inst. of Sound and Picture, Provaznicka 8, **Praha 1,** CZECHOSLOVAKIA.

A. LARA (1969), Centro de Investigaciones Fisicas, Serrano 144, **Madrid 6,** ESPANA.

A. RIMSKII-KORSAKOV (1969), Acoustical Institute, ul. Shwernika 4, **Moscow,** USSR.

E. A. G. SHAW (1972), Physics Division, National Research Council, **Ottawa K1A OR6,** CANADA.

F. TARNOCZY (1969), Acoustics Research Group, Hungarian Academy of Sciences, Puskin u. 5—7, **Budapest VIII,** HUNGARY.

Associates:

From IUTAM: M. G. LIGHTHILL, Imperial College, Prince Consort Road, **London SW7,** ENGLAND.
IUPAB: Pending.
IUBS: Vacant.

IUPS: S. IURATO, Cattedra di Istologia ed Embriologia generale dell'Università di Bari, Istituto di Anatomia Umana Policlinico, **Bari,** ITALY.

8 — COMMISSION ON SEMICONDUCTORS (1957)

Chairman:

Prof. V. M. TUCHKEVICH (1972), Institute of Technical Physics, Politechnicheskaya 26, **Leningrad,** USSR.

Secretary:

Prof. J. BOK (1966), Groupe de Physique des Solides, École normale supérieure, 24 rue Lhomond, **Paris 75,** FRANCE.

Members:

J. AUTH (1969), Sektion Physik, Humboldt-Universität zu Berlin, Brennerstrasse 92, **DDR-110 Berlin,** DDR.

F. BASSANI (1972), Department of Physics, University of Rome, Piazzale delle Scienze 5, **Rome,** ITALIA.

R. GRIGOROVICI (1969), Institutal de Fizica, Academie Republicii Socialiste Rumania, Calea Victoriei 114, **Buchuresti,** ROMANIA.

C. HILSUM (1972), Physics and Electronics Department, Royal Radar Establishment, **Malvern,** Worcestershire, ENGLAND.

E. O. KANE (1969), Bell Telephone Laboratories, P. O. Box 261, Room 1D-242, **Murray Hill,** N. J. 07974, USA.

H. KAWAMURA (1969), Department of Physics, Osaka University, Toyonaka, **Osaka,** JAPAN.

O. MADELUNG (1972), Institute for Theoretical Physics (II), University Marburg, Mainzer Gasse 33, **D-3550 Marburg/Lahn,** BRD.

A. MANY (1972), Section V, Racah Institute of Physics, The Hebrew University, **Jerusalem,** ISRAEL.

9 — COMMISSION ON MAGNETISM (1957)

Chairman:

Dr. G. T. RADO (1966), Naval Research Laboratory, Magnetism Branch, **Washington,** D. C. 20390, USA.

Secretary:

Dr. H. B. Møller (1972), Physics Department, Danish Atomic Energy Laboratory, RISO, **Roskilde,** DK-4000 DENMARK.

Members:

W. ANDRÄ (1969), Inst. on Magnetic Materials, Central Inst. of Solid State Physics, German Academy of Siences, Helmholtzweg 4, **DDR-69 Jena,** DDR.

A. BLANDIN (1969), Laboratorie de Physique des Solides, Université Paris-Sud, Bâtiment 510, **Orsay 91,** FRANCE.

C. J. GORTER (1969), Kamerlingh Onnes Laboratorium, Nieuwsteeg 18, **Leiden,** NETHERLANDS.

J. KANAMORI (1972), Department of Physics, Faculty of Sciences, Osaka University, Toyonaka, **Osaka 560,** JAPAN.

W. LOW (1972), Microwave Division, The Racah Inst. of Physics, Danciger "B" Bldg., The Hebrew University, **Jerusalem,** ISRAEL.

L. PAL (1972), Hungarian Academy of Science, Central Research Institute for Physics, P. O. B. 49, **Budapest 114,** HUNGARY.

R. STREET (1972), Physics Department, Monash University, Clayton, **Victoria 3168,** AUSTRALIA.

E. A. TUROV (1972), Institute of Physics of Metals, Sofia Kovalevskaya str. 18, **Sverdlovsk K-66,** USSR.

E. R. WOHLFARTH (1972), Department of Mathematics, Imperial College, Prince Consort Road, **London S. W. 7,** ENGLAND.

W. ZINN (1972), Kernforschungsanlage Jülich GMBH, Institut 4: Magnetimus, **517 Jülich,** BRD.

10 — COMMISSION ON SOLID STATE PHYSICS (1960)

Chairman:

Prof. E. F. BERTAUT (1966), Laboratoire des Rayons X, B. P. No 166 Centre de Tri, **Grenoble 38042**, FRANCE.

Secretary:

Prof. G. SZIGETI (1966), Research Inst. for Technical Physics, The Hungarian Academy of Sciences, Postfach 76 — Ujpest 1, **Budapest IV,** HUNGARY.

Members:

M. BALARIN (1972), Material Science Research, Deutsche Akademie der Wissenschaften, Rudower Chaussee 5, **DDR-1199 Berlin,** DDR.

D. D. BARB (1972), Institute for Atomic Physics, P. O. B. 35, **Bucharest,** ROMANIA.

R. BLINC (1969), Institute "J. Stefan", **Ljubljana** (Jamova 39), YUGOSLAVIA.

J. A. E. DIEHL (1972), The Max-Planck Inst. for Metals Research, Seestrasse 95, **D-7 Stuttgart,** BRD.

H. EHRENREICH (1972), Div. of Eng. and Applied Physics, Harvard University, **Cambridge,** Mass., USA.

F. FUMI (1972), Istituto Nazionale de Fisica Nucleare, Università di Genova, Viale Benedetto XV, **Genova,** ITALIA.

S. C. JAIN (1969), Solid State Physics Laboratory, Ministry of Defence, Lucknow Road — **Delhi 7,** INDIA.

L. V. KELDYSH (1972), Fizika-Tehnicseszkij Insztitut, Academy of Sciences of the USSR, Politechnicheskaja ul. 26, **Leningrad K-21,** USSR.

A. KELLER (1972), H. H. Wills Physics Laboratories, University of Bristol, Royal Fort, Tyndall Avenue **Bristol BS8 1TL,** ENGLAND.

G. K. WHITE (1972), National Standards Laboratory, University Grounds, **Chippendale, NSW 2008,** AUSTRALIA.

Associate:

From IUCr: J. M. COWLEY (1969), Dept. of Physics, Arizona State University, **Tempe,** Arizona 85281, USA.

11 — COMMISSION on PARTICLES and FIELDS (1957)

Chairman:

Prof. C. N. YANG (1969), Inst. for Theoretical Physics, State University of New York at Stony Brook, **Stony Brook, N.Y. 11790, USA.**

Secretary:

Prof. G. SALVINI (1969), Instituto Fisica Università, Piazzale delle Scienze 5, **Rome 00185,** ITALIA.

Members:

G. EKSPONG (1969), Institute of Physics, The University of Stockholm, Vanadisvägen 9, **S-113 46 Stockholm,** SWEDEN.

E. L. GOLDWASSER (1972), National Accelerator Laboratory, P.O. Box 500, **Batavia,** Ill. 60510, USA.

B. P. GREGORY (1972), Lab. de Physique nucléaire des hautes énergies, École Polytechnique, 17 rue Descartes, **Paris Ve,** FRANCE.

H. JOOS (1969), Deutsches Elektronen-Synchrotron DESY, University of Hamburg, Notkestieg 1, **D-2 Hamburg 52,** BRD.

A. A. LOGUNOV (1969), Institute of High Energy Physics, **Serpukhov,** USSR.

Y. NE'EMAN (1969), Department of Physics, Tel-Aviv University, Ramat-Aviv, **Tel-Aviv,** ISRAEL.

P. PNIEWSKI (1969), Institute of Experimental Physics, University of Warsaw, Hoza 69, **Warszawa,** POLAND.

G. TAKEDA (1972), Department of Physics, Tohoku University, Katahira-cho, **Sendai,** JAPAN.

A. N. TAVHELIDZE (1972), Joint Institute for Nuclear Research, Head Post Office, P.O. Box 79, **Moscow,** USSR.

B. M. UDGAONKAR (1968), Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, **Bombay 5,** INDIA.

12 — COMMISSION on NUCLEAR PHYSICS (1960)

Chairman:

Madame H. FARAGGI-MATHIEU (1972), Département de Physique nucléaire, Commissariat de l'Energie atomique, 53 rue Fontaine-Grelot, **Bourg-la-Reine F-92,** FRANCE.

Secretary:

Prof. J. L. FOWLER (1966), Physics Division, Oak Ridge National Laboratory, P.O. Box X, **Oak Ridge,** Tenn. 37830, USA.

Members:

F. AJZENBERG-SELOVE (1972), Department of Physics, University of Pennsylvania, **Philadelphia,** Penn. 19104, USA.

E. BAUMGARTNER (1969), Physikalisches Institut der Universität, Klingelbergstrasse 82, **Basel 4000,** SWITZERLAND.

E. M. FRANK (1967), Academy of Sciences of the USSR, Leninskii prospekt 14, **Moscow B-71,** USSR.

B. MOTTELSON (1972), NORDITA, Blegdamsvej 17, **Copenhagen DK-2100,** DENMARK.

T. MAYER-KUCKUK (1972), Radiation and Nuclear Physics Inst., Faculty of Math. and Natural Sciences, University Bonn, Nullallee 14—16, **D-53 Bonn,** BRD.

M. PETRASCU (1972), Institute for Atomic Physics, P.O. Box 35, **Bucharest,** ROMANIA.

R. A. RICCI (1969), Istituto di Fisica G. Galilei, University of Padua, Via Marzolo 8, **Padova 35100,** ITALIA.

M. SAKAI (1969), Institute for Nuclear Study, University of Tokyo, Midori-cho 3-2-1 — Tanashi-shi, **Tokyo,** JAPAN.

I. ULEHLA (1972), Department of Theoretical Physics, Faculty of Math. and Physics, Charles University, V luhu 14, **Praha 14,** CZECHOSLOVAKIA.

J. C. WILLMOTT (1972), Physics Department, Schuster Laboratory, The University, **Manchester M13 9PL,** ENGLAND.

13 — COMMISSION on ATOMIC MASSES and FUNDAMENTAL CONSTANTS (1960)

Chairman:

Dr. E. R. COHEN (1966), Science Center, Aerospace and Systems Group, North American Rockwell Corp., 1049 Camino dos Rios, **Thousand Oaks,** Calif. 91360, USA.

Secretary:

Dr. W. H. JOHNSON (1966), School of Physics, University of Minnesota, **Minneapolis,** Minn. 55455, USA.

Members:

R. C. BARBER (1972), Department of Physics, University of Manitoba, **Winnipeg,** CANADA.

V. I. GOLDANSKY (1972), Inst. of Chemical Physics, Academy of Sciences of the USSR, Vorobyevskoe shosse 2b, **Moscow B-334,** USSR.

K. OGATA (1966), 1-1 Machikaneyama-cho, Toyonaka-shi, **Osaka-fu,** JAPAN.

J. H. SANDERS (1969), Clarendon Laboratory, Oxford University, **Oxford** UNITED KINGDOM.

H. H. STAUB (1966), Physik-Institut der Universität, Schonberggasse 9, **Zurich 8001,** SWITZERLAND.

U. STILLE (1960), Physikalisch-Technische Bundesanstalt, Bundesallee 100, **D-33 Braunschweig,** BRD.

J. TERRIEN (1966), Bureau int. des Poids et Mesures, Pavillon de Breteuil, **Sèvres F-92,** FRANCE.

A. H. WAPSTRA (1960), Institute for Nuclear Physics Research, Oosterringdijk 18, Postbus 4395, **Amsterdam 1006,** NETHERLANDS.

14 — COMMISSION on PHYSICS EDUCATION (1960)

Chairman:

Dr. W. C. KELLY (1966), National Research Council, 2101 Constitution Avenue N.W., **Washington,** D.C. 20418, USA.

Secretary:

Prof. J. L. LEWIS (1969), Science Department, Malvern College, **Malvern,** Worcestershire, ENGLAND.

Members:

G. DELACOTE (1972), École normale supérieure, 24, rue Lhomond, **Paris 75,** FRANCE.

E. FERREIRA (1972), Dept. Physics-Pontificia, Universidade Catolica, **Rio de Janeiro,** BRASIL.

A. P. FRENCH (1972), Department of Physics, Room 20-C-224, Massachusetts Institute of Technology, **Cambridge,** Mass. 02139, USA.

A. HARASHIMA (1969), International Christian University, Mitaka, **Tokyo,** JAPAN.

L. S. KOTHARI (1969), 5 University Road, **Delhi,** INDIA.

W. KROEBEL (1969), Department of Applied Physics, University of Kiel, Neue Universität Haus 34, Olshausenstrasse, **D-23 Kiel,** BRD.

A. N. MATVEYEV (1972), Physics Department, Moscow State University, **Moscow,** USSR.

E. NAGY (1969), Institute for Solid State Physics, Eötvös University, Muzeum krt. 6-8, **Budapest VIII,** HUNGARY.

J. WERLE (1969), Dept. of Mathematics and Physics, Warsaw University, **Warsaw,** POLAND.

15 — COMMISSION on ATOMIC & MOLECULAR PHYSICS and SPECTROSCOPY (1966)

Chairman:

Dr. L. M. BRANSCOMB (1966), Chief Scientist and Vice-President, IBM Corporate Headquarters, **Armonk,** N.Y., USA.

Secretary:

Prof. H. L. WELSH (1969), Physics Department, University of Toronto, **Toronto 181,** CANADA.

Members:

J. BROSSEL (1972), Laboratoire de Physique, École normale supérieure, 24 rue Lhomond, **Paris 75,** FRANCE.

A. GOZZINI (1972), University of Pisa, Via Nazario Sauro 22, **Pisa,** ITALIA.

J. B. HASTED (1972), Physics Department, Birkbeck College, Malet Street, **London WC1C 7HU,** ENGLAND.

J. H. HERTZ (1969), Zentralinstitut für Optik und Spektroskopi, Rudower Chaussee 5, **DDR-1199 Berlin-Adlershof,** DDR.

R. N. ILIIN (1972), Physico-Technical Institute, Polytechnical str. 26, **Leningrad K-21,** USSR.

I. KOVACS (1969), Department of Atomic Physics, Polytechnical University, XI. Budafoki ut 8, **Budapest 112,** HUNGARY.

G. zu PUTLITZ (1972), I. Phys. Institut University, Philosophenweg 12, **D-69 Heidelberg,** BRD.

T. SKALINSKI (1969), Institute of Physics, Polish Academy of Sciences, Al. Lotnikow 32/46, **Warszawa,** POLAND.

K. TAKAYANAGI (1969), Institute of Space and Aeronautical Sc., University of Tokyo, Komaba — Meguro-ku, **Tokyo,** JAPAN.

A. WALSH (1969), Division of Chemical Physics, David Rivett Laboratory, C.S.I.R.O., P.O. Box 160, Clayton, **Victoria 3168,** AUSTRALIA.

16 — COMMISSION on PLASMA PHYSICS (1969)

Chairman:

Prof. S. C. BROWN (1966), Department of Physics, Room 20A-125, Massachusetts Inst. of Technology, **Cambridge,** Mass. 02139, USA.

Secretary:

Dr. R. S. PEASE (1969), Culham Laboratory, **Culham,** Abingdon, Berkshire, ENGLAND.

Members:

C. M. BRAAMS (1969), FOM-Instituut voor plasma-fysica, **Rijnhuizen-Jutphaas,** NETHERLANDS.

B. BRUNELLI (1969), Laboratori Gas Ionizzati, CNEN, **Frascati,** ITALIA.

J. L. DELCROIX (1969), Division de Physique des Plasmas, Université de Paris-Sud, **90 Orsay,** FRANCE.

G. ECKER (1972), Division of Theoretical Physics, Ruhr-Universität Bochum, Buschey Str., **D-463 Bochum-Querenburg,** BRD.

M. B. GOTTLIEB (1972), Plasma Physics Laboratory, Forrestal Research Center, P. O. Box 451, **Princeton,** N. J. 08540, USA.

J. KRACIK (1972), Department of Physics, Fac. El. eng. Czech. Techn. Univ., Ceskomalinski 17, **Praha 6,** CZECHOSLOVAKIA.

I. POPESCU (1969), Institute of Physics, **Bucharest,** ROMANIA.

L. ROTHHARDT (1969), Deutsche Akademie der Wissenschaften, Zentralinstitut für Elektronenphysik, Institutsteil VI — Magnetoplasmadynamik, Fröbelstieg 3, **DDR-69 Jena,** DDR.

R. Z. SAGDEEV (1972), Institute of High Temperatures, USSR Academy of Siences, Leninsky Prospect 14, **Moscow B-71,** USSR.

E. S. WEIBEL (1969), Centre de Recherche en Physique des Plasmas, Avenue des Bains 21, **Lausanne 1007,** SUISSE.

Associate:

From the International Scient. Committee on Ionized Gases: R. F. FRANKLIN, Clarendon Laboratory, Oxford University, **Oxford,** UNITED KINGDOM.

IUPAP DELEGATES to INTER-UNION COMMISSIONS

I.1 — **International Council of Scientific Unions (ICSU)**

H. MAIER-LEIBNITZ (1972), Deutsche Forschungsgemeinschaft, Kennedyallée 40, **5300 Bonn-Bad Godesberg 1,** BRD.

I.2 — **Scientific Committee on Oceanic Research (SCOR)**

Sir E. BULLARD (1966), Department of Geodesy and Geophysics, Madingley Road, **Cambridge,** UNITED KINGDOM.

I.3 — **Special Commission for Space Research (COSPAR)**

B. PETERS (1972), Danish Space Research Institute, Lundtoftevej 7, **Lyngby 2800,** DENMARK.

I.4 — **Inter-Union Commission on Solar Terrestrial Physics (IUCSTP)**

B. PETERS (1972), Danish Space Research Institute, Lundtoftevej 7, **Lyngby 2800,** DENMARK.

I.5 — **ICSU — CODATA**

N. KURTI (1972), Department of Physics, Parks Road, Oxford University, **Oxford, OXI 3PU,** UNITED KINGDOM.

I.6 — **IUPAC — Polymers**

G. W. BECKER (1972), Bundesanstalt für Materialprüfung, Unter den Eichen 87, **D-1 Berlin 45,** BRD.

I.7 — **ICSU — Abstracting Board**

J. ZIMAN (1972), Physics Department, Bristol University, **Bristol,** UNITED KINGDOM.

I.8 — **Committee on the Teaching of Sciences (ICSU)**

H. H. STAUB (1969), Institut de Psysique, Université de Zurich, Schonberggasse 9, **Zurich 8001,** SUISSE.

I.9 — **European Physical Society**

C. C. BUTLER (1972), Nuffield Lodge, Regents Park, **London NW1 4RS,** ENGLAND.

I.10 — **SCOPE**

A. LARA (1972), Centro de Investigaciones Fisicas, Serrano 144, **Madrid 6,** ESPANA.

I.11 — **ICO**

T. SKALINSKI (1972), Institute of Physics, Polish Academy of Sciences, Al. Lotnikow 32/46, **Warszawa,** POLAND.

I.12 — **ICSU — Spectroscopy Committee**

G. HERZBERG (1966), Division de Physique pure, Conseil national de Recherches, **Ottawa 7,** CANADA.

A. KASTLER (1966), Laboratoire de Psysique, École normale supérieure, 24, rue Lhomond, **Paris 75,** FRANCE.

W. C. PRICE (1966), Physics Department, King's College, Strand, **London W. C. 2,** UNITED KINGDOM.

I.13 — **Bureau International des Poids et Mesures**

J. deBOER, Instituut voor Theoretische Fysica, Universiteit van Amsterdam, Valckenierstraat 65, **Amsterdam-O,** NETHERLANDS.

I.14 — **IUPAC Units Committee**

U. STILLE, Physikalisch-Technische Bundesanstalt, Bundesallee 100, **D-33 Braunschweig,** BRD.

I.15 — **Committee on Sience and Technology in Developing Countries (COSTED)**

S. BHAGAVANTAM, Indian Institute of Science, **Bangalore 560012,** INDIA.

UNION INTERNATIONALE DE LA PHYSIQUE
PURE ET APPLIQUÉE

INFORMATION GÉNÉRALE

RAPPORT DE LA XIV^{ème}
ASSEMBLÉE GÉNÉRALE
WASHINGTON DC, 1972

IUPAP — 17 1973

TABLE DES MATIÈRES

I — FONCTIONNEMENT DE L'UNION

L'historie de l'Union internationale de Physique pure et appliquée est résumée dans huit publications antérieures (documents IUPAP 1, 2, 4, 5, 7, 8, 10 et 14).

L'Union est constituée par les comités nationaux de Physique ou associations de physiciens des divers pays adhérents. Ces comités délèguent des mebres aux Assemblées générales de l'Union qui ont lieu tous les trois ans. L'Assemblée générale pourvoit à l'élection du bureau d'administration, à la nomination des diverses commissions spéciales et à la désignation de ses représentants auprès de plusieurs comités groupant les différentes unions scientifiques.

Les Assemblées générales antérieures ont eu lie à Bruxelles (1923 et 1925), à Paris (1931 et 1947), à Londres (1934 et 1954), à Varsovie (1963), à Bâle (1969), à Dubrovnik (1969), et à Washington, D.C. (1972). Le Comité exécutif se réunit une fois par année.

L'union est rattachée au Conseil international des Unions scientifiques (C.I.U.S.). Le Conseil est constitué en ce moment de 17 unions et d'une soixantaine de délégués nationaux. Le Président du Conseil est le Professeur J. Coulomb (France) et le Secrétaire-général est le Professeur F. A. Stafleu (Pays-Bas), Les bureaux administratifs se trouvent à Paris (51, Bd de Montmorency, 75016 Paris, France).

L'Assemblée générale du C.I.U.S. est constituée par des représentants des unions scientifiques et des délégués nationaux. A l'avenir, cette assemblée se réunira tous les deux ans.

En 1946, le C.I.U.S. a conclu un accord avec l'Organisation des Nations-Unies pour l'Éducation, la Science et la Culture (UNESCO). Cet accord permet aux unions scientifiques d'obtenir, par l'intermédiare du C.I.U.S., des subventions à l'intention des congrès internationaux.

L'utilisation des subventions de l'UNESCO est soumise aux conditions suivantes:

i) l'UNESCO doit être renseignée au sujet des conférences afin de pouvoir, le cas échéant, y déléguer un représentant;

ii) l'UNESCO entend que son appui soit mentionné sur la couverture de toutes les publications faites par des organismes ayant bénéficié de subventions à cet effet. La formule suivante est recommandée: "Publié avec le concours financier de l'UNESCO";

iii) l'UNESCO demande qu'on lui envoie dix exemplaires de tous les rapport issus d'une conférence.

Des conférences et des assemblées de commissions peuvent également être subventionnées par les fonds provenant des membres nationaux de l'IUPAP. Ces fonds servent aussi à faire face aux dépenses de l'administration.

La correspondance traitant des questions financières et nationales doit être envoyée au Secrétaire-général. Cependant, la correspondance traitant les commissions et la publicité générale doit être envoyée au Secrétairegénéral adjoint.

II — STATUTS DE L'UNION

(Votés par l'Assemblée générale de 1931 et modifiés par celles de 1948 et 1954; le texte du § 5 adopté en 1960 est indiqué en *italiques).*

I. Buts de l'Union et conditions d'admission

1. L'Union a pour but:

(i) de créer et d'encourager une coopération internationale en physique;

(ii) de coordonner les efforts de préparation et de publication des extraits de mémoires et de tables de constantes de physique;

(iii) de réaliser une entente internationale sur les questions d'unités, d'étalonnage, de nomenclature et de notations;

(iv) d'aider la poursuite de recherches intéressantes.

Elle peut organiser des congrès internationaux.

Dans chaque pays, l'adhésion à l'Union peut être donnée soit par son Académie nationale, soit par son Conseil national de Recherches, soit par d'autres institutions similaires, soit par des sociétés scientifiques ou groupements de telles institutions ou sociétés, soit, à défaut de ceux-ci, par son Gouvernement.

Pour un même pays, des adhésions données séparément par plusieurs organisations distinctes ne peuvent être admises que sous la réserve d'une entente préalable entre ces organisations pour la répartition des cotisations et le partage des droits de vote.

Dans le mot pays sont compris les dominions, les protectorats diplomatiques, ainsi que les territoires ayant une activité scientifique indépendante.

II. Comités nationaux

2. Un comité national est constitué dans chacun des pays adhérents comme organisme de liaison avec l'Union. Il est créé sur l'initiative soit de son Académie nationale, soit de son Conseil national de Recherches ou d'autres institutions ou groupements d'institutions nationales similaires, soit, à défaut de ceux-ci, de son Gouvernement.

3. Les comités nationaux ont pour fonction de faciliter et de coordonner, sur leurs territoires respectifs, l'étude des diverses branches de la Physique, envisagées principalement du point de vue international. Chaque comité national soit seul, soit de concert avec un ou plusieurs autres comités nationaux, a le droit de soumettre à l'Union des questions à discuter entrant dans la compétence de celle-ci.

Les comités nationaux désignent les délégués chargés de les représenter aux assemblées de l'Union.

Ils désignent un chef de délégation qui a qualité pour voter au nom de son comité sur les questions d'ordre administratif, ainsi qu'il est prévu aux articles 14 et 16.

III. Administration de l'Union

4. Les travaux sont dirigés par l'Assemblée générale des délégués.

5. *Comité exécutif de l'Union comprend: le Président, le précédent Président, le premier Vice-président, les Vice-présidents et le Secrétaire-général. A l'exception de l'ancien président, les membres du Comité sont élus par l'Assemblée générale; ils demeurent en fonction jusqu'à la fin de l'Assemblée générale ordinaire qui suit celle de leur élection. Le premier Vice-président remplace le Président en cas d'absence de ce dernier.*

A l'exception du Secrétaire-général, les membres élus du Comité exécutif ne peuvent exercer une même fonction sans interruption pendant plus de deux périodes séparant les assemblées générales ordinaires.

Le comité exécutif peut pourvoir aux départs qui surviendraient dans son sein. Toute personne désignée dans ces conditions achève le mandat de celle qu'elle remplace.

Il existe, en outre, un *Bureau administratif* qui, sous la direction du Secrétaire-général de l'Union, expédie la correspondance, gère les ressources et assure la conservation des archives ainsi que la préparation et la distribution des publications approuvées par l'Assemblée générale.

IV. Commissions

6. L'Assemblée générale et, sous réserve d'approbation par l'Assemblée générale suivante, le Comité exécutif peuvent décider la création de commissions propres à l'Union de Physique et la participation à des *commissions mixtes,* communes à l'Union de Physique et à une ou plusieurs autres.

Parmi les commissions propres à l'Union, certaines, dites *commissions affiliées,* sont consacrées aux grands domaines de la Physique, d'autres, à objectif plus limité, sont dites *commissions spécialisées.*

Toutes les commissions doivent, par l'entremise de leur secrétaire, présenter à chaque Assemblée générale un rapport sur leurs travaux.

7. La constitution, les statuts, le fonctionnement et la situation financière des commissions *affiliées* sont soumis à l'approbation du Comité exécutif de l'Union qui doit veiller notamment à ce que leurs domaines d'action soient délimités au mieux.

Le Comité exécutif désigne un ou plusieurs de ses membres pour représenter l'Union au sein de chaque commission affiliée.

Les commission affiliées peuvent, en plus des ressources qui leur sont affectées par l'Union, percevoir des cotisations spéciales et recevoir des dons d'autres sources.

8. Les membres des commissions *spécialisées* et les représentants de l'Union au sein des commissions mixtes sont élus par l'Assemblée

générale, après examen des propositions du Comité exécutif de l'Union. Ils restent en fonction jusqu'à la fin de l'Assemblée générale suivante et sont rééligibles.

Les commissions spécialisées peuvent s'adjoindre des membres, sous réserve d'approbation du Comité exécutif.

La désignation des membres des commissions *affiliées* en plus des représentants du Comité exécutif de l'Union de Physique prévus à l'article 7, est fixée par leurs statuts particuliers.

Le fonctionnement des commissions *mixtes* est réglé par le Conseil international des Unions scientifiques.

V. Assemblées générales

9. L'Union se réunit en principe tous les trois ans en Assemblée générale ordinaire. Si l'époque et le lieu de cette réunion n'ont pas été arrêtés par l'Assemblée générale précédente, ils sont fixés par le Comité exécutif et communiqués, quatre mois à l'avance, aux organismes adhérents.

10. Dans des cas spéciaux, le Président peut, avec le consentement du Comité exécutif, convoquer une Assemblée extraordinaire; il est tenu de la faire à la demande d'un tiers des voix des pays adhérents.

11. Tous les membres des comités nationaux peuvent assister aux réunions de l'Assemblée générale et prendre part aux discussions, mais seulement avec voix consultative.

Le Président de l'Union peut inviter des hommes de sciences, non délégués, à assister, à titre consultatif, aux séances de l'Assemblée générale.

Les membres non-délégués des commissions mentionnées à l'article 7 ont le droit d'assister, dans les mêmes conditions, aux séances de l'Assemblée générale où sont traitées les questions entrant dans leurs attributions.

12. L'ordre du jour d'une session est fixé par le Comité exécutif et communiqué au moins quatre mois avant l'ouverture de cette session. Toute question ne figurant pas à l'ordre du jour n'est prise en considération qu'avec l'assentiment préalable de la moitié au moins des voix des pays représentés à l'Assemblée générale.

VI. Congrès internationaux

13. Les congrès internationaux sont organisés par le Comité exécutif de l'Union.

VII. Budget et droit de vote

14. Le Comité exécutif prépare un budget de prévision pour chaque année de la période comprise entre deux sessions. Une Commission financière, nommée par l'Assemblée générale, est chargée de l'étude de ce budget et de la vérification des comptes de l'exercice présédent. Elle établit, sur ces deux questions, des rapports disincts qui sont soumis à l'Assemblée générale.

A la suite de cet examen financier, l'Assemblée générale fixe le taux de la part contributive unitaire (*).

Le montant de la cotisation est le produit du "taux de la part unitaire" par le nombre de "part contributives" du pays considéré. Ce nombre est fixé par le Comité exécutif, après examen des observations éventuelles du Comité national intéressé; il peut, quand cela paraît opportun, être modifié par un accord entre le Comité exécutif et le Comité national intéressé.

Il est dans tous les cas soumis à la ratification de l'Assemblée générale qui suit sa fixation ou sa modification.

Le nombre de délégués officiels de chaque pays et celui des voix attribuées à chaque délégation sont fixés par le barème suivant:

Nombre de parts contributives:	1,	2 ou 3,	4 à 6,	7 à 9,	10 et au-dessus

*Ce taux est fixé à $300 dollars U.S. à partir du 1er janvier 1971.

Nombre de délégués
officiels (et de voix): 1, 2, 3, 4, 5

Dans chaque pays les organismes adhérents sont responsables du paiement des cotisations.

15. Les recettes de tout ordre de l'Union provenant des contributions des divers pays sont consacrées:

(i) à payer les frais de publications et les dépenses accessoires d'administration;

(ii) à atteindre les buts prévus à l'article 1.

Les ressources provenant de dons sont utilisées par l'Union en tenant compte des désirs exprimés par les donateurs.

Tout pays qui se retire de l'Union abandonne de ce fait ses droits à l'actif de l'association.

16. Dans les Assemblées générales, les résolutions concernant les questions d'ordre scientifique sont prises à la majorité des voix de tous les délégués présents.

Pour les questions d'ordre administratif et pour les questions mixtes, le vote a lieu par pays, le nombre de voix de chaque pays étant fixé à l'article 14.

S'il y a doute sur la catégorie dans laquelle doit être rangée une question à discuter, le Président décide.

Dans les commissions, les décisions sont prises à la majorité des voix des membres qui les composent et non par pays.

En toutes circonstances, s'il y a égalité de voix, celle du Président est prépondérante.

17. Pour les questions administratives figurant à l'ordre du jour, un pays qui n'est par représenté peut envoyer par écrit son vote au Président. Pour être valable, ce vote doit être reçu avant le dépouillement du scrutin.

VIII. Règlements intérieurs

18. L'Assemblée générale peut édicter des règlements intérieurs concernant soit la conduite de ses travaux, soit les devoirs généraux qui incombent aux membres du Comité exécutif, soit en général, tous objets non prévus dans les statuts.

De même, chaque Commission peut élaborer des règlements pour la conduite de ses propres travaux. Aucun de ces règlements ne peut contenir de prescriptions contraires aux termes des présents statuts.

IX. Durée de l'Union et modifications aux statuts

19. La durée de l'Union n'est pas limitée.

20. Aucun changement ne pourra être apporté aux présents statuts sans l'approbation des deux tiers des voix de l'ensemble des pays adhérents.

21. En cas de dissolution de l'Union, votée par l'Assemblée générale à la majorité des deux tiers des voix de l'ensemble des pays adhérents, les fonds disponibles seront attribués par l'Assemblée à une ou plusieurs organisations scientifiques.

22. Le présent texte français servira exclusivement pour l'interprétation à donner aux articles des présents statuts.

ANNEXE A

Procédure de Nomination des Membres des Commissions par l'Assemblée Générale

Ces articles sont conformes aux Statuts. Cependant, il ne sont pas status eux-mêmes, mais seulement règles de procédure. Ils peuvent être adoptés ou changés par chaque Assemblée Générale.

1. Chaque Commission (sauf la Commission des Finances) consistera de:

   Président
   Secrétaire
   5 à 10 membres.

2. Les Commissions aviseront le Comité Exécutif du nombre de Membres approprié pour leurs travaux: L'exécutif fera des recommandations à chaque Assemblée qui fixera le nombre de Membres des Commissions avant que les élections aient lieu.

3. *Présidents des Commissions*

Les présidents seront élus pour 3 ans, normalement après 3 (ou exceptionnellement 6) ans en tant que secrétaire ou membre ordinaire de leur Commission. Dans des circonstances exceptionnelles, un Président peut devenir un membre ordinaire de la Commission pour 3 ans après sa période en tant que Président.

4. *Secrétaires des Commissions*

Les Secrétaires seront élus pour 3 ans, après 3 ans de service dans la Commission. Les Secrétaires seront éligibles pour un second et final cycle de 3 ans. Pour SUN et "Atomic Masses Commissions", les Secrétaires pourront être élus après 6 ans de service dans leur Commission.

5. *Membres des Commissions*

Les membres des Commissions seront élus pour 3 ans et seront éligibles pour un autre terme de 3 ans.
Des exceptions à cette règle sont permises pour les Membres des Commissions qui ont des taches très spécialisées et indubitablement ont besoin des services de leurs Membres pour plus que 6 ans.

6. *Variété de Nationalités des Membres d'une Commission*

Les Membres de chaque Commission (à l'exception du Président et du Secrétaire) doivent tous venir de pays différents adhérents à l'IUPAP.

Le travail de quelques Commissions peut être entravé par cette règle. Elles doivent présenter leur cas à l'Exécutif et, si l'approbation est donnée, l'Exécutif fera une recommandation à L'Assemblée Générale pour la ratification avant que les élections aient lieu.

7. *Membres Associés*

Quelques Commissions ont établi des liaisons valables avec plusieurs unions scientifiques et d'autres organisations internationales. Elles peuvent désirer demander à ces organisations de nommer des experts dans ces domaines pour devenir membres associés des Commissions IUPAP. (IUPAP sera invitée à nommer des physiciens comme membres associés des Commissions établies par d'atutres Unions.)

Le nombre maximum de membres associés de n'importe quelle Commission doit être normalement de quatre.

Les membres associés ne sont pas autorisés à voter aux Réunions des Commissions, pas plus qu'ils sont éligibles au soutient financier de l'IUPAP concernant voyages et dépenses de subsistance.

8. L'Exécutif reconnait qu'il ne peut pas être possible d'appliquer toutes ces règles concernant la durée de service immédiatement en 1972.
Quand de nouvelles Commissions sont établies, des arrangements *ad hoc* auront besoin d'être effectués jusqu'à ce qu'un roulement normal des Membres puisse être établi.

9. *Procédure d'élection pours les Membres des Commissions*

9.1. Les Comités Nationaux et les Commissions seront invités à suggérer des noms de membres au Secrétaire Général (y compris pour les positions de Président et de Secrétaire) pour les Commissions à partir de quatre mois avant l'Assemblée Générale. Chaque nom proprosé doit être accompagné de brefs details de la carrière du physicien et des postes précédemment tenus, et, pour les noms proposés par les Commissions, il est souhaitable que le support du Comité National du candidat puisse être obtenu. Un formulaire spécial va être délivré dans ce but. Le Secrétaire Général (ou le Secrétaire Général Associé) fera circuler tous les noms reçus avant la date limite dans les Comités Nationaux, 3 mois avant l'Assemblée Générale.

9.2. Le Comité Exécutif considèrera tous les noms suggérés (et suggèrera lui-même des noms) et préparera par conséquent une liste des noms pour les membres des Commissions, liste qui servira de base de discussion à l'Assemblée.

En préparant les listes des noms pour les Commissions, l'Exécutif s'efforcera d'obtenir une satisfaisante propagation mondiale des candidatures à la Commission. L'Exécutif publiera sa proposition de liste des membres des Commissions aussitôt que possible mais avant le commencement de l'Assemblée Générale.

9.3. Après la publication de la liste des noms recommandés par le Comité Exécutif il peut apparaître qu'une personne ne veuille pas servir en tant que Président, Secrétaire ou membre. Dans ce cas, ou si des conseils sont reçus des Comités Nationaux ou Commissions, le Comité Exécutif fera des propositions convenables, par exemple il peut changer le nom d'un des proposés avec un des membres proposés ou même introduire un nouveau nom. La liste finale de noms du Comité Exécutif sera publiée très tôt à l'Assemblée, à temps pour la discussion générale.

9.4. Après la discussion générale, les délégations nationales individuelles participant à l'Assemblée auront la possibilité de réintroduire des noms sur la liste des noms suggérés et de les ajouter à la liste finale de l'Exécutif jusqu'à une date limite convenue et en utilisant des formulaires de nomination appropriés. Les noms ne figurant pas sur la liste originale peuvent seulement être introduits avec l'accord de l'Assemblée Générale. A ce stade, chaque proposition doit être secondée par une autre délégation. Si un candidat n'est pas de la même nationalité que le proposant, le candidat devra être alors proposé par sa propre délégation nationale.

9.5. Dans le cas de circonstances imprévues (par exemple un retrait de candidature) modifiant la liste des élus après que la limite finale soit passée, le Secrétaire Générale, après consultation avec les membres de l'Exécutif, ajoutera autant de noms qu'il est nécessaire pour compléter la liste. La liste modifiée sera présentée à l'Assemblée Générale pour ratification.

9.6. Si plus de noms sont inclus à la liste finale ratifiée que le nombre de places vacantes pour une ou plusieurs Commissions le permet, alors des votes secrets seront tenus. La procédure de vote sera la même que celle adoptée pour le choix des membres du Comité Exécutif. Les votes doivent être conformes au paragraphe (6).

9.7. La procédure pour remplir des vacances occasionelles qui subviendraient dans la Commission entre des réunions de l'Assemblée Générale sera la même que pour des vacances occasionnelles dans le Comité Exécutif (statut 5).

ANNEXE B

Nombres de Membres pour les Commissions IUPAP pour la période 1973—75

Chaque Commission consiste d'un Président et un Secrétaire ainsi que des membres ordinaires, tous élus par l'Assemblée Générale. Le nombre des membres ordinaires est le suivant:

C. 2	SUN	10 membres
C. 3	Thermodynamics and Statistical Mechanics	10 membres
C. 4	Cosmic Rays	8 membres
C. 5	Very Low Temperature	9 membres
C. 6	Publications	10 membres
C. 7	Acoustics	10 membres
C. 8	Semiconductors	8 membres
C. 9	Magnetism	10 membres
C.10	Solid State Physics	10 membres
C.11	Particles and Fields	10 membres
C.12	Nuclear Physics	10 membres
C.13	Atomic Masses and Fundamental Constants	8 membres
C.14	Education	9 membres
C.15	Atomic and Molecular Physics and Spectroscopy	10 membres
C.16	Plasma Physics	10 membres