

# REPORT OF THE EXECUTIVE COMMITTEE 1964-1967\*

ACTIVITY OF THE INTERNATIONAL ASTRONOMICAL UNION

(voir texte français, page ix)

## INTRODUCTION

The present report covers the period from 1 January 1964 to 31 December 1966. For the sake of continuity, it has been prepared in accord with the principles governing previous reports, especially that of the period 1961-1963, formally approved by the twelfth General Assembly, and published in Volume XII B of the *Transactions*.

The period under report includes the first half of the year 1964 (until 25 August 1964) which fell under the responsibility of the former Executive Committee. On the other hand, it does not include the first half of the year 1967, still within the responsibility of the present Executive Committee. An oral complementary report to cover this period (1 January to 21 August 1967) will be presented to the thirteenth General Assembly and, if approved, published in Volume XIII B of the *Transactions*.

The Executive Committee has reached a number of decisions during this period. Those in connection with the twelfth General Assembly, or approved by it, were published in Volume XII B of the *Transactions* and will not be repeated here. Those taken at later dates have been published in the *IAU Information Bulletin*, and will be referred to in the appropriate paragraphs that follow. Reports on the activity of IAU Commissions, Inter-Union Commissions, Astronomical Services, etc., published in the *Information Bulletin*, have been incorporated into the Draft Reports of Commissions, in so far as they still apply.

The most serious problems of the Union are those concerning publication and finance; they are dealt with in two separate appendices.

A third appendix is devoted to factual data concerning Adhering Countries and IAU Members. Four administrative Commissions (5, 6, 38 and 46) are now treated as committees of the Executive Committee; their reports follow immediately after this Report, on page lxxv. The final reports of the President of IUCSTR (Inter-Union Commission on Solar and Terrestrial Relationships), of which the IAU was the parent Union, and of the President of the Working Group on Photographic Materials, are also added to the present Report, on page xcix.

### *Structure and Administration of the IAU*

Since the twelfth General Assembly, the International Astronomical Union has operated in accord with the provisions of the new Statutes, as adopted at that General Assembly.

#### *Administration*

The Executive Committee has had to cope with a great intensification in the activity of the Union: the number of its Members increased, as did that of its Commissions and Adhering Organizations; relations with other organizations became more involved.

This difficult situation was met, in the summer of 1964, by adding a shorthand-typist to the existing staff. Moreover, the General Secretary and the Assistant General Secretary had the benefit of the services of several assistants, in both Meudon and Prague, generously

\*Note. The text of the report and of its Appendices I and II are hereafter published in two languages. The French text being the original, from which the English text has been translated, is the only one to be authoritative, in case of need.

provided by the French and Czechoslovak authorities. Evidently, though re-inforced by one additional member, the staff of the Administrative Office of the Union is still largely insufficient.

The Executive Committee realizes that, the financial situation of the Union being as it is, no improvement is possible in the near future. The only remedy seems to be in a simplification of IAU administration, rather cumbersome the last years: partly for this reason, it has been decided to curtail the IAU Distribution List and to arrange for the Symposium volumes to be published by a commercial firm from Symposium no. 32 onwards (see page lxviii below).

#### *Meetings of the Executive Committee*

The former Executive Committee held its twenty-fifth meeting in Hamburg during the twelfth General Assembly (from 24 August to 3 September 1964) under the presidency of Professor V. A. Ambarcumjan. All members and councillors were present. The present Executive Committee held its twenty-sixth meeting in Hamburg, on 3 September 1964, under the presidency of Professor P. Swings. All members and councillors were present. The Executive Committee, presided over by Professor P. Swings, met as follows during the period under report: The twenty-seventh meeting was held at the Nice Observatory, France, from 15 to 19 September 1965; all members and councillors were present except Professor G. Haro and Professor V. A. Ambarcumjan. The twenty-eighth meeting was held in Prague, Czechoslovakia, from 16 to 20 September 1966; all members and councillors were present, except Professor Y. Hagihara and Professor V. A. Ambarcumjan, who was prevented from attending by illness.

Between meetings, the business of the Union was conducted by correspondence. Twenty-four circular letters were sent from the General Secretary and the Assistant General Secretary to the members of the Executive Committee.

#### *Members of the IAU and Adhering Countries*

New Zealand has adhered to the Union since 1964. No other modification has occurred since the twelfth General Assembly, though preliminary consultations have been held with representatives of the following countries: Algeria, Cuba, Indonesia, Iran, Nigeria and Pakistan. Columbia has applied for adhesion, and its application will be submitted to the thirteenth General Assembly.

The list of Adhering Countries and corresponding Adhering Organizations is given in Appendix III (page lxxi).

It should be noted that much thought was given to the creation of a new category of membership, that of 'Associated Adhering Countries'. Countries adhering in this category would have paid no contribution, but would have had no right to vote on questions with financial implications. The Executive Committee formed a working group from among its members to investigate this problem; but after a lengthy discussion, the Executive Committee decided, in 1966, not to ask the General Assembly to modify the Statutes to this effect.

The number of IAU Members was 1276 on 1 January 1964. Since then, the twelfth General Assembly has elected a further 352 new Members. On the other hand, the General Secretary has been informed of the decease of 56 Members, so that the Union had 1572 Members on 31 December 1964.

The list of the Members whose decease has been notified since 1 January 1964 is given in Appendix III. Unfortunately this list includes so large a number of eminent scientists that it is possible only to pay hereafter separate tribute to the memory of those who have contributed greatly to the administration of the Union:

BERTIL LINDBLAD, President of the International Astronomical Union (1948–1952), was Director of the Stockholm Observatory, Saltsjöbaden, from 1927. His achievements in the domain of the Galactic Structure (in the broadest sense) were rewarded by the award of

the Gold Medal of the Royal Astronomical Society, and the Bruce Gold Medal of the Astronomical Society of the Pacific, beside other distinctions. He was President of the Royal Swedish Academy of Sciences. He will be remembered as a good friend, full of understanding and humanity, as well as a distinguished astronomer (1895–1965).

ROBERT METHVEN PETRIE, Vice-President of the International Astronomical Union (1958–1964), was Director of the Dominion Astrophysical Observatory, Victoria, Canada. His work in the domain of stellar spectrography, applied especially to the problem of spectroscopic parallaxes, was rewarded by numerous distinctions. He was honored with the title of 'Dominion Astronomer' and was President of the Royal Astronomical Society of Canada. His colleagues will remember him as an outstanding scholar, but also as a friend full of humour and wisdom (1906–1966).

ANDRÉ DANJON, President of the International Astronomical Union from 1958 to 1961, was, before he retired, Director of the Observatoire de Paris and Professor at the Sorbonne from 1945. His achievements in the domain of photometry, his research into fundamental astronomy and, in particular, his conception and application of the impersonal prismatic astrolabe, which was given his name, brought him many distinctions, including the Gold Medal of the Royal Astronomical Society and the Gold Medal of the C.N.R.S. He was member of the Academie des Sciences de Paris, associate member of numerous foreign academic institutions and president of a number of committees in France. His colleagues and pupils will never forget how much they owe to him, and they will always treasure his memory (1890–1967).

#### *Commissions of the IAU*

The volume of *Agenda and Draft Reports* includes as usual the excellent reports prepared by the Presidents of each of the 38 Commissions of the Union, assisted by their Vice-Presidents, Organizing Committees, those responsible for the various working groups or committees formed within the Commissions, and by the Commissions themselves.

At the twelfth General Assembly, two new commissions were established: Commission 45 (Spectral Classification and Multi-Band Colour Indices), and Commission 46 (Teaching of Astronomy); the latter is regarded as a committee of the Executive Committee.

Professor R. M. Petrie has been succeeded by Professor D. S. Evans, nominated as Acting President of Commission 30 (Radial Velocities), and Professor F. L. Whipple has been nominated Acting President of Commission 6 (Astronomical Telegrams) to replace the late Dr A. G. Hogg.

Between the General Assemblies, Commissions have co-opted a number of new members from among the Members of the Union. Moreover, some Presidents wished to obtain assistance from astronomers who are non-members of the Union; they have been asked to regard them as Members for all practical purposes. The Presidents will prepare proposals for the new composition of Commissions including co-opted members and new Members to be elected by the General Assembly. The list published in Volume XII C of the *Transactions* will serve as a starting point for these proposals.

Between the General Assemblies, Commissions organized several Colloquia, and other projects financed by the IAU.

#### *Colloquia of IAU Commissions*

(held between 1 January 1964 and 31 December 1966)

IAU Colloquium on *The Position of Variable Stars in the Hertzsprung-Russell Diagram*, Bamberg, 10–15 August 1965 (Commissions 27 and 42).

IAU Colloquium on *Interstellar Grains*, Troy, New York, U.S.A., 24–26 August 1965 (Commission 34).

IAU Colloquium on *The Blanketing Effect*, Heidelberg, 17–19 March 1966 (Commission 36).

IAU Colloquium on *Late-Type Stars*, Trieste, Italy, 13–16 June 1966 (Commissions 14, 29, 35, 36).

IAU Colloquium on *Atomic Collisions*, Boulder, Colorado, U.S.A., 11–16 July 1966 (Commission 14).

IAU Colloquium on the *Evolution of Double Stars*, Uccle, 29 August–2 September 1966 (Commission 26).

*Specific Projects of Commissions, approved by the twelfth General Assembly*

The list of such projects, with the corresponding expenditure, is given on page xlvi in Appendix I to the present report, dealing with the finances of the Union. These projects are, as a rule, continuations of previous projects and thus need no comment.

It will be seen, however, that the grants allocated to *Southern Variable Stars Charts*, and to the *Catalogue of Star Clusters* have not been used. The latter project has been delayed, and the Executive Committee has now agreed to a proposal that it be published by the Publishing Office of the Academy of Sciences, Budapest, from 1967 onwards. The grant made to Dr Bateson for the *Southern Variable Stars Charts* will have to be paid in 1967.

*Specific Projects of Commissions approved, between the twelfth and thirteenth General Assemblies, by the Executive Committee*

The projects are as follows:

- (a) A new edition of the *Atlas of Representative Cometary Spectra* by the Institut d'Astrophysique de Liège, to meet the needs of many scientists.
- (b) The publication, by Dr Sahade, of the *Information Bulletin for the Southern Hemisphere*. This publication, in great demand in the Southern Hemisphere, is particularly well prepared and presented.
- (c) A new edition, in the form of a loose-leaf catalogue, of the now outdated catalogue by Rigaux, *Les Observatoires Astronomiques et les Astronomes*; this is a project of the Observatoire Royal de Belgique in Uccle. The revised form of publication will allow the catalogue to be kept up to date.

*Symposia*

*IAU Symposia*

During the period covered by the present report, the following symposia were organized by the Union:

no.	Subject	Place	Date
23	Astronomical Observations from Space Vehicles	Liège	August 1964
24	Spectral Classification and Multi-Colour Photometry	Saltsjöbaden	August 1964
25	The Theory of Orbits in the Solar System and in Stellar Systems	Thessaloniki	August 1964
26	Abundance Determination in Stellar Spectra	Utrecht	August 1964
27	The Construction of Large Telescopes	Tucson, Pasadena	April 1965
28	Cosmical Gas Dynamics. V. Aerodynamical Phenomena in Stellar Atmospheres	Nice	September 1965

no.	Subject	Place	Date
29	Instability Phenomena in Galaxies	Bjurakan	May 1966
30	Determinations of Radial Velocities and their Applications	Toronto	June 1966
31	Radio Astronomy and the Galactic System	Noordwijk	September 1966

Symposia nos. 23, 24, 25, and 26 had been held shortly before the twelfth General Assembly of the IAU. Symposium no. 28 was organized in co-operation with the International Union of Theoretical and Applied Mechanics (IUTAM), Symposium no. 31 in co-operation with the International Union of Scientific Radio (URSI).

Symposium no. 32, organized jointly with IUGG, will be held in Stresa, Italy, from 21 to 25 March 1967, and is to deal with 'Continental Drift, Secular Motion of the Pole, and Rotation of the Earth'.

Symposia nos. 33, 34, 35, on 'Physics and Dynamics of Meteors', 'Planetary Nebulae' and 'The Structure and Development of Solar Active Regions' respectively, will be held in Tatranska Lomnica, Czechoslovakia (nos. 33 and 34), and in Budapest, Hungary (no. 35).

#### *Symposia with IAU participation*

The History of Astronomy (IUPHS-IAU), Hamburg, August 1964.

The Trajectories of Artificial Celestial Bodies as Determined from Observations (IUTAM-COSPAR-IAU), Paris, April 1965.

Planetary Atmospheres and Surfaces as Deduced from Radio Observations (URSI-IAU), Dorado Beach, Puerto-Rico, U.S.A., May 1965.

COSPAR Sixth International Space Symposium (sessions on Galactic and Extragalactic Phenomena and Space Research) (COSPAR-IAU), Buenos-Aires, May 1966.

Solar-Terrestrial Physics (URSI-IUGG-IAGA-IAU), Belgrade, August 1966.

Moreover, the IAU was represented at numerous Symposia and at Assemblies of many ICSU Organizations; such representations were announced in the *IAU Information Bulletins*.

#### *Relations to Other Organizations*

##### *IAU Representation*

1. *International Council of Scientific Unions.* The General Secretary (then D. H. Sadler) represented the Union at the second meeting of the ICSU Executive Committee in London (June 1964). The General Secretary represented the Union at the third meeting of the ICSU Executive Committee in Munich, April 1965. The President and the General Secretary represented the Union at the eleventh General Assembly of ICSU in Bombay (January 1966). The General Secretary represented the Union at the fourth and fifth meetings of the ICSU Executive Committee (Bombay, January 1966). The Assistant General Secretary also attended the eleventh General Assembly of ICSU. The General Secretary represented the Union at the sixth meeting of the ICSU Executive Committee, in Monaco, September 1966.

The General Secretary is the present representative of the Union on the Executive Committee of ICSU.

2. *ICSU Organizations.* The Union participates in the activity of a number of Special and Scientific Committees, Inter-Union Commissions and Commissions established and sponsored by ICSU. Particulars of these organizations are given on pages 13 onwards of Volume XII C of the *Transactions*.

The following list gives only the present state of IAU representation in these organizations:

- (a) Committee on Space Research (COSPAR): L. Gratton.
- (b) Special Committee for the International Years of the Quiet Sun (IQSY): G. Righini (Vice-President); R. Michard (reporter for 'Solar Activity').
- (c) Comité International de Géophysique (CIG): G. Righini (Vice-President); R. Michard.
- (d) Federation of Astronomical and Geophysical Services (FAGS): D. H. Sadler (Vice-President); B. Guinot.
- (e) Inter-Union Commission on Frequency Allocations for Radioastronomy and Space Science (IUCAF): J.-F. Denisse; V. A. Sanamian; F. G. Smith (Chairman); A. Unsöld.
- (f) Inter-Union Commission on Solar-Terrestrial Physics (IUCSTP): Z. Svestka.
- (g) Inter-Union Commission on Spectroscopy: B. Edlén; G. Herzberg; J. G. Phillips; M. J. Seaton.
- (h) Inter-Union Commission on Science Teaching (CIES-IUCST): E. Schatzman.
- (i) ICSU Abstracting Board (IAB): J. Kleczek.
- (j) Committee for Data on Science and Technology (CODATA): Ch. Moore-Sitterly.

3. *Other Organizations.* The Union is represented on the following Organizations:

- (a) La Fondation Internationale du Pic-du-Midi, by A. Lallemand.
- (b) Le Comité Consultatif pour la Définition de la Seconde (CCDS) du Bureau International des Poids et Mesures, by W. Markowitz and N. Stoyko.
- (c) Le Comité Consultatif pour la Définition du Mètre du Bureau International des Poids et Mesures, by Ch. Moore-Sitterly.
- (d) Various Services of FAGS, that is on the directing boards of:
  - Bureau International de l'Heure (BIH), by H. M. Smith, N. N. Pavlov.
  - International Polar Motion Service, by the Organizing Committee of IAU Commission 19.
  - Quarterly Bulletin of Solar Activity, by the Organizing Committee of IAU Commission 12.
  - International Ursigrams and World Days Service (IUWDS), by R. Michard.
  - Solar Particles and Radiations Monitoring Organization (SPARMO), by C. de Jager.

*Note:* The Inter-Union Commission on Solar and Terrestrial Relationships (IUCSTR), and that on the Ionosphere (IUCI), have terminated their activities. The IAU was represented by C. W. Allen (President), R. Giovanelli, E. Mustel and M. Waldmeier on the former, and by C. W. Allen (Secretary), R. N. Bracewell, V. G. Fesenkov, K. O. Kiepenheuer on the latter.

#### *Direct Relations with UNESCO*

The Union had the benefit of various direct contracts with UNESCO, as indicated in the financial report.

The first contract provided for a grant towards two IAU Symposia (nos. 23 and 25), whose subjects were sufficiently broad to justify UNESCO assistance.

The second contract provided for regular financial assistance to Commission 38, partly to cover the Commission's expenditure especially in connection with the exchange of astronomers from or to developing countries.

Finally, an *ad hoc* working group of experts organized by Commission 46 of the IAU, agreed on the organization of an annual 'School of Young Astronomers'. A UNESCO grant provided for this purpose in 1966 could not be fully used owing to the short time available

for the preparation of the curriculum. A substitute contract allowed the Union to allocate a scholarship to a student from a developing country towards his studies at a well equipped Observatory. The first UNESCO-IAU Summer School will open in Manchester, in 1967, under the direction of Professor Z. Kopal. The General Secretary of the school is Dr J. Kleczek.

This proposal was studied in great detail by the Executive Committee. The Committee would certainly have preferred that UNESCO, if it had been possible, should have assisted the normal activities of the Union, which have become rather burdensome. Other colleagues believe that a summer school is only justified as a pre-selection agent which would single out the most promising students for a longer stay at well-equipped observatories.

Be it as it may, the results of the experiment will be carefully examined with regard to future policy.

The IAU desires to maintain such contracts with UNESCO, to their mutual benefit. The present possibilities are likely to be fruitful, and the Union wishes to express its thanks and appreciation to UNESCO.

#### *Relations with ICSU and its organisms*

The ICSU is the organization on which the Union is most directly dependent: it transmits to the Union the UNESCO subvention (direct contracts not included) and co-ordinates the activity of Inter-Union Organizations.

This help is valuable and necessary to the Union.

Unfortunately the number of Unions within the ICSU increases, while the UNESCO subvention to ICSU remains essentially unchanged: thus the portion of the UNESCO subvention to the IAU is not likely to increase.

The Union is responsible for travel grants for its representatives on the increasing number of Inter-Union bodies whose meetings are very frequent and held at places often very remote.

While continuing to support the development of inter-disciplinary co-operation, the Union has therefore advocated efforts directed towards regrouping and greater efficiency. This was the Union's attitude in the re-organization of the Committees concerned with the physics of solar-terrestrial relationships; leading to the discontinuation of the IUCSTR and IUCI, the imminent termination of the activities of CIG and IQSY, and the formation of IUCSTP, whose principal objective will be the co-ordination of various activities. This recent action of the IAU is certain to contribute to a better inter-disciplinary co-operation in a domain of fundamental importance.

The Executive Committee of the IAU, in its effort to strengthen the position of the Unions, opposed the development of independent national committees to deal with inter-disciplinary problems, as it is desired that national structures should conform to the inter-disciplinary character of international structures.

The IAU participated with numerous Unions (IUTAM, IUGG, URSI) and Committees (COSPAR, IQSY) in the organization of Symposia (see above, page xxi).

#### GENERAL CONCLUSIONS

The three years covered by the present report were difficult in many respects.

It is certain, on the one hand, that the Members of the Union, and among them especially the Presidents of Commissions, Vice-Presidents, members of Organizing Committees of Commissions, members responsible for the organization of Symposia and Colloquia, and of numerous Special Services, representatives of the Union in different organizations, etc. have achieved admirable results.

The Administrative Office of the Union, always anxious to keep within the narrow limits

of the IAU budget, did its utmost to help Members in these efforts and thus to contribute to the promotion of the interests of Astronomy all the world over. In this respect attempts were made to simplify certain administrative procedures, whilst maintaining the high standard of the IAU publications.

On the other hand, however, there is nothing perfect in this best of all worlds: the new IAU publication policy, adopted with the legitimate desire to improve the quality and distribution of IAU publications, is expensive. Moreover, its application, which calls for a narrow contact between the General Secretary in France, and the printers and publishers in the United Kingdom, met with difficulties in practice which were aggravated by a minor temporary crisis in the organization at the printers and by the change in the person of the IAU Assistant Secretary in 1966; the publications have been slow to come out of the press and their distribution has met with difficulties. This, naturally, puts a strain on the relations between Administration and Members. Moreover, the sales have, so far, been unsatisfactory.

In this connection, it should be emphasized that these relations with Members are based on a rather biased tradition. The IAU is one of the few international organizations having individual members. Members of the Union pay no contribution and no fees; yet, steadily increasing in number, they obtain, free of charge, publications ever ampler in volume; and they have the benefit of the numerous services organized and financed by the Union, and of the scientific contacts the Union facilitates.

Moreover, the contributions of Adhering Organizations are modest compared with the sums their countries spend on Astronomy in their own countries, especially in this age of the rapidly-developing Radio-Astronomical and Space Sciences.

The highest single annual national contribution is equal to only five times the return fare between North America and Europe, and corresponds to the cost of printing and distributing two issues of the *Information Bulletin*, which is also equal to the IAU contribution to the costs of a single Symposium!

There are only two possible solutions.

An attempt may be made to introduce more financial justice by relaxing the generous tradition of the Union and having Members pay a contribution; IAU publications being sold to Members and not distributed free of charge (this measure is already being put into operation); observatories assisting the Union by financing part of the Specific Projects of the Commissions.

Or, if a certain liberality is to be maintained, especially as regards membership and Specific Projects, the Adhering Organizations must agree to accept an increase in the contributions that they pay (see below, Appendix I, page xli).

The Executive Committee is convinced that there is no other alternative, and that the traditional generosity of the IAU budgets is obsolete. Moreover, it is certain that the growing 'gigantism' of the Union will soon have to give way to a new structure. It will be the task of the future Executive Committee to work towards this change.