

TRANSACTIONS OF THE  
INTERNATIONAL ASTRONOMICAL  
UNION

VOL. XVIIIA (REPORTS 1979)

PART 1

**REPORTS ON  
ASTRONOMY**



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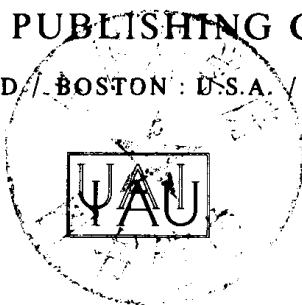
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OF THE  
INTERNATIONAL ASTRONOMICAL UNION  
VOLUME XVIIIA - PART 1

# REPORTS ON ASTRONOMY

*Edited by*  
EDITH A. MÜLLER  
*General Secretary of the Union*



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TRANSACTIONS  
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VOLUME XVIIIA - PART 1  
REPORTS

## PREFACE

Three years ago the Reports on Astronomy were for the first time published in three separate parts whereby related astronomical topics were collected in one volume and each volume was kept to a size of no more than about 250 pages. The aim was to facilitate a wider distribution of individual volumes among astronomers and other scientists interested in specific subjects of astronomy.

The same system was adopted for the present volume A of the IAU Transactions which covers the activities in astronomical research from January 1976 to December 1978. The Commission Presidents were invited to restrict their reports, to present a selection of the most important developments in the field of astronomy covered by their Commission, and to avoid overlaps with other Commission reports. As a result of the restriction in the number of pages some Commissions present a large, concentrated list of references with little discussion, whereas others review some of the most exciting recent research developments in their subject.

The distribution of the Commission Reports into the three parts of volume XVII A is as follows:

### VOL. XVII A - PART 1

*See the Contents for this volume, p. vii*

### VOL. XVII A - PART 2

Commission	8.	Positional Astronomy
"	10.	Solar Activity
"	12.	Radiation and Structure of the Solar Atmosphere
"	24.	Photographic Astrometry
"	25.	Stellar Photometry and Polarimetry
"	26.	Double Stars
"	27.	Variable Stars
"	29.	Stellar Spectra
"	30.	Radial Velocities
"	35.	Stellar Constitution
"	36.	Theory of Stellar Atmospheres
"	42.	Close Binary Stars
"	45.	Spectral Classifications and Multi-band Colour Indices

### VOL. XVII A - PART 3

Commission	28.	Galaxies
"	33.	Structure and Dynamics of the Galactic System
"	34.	Interstellar Matter and Planetary Nebulae

## PREFACE

Commission	37.	Star Clusters and Associations
"	40.	Radio Astronomy
"	44.	Astronomical Observations from outside the Terrestrial Atmosphere
"	47.	Cosmology
"	48.	High Energy Astrophysics

In order to minimize the price of each volume the method of offset printing was used which required the preparation of the typescripts of the reports ready for photographic reproduction.

On behalf of the IAU I thank all Presidents of Commissions and all Colleagues who contributed to the reports for the wealth of interesting and useful information they have collected and presented in this volume.

Thanks are also due to the Secretaries of the Commission Presidents for their careful preparation of the camera-ready typescripts. My personal thanks go to my secretaries Mme R. Bertschi and Mme R. Läubli for their most valuable editorial help.

EDITH A. MÜLLER  
General Secretary

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#### 4. EPHEMERIDES (ÉPHÉMÉRIDES)

PRESIDENT: V. K. Abalakin.

VICE-PRESIDENT: A. M. Sinzi.

ORGANIZING COMMITTEE: R. L. Duncombe, T. Lederle, J. H. Lieske,  
B. Morando, A. Orte, P. K. Seidelmann, G. A. Wilkins.

#### INTRODUCTION

This Report is compiled by using the reports of the Directors of the national ephemeris offices reviewing the programs for the preparation and publication of astronomical ephemerides of various purposes, i.e. for astronomers and space scientists, marine and air navigators, and surveyors. Some proposals of Commission members are also included. The Report may be of interest also to other I.A.U. Commissions, and mainly to Commissions 7, 8 and 31. Principal topics belonging to the Commission competence and some items to be presented to the XVIIth General Assembly of the I.A.U. in Montreal will be reviewed in following comments.

Before proceeding it is fitting to pay tribute to the memory of Dr Edgar W. Woolard who passed away 17 June 1978. His scientific activities were fruitfully associated for many years with Commissions 4 and 41.

#### COMMISSION 4 WORKING GROUP ON NUTATION

In accordance with resolutions adopted at the I.A.U. Symposium No. 78 (Kiev, May 1977) the Working Group on Nutation was established to give a proper consideration to the subject. The Chairman of the Working Group is Dr P. K. Seidelmann. The results of the exchange of opinions and ideas among the members of the W. G. and several advisers were incorporated by Dr Seidelmann in the Draft Report of the W. G.

The final recommendations of the Working Group on Nutation will be made available to all I.A.U. members prior to the XVIIth General Assembly and will be discussed at a joint meeting of Commissions 4, 7, 8 and 31. Moreover, the I.A.U. Joint Working Group on Cartographic Coordinates and Rotational Elements of Planets and Satellites has been established by Commissions 4 and 16. The Chairman of the Joint Working Group is Dr Merton E. Davies.

#### INTERNATIONAL MEETINGS OF INTEREST TO THE COMMISSION

The following international scientific meetings have taken place between the XVIth and XVIIth I.A.U. General Assemblies:

- (i) The I.A.U. Colloquium No. 41 "Dynamics of Planets and Satellites and Theories of their Motion" (Cambridge, U. K., August 1976);
- (ii) The I.A.U. Symposium No. 81 "Dynamics of the Solar System: Theory and Application" in honour of Prof. Dr Yusuke Hagihara (Tokyo, May, 1978);
- (iii) The I.A.U. Symposium No. 82 "Time and the Earth's Rotation" (Cadiz, May 1978);
- (iv) The U. S. Naval Observatory Symposium "Star Catalogues, Positional Astronomy and Celestial Mechanics" in honour of Professor Paul Herget (Washington, D. C., November 1978).



## MATTERS FOR DISCUSSION IN MONTREAL

Following items are proposed to be included into the Agenda of the Commission 4 meetings (either alone or with other Commissions) during the XVIIth I.A.U. General Assembly:

- (i) On the status of work on the FK5 (Dr W. Fricke);
- (ii) Dr D. H. Sadler's proposal to re-consider the Resolution No. 1 (Nomenclature for Time-scales) adopted at the joint meeting of Commissions 4 and 31 in Grenoble on 30 August 1976;
- (iii) Dr A. Orte's statement concerning the inadequacy of the present definition of Universal Time and the necessity of its clarification in the future (to be discussed jointly with Commission 31).

## PUBLICATION OF INTERNATIONAL AND NATIONAL EPHEMERIDES

The Nautical Almanac Offices of the Royal Greenwich Observatory and the U. S. Naval Observatory have continued to produce jointly the three unified publications: The American Ephemeris and Nautical Almanac/The Astronomical Ephemeris, The Nautical Almanac, and The Air Almanac.

The 1981 edition of the American Ephemeris/The Astronomical Ephemeris will be revised in both content and arrangement, the Astronomical Phenomena and Planetary and Lunar Coordinates also will be joint publications satisfying the requirements for advanced data. Dr Wilkins informs: "It is unlikely that the volume of the Astronomical Ephemeris for 1981 will be published by the beginning of 1980, as had hoped; it will be printed only by the U. S. Government Printing Office, but it will also be published by H.M.N.A.O. under the new common title: The Astronomical Almanac". Copies of Planetary and Lunar Coordinates 1980 - 1984 have been distributed by H.M.N.A.O. quite widely to organisations preparing local almanacs.

During the period under review three volumes of The Astronomičeskij Ežegodnik SSSR (the Astronomical Year-Book of the U.S.S.R.) for the years 1979-1981 have been produced in the Institute for Theoretical Astronomy, Leningrad, U.S.S.R., on the generally adopted theoretical basis, the volume for 1982 being in press. The Appendices to these volumes contain the ephemerides of the four ancient (Galilean) satellites of Jupiter for 1978-1980 as prepared in, and received from, the Bureau des Longitudes, Paris, France. The regular publication of the ephemeride of the lunar crater Mösting A has been continued.

Dr Morando writes: "Le Bureau des Longitudes a publié en 1976, 1977 et 1978 la Connaissance des Temps pour 1977, 1978, 1979 respectivement sous sa forme habituelle... En 1977 le Bureau des Longitudes a édité par ses propres moyens un ouvrage d'un type nouveau appelé Connaissance des Temps, nouvelle série, éphémérides astronomiques pour l'an 1978. Cet ouvrage contient les coefficients des développements en polynômes de Tchebychov des coordonnées du Soleil, de la Lune, des planètes et des satellites galiléens de Jupiter".

The Japanese Ephemeris, the Nautical Almanac, the Abridged Nautical Almanac and the Polaris Almanac for Azimuth Surveying have continued to be published by the Hydrographic Department of Japan, Tokyo, for the years 1977, 1978 and 1979, respectively. Dr. Sinzi informs: "It is scheduled that (1) the Japanese Ephemeris from the volumes of 1980 onwards contains the fundamental ephemerides of the Sun, Moon and planets

computed at the Department, being rigorously based on the respective basic data on which the Astronomical Ephemeris is based, and (ii) the Japanese Ephemeris for the year 1980 also contains the predictions of the solar eclipses in 1981-1985 as a supplement. The volumes for 1981, 1982 and 1983 will contain similar data for 1986-1990, 1991-1995 and 1996-2000, successively.

A new publication, the Almanac for Computers has been introduced by the U.S.N.A.O. on an experimental basis, starting with the issue for 1977. This volume contains polynomial coefficients which provide the means for computing the positions of the Sun, Moon and planets for any time during the year to the accuracy desired and includes star positions and coefficients in order to provide mean or apparent places to different levels of accuracy.

Dr Orte communicates from the Instituto y Observatorio de Marina at San Fernando (Cadiz), Spain,: "The Efemérides Astronómicas and the Almanaque Nautico continue to regularly be published... After a public survey among actual and potential users of the Almanaque Aeronautico it was decided to discontinue this publication after the 1976 issue, supplementary tables to the Almanaque Nautico permitting its use also to air navigators".

According to information from Dr A. Bandyopadhyay, the Nautical Almanac Unit of Regional Meteorological Centre, Calcutta, India, has published three volumes of the Indian Astronomical Ephemeris for the years 1977, 1978 and 1979. They contain basic astronomical data as required for India as well as the ending moments of tithis, nakshatras, yogas, etc.

In addition, two other publications have been issued annually to meet public requirements for certain astronomical information:  
(i) Tables of Sunrise, Sunset and Moonrise, Moonset, (ii) Rashtriya Panchang (in English and eleven Indian languages) giving data required for the Indian Calendar.

As Dr Fricke reports the computation and publication of Apparent Places of Fundamental Stars (APFS, in annual volumes) has been continued at the Astronomisches Rechen-Institut at Heidelberg, F.R. Germany. The edition for the year 1980 (now in print) will be the last of 25 volumes (4 produced at Herstmonceux and 21 at Heidelberg) which have been prepared on a card-controlled typewriter. As from the 1981 edition onwards the data will be transcribed on a magnetic tape from which the volume will be printed automatically by a photo-composing method.

Progress has been made in the work on the FK5. Most of the observations which have become available after the completion of the FK4 have been taken on magnetic tape and are ready for the determination of systematic differences against the FK4. The U.S. Naval Observatory, Washington, D.C., and the Center de Données Stellaires at Strasbourg have contributed efficiently to this task.

The work on the determination of equinox and equator of the FK5 has resulted in new findings on the origin of the non-precessional motion of the equinox of the FK4; reference is made to a report given by Dr Fricke (in press: Proc. I.A.U. Symp. No. 81).

Attention is drawn to published work related to the I.A.U. (1976) System of Astronomical Constants and to the FK5. Lieske, Lederle,

Fricke and Morando (19.043.006) have developed the expressions for the precessional quantities based upon the I.A.U. (1978) System, and Fricke (19.043.007) has presented the basic material on which the new value of the luni-solar precession is based and has outlined the arguments in favour of the change of the constant of precession (19.043.002). Lederle (Bull. CDS, No. 14) has computed tables giving information on the accuracy of the FK4 data at different epochs.

#### OTHER PUBLICATIONS

The fourth impression of the Explanatory Supplement to the A. E. was published by the Nautical Almanac Offices of the R.G.O. and the U.S.N.O. in 1977 with some amendments and additions.

The H.M. Nautical Almanac Office has continued to publish The Star Almanac for Land Surveyors and has included in it new tabulations of polynomial coefficients for the calculation of sidereal time and the solar ephemeris.

The preparation of the Bureau of Land Management Ephemeris for land surveyors has been continued by the U.S.N.A.O.

The epoch 1980 edition of Publication No. 249, volume 1, Sight Reduction Tables for Air Navigation, was calculated and prepared by the Defense Mapping Agency Hydrographic Center, U.S.A.

The navigational almanacs have been produced as before by the I.T.A., Leningrad, the Marine Almanac being published for 1978-1980, and the Air Almanac for 1977-1979.

Circumstances of solar eclipses in 1976, 1977 and 1979 with arguments in UT have been prepared in the U.S.N.A.O. and published in the U.S.N.O. Circulars.

The Altitude and Azimuth Almanac for the Antarctic Observation and the Abstract from the Japanese Ephemeris have been compiled annually at the request of the Defence Agency of Japan by the Hydrographic Department, Tokyo.

Le Bureau des Longitudes a publié les Éphémérides Nautiques pour 1977, 1978 et 1979 et l'Annuaire du Bureau des Longitudes pour ces mêmes années. Il contrôle également la publication des Éphémérides Aéronautiques.

The Air Almanac for 1977 was published for the first time in India in October 1976 on the basis of the data supplied by the H.M.N.A.O., the volumes for 1978 and 1979 having been published.

#### PLANETARY, LUNAR, AND SATELLITE RESEARCH

At the U.S. Nautical Almanac Office derivation of trigonometric expressions for the geocentric and heliocentric positions of the Sun, Moon and planets to one minute of arc precision and valid for hundreds of years has been completed.

Planetary observations are being collected and reduced to the FK4 system for comparison with new planetary ephemerides.

The Chebyshev polynomials are applied to the preparation of planetary ephemerides as well as to construction of very accurate plane-

tary theories at the U.S.N.A.O., Bureau des Longitudes, I.T.A.

As a joint work of the Tokyo Astronomical Observatory and the Hydrographic Department of Japan Newcomb's Tables of the Sun and those of inner planets have been reconstructed rigorously to investigate character of figures tabulated in these Tables as well as the actual ephemeris data printed in the Astronomical Ephemeris.

A first-order theory of the motion of Mars has been constructed at the Tokyo Astronomical Observatory and is found to be in a good agreement with the theory of Mars by G. M. Clemence. Calculations of second-order perturbations are being undertaken. The plan to construct theories for other inner planets is under way.

A new analytical theory of motion of the four inner planets designated as AT-1 has been constructed at I.T.A., Leningrad, being fitted to radar measurements of Venus made in 1962-1975 and to positional observations.

The regular distribution of the predictions of occultations of stars by the Moon has been continued by the Nautical Almanac Offices of R.G.O. and U.S.N.O. The H.M.N.A.O. has received and processed about 9000 timings of occultations of stars each year during the review period. Magnetic tapes containing 108 000 observations made in 1943-1978 are available, the data for 1943-1971 being published on microfiche in R. Greenwich Obs. Bull. No. 183.

Lunar occultation data from 1920-1943, prepared at the U.S.N.A.O., have been combined with data from 1860-1920 and 1943-1977, prepared at the R.G.O., and 1627-1860, prepared at the U.S. Defense Mapping Agency. The reduction of the data is completed at the U.S.N.A.O. and analysis is in progress.

Observations of occultations of stars made in 1861-1942 have been collected at the H.M.N.A.O. in a joint project with U.S.N.O. and analysed for variations in the rotation of the Earth.

Based on about 40 observational catalogues north of  $-4^{\circ}$  declination a new Zodiacal catalog which is in the FK4 system has been prepared at the U.S.N.A.O. for reduction and analysis of lunar occultation timings. Preliminary results have yielded solutions with greatly improved accuracy for the equinox, obliquity, and equator, and an improved table of  $\Delta T$  values.

Dr D. W. Dunham, President, International Occultation Timing Association, writes: "I have modified computer programs and machine-readable planetary data supplied by the U.S.N.O. to compute accurate astrometric and apparent ephemerides for over 160 minor planets at daily intervals from 1978 to 2000... The astrometric (equinox 1950.0) ephemerides have been supplied on magnetic tapes to Royal Greenwich and Lowell observatories which have used them mainly for work with occultations of stars by minor planets... A system of computer programs has been developed by Dr T. C. Van Flandern and myself to use the apparent ephemerides to find and compute all possible observable Lunar occultations of minor planets. Accurate osculating elements of orbits for my work have been supplied by the I.T.A., Leningrad, and Cincinnati Observatory".

The search for, and detailed prediction of, occultations of stars

by major and minor planets and by satellites has continued at H.M.N.A.O.

Dr Sinzi reports: "For the purpose of establishing the relation between ET and TAI observations of occultations of stars by the Moon are made at the Hydrographic Department of Japan as routine. About 1000 timing data including 600 photoelectric data have been obtained every year. The value of  $\Delta T$  in the future is thus estimated taking the tendency of UT1 - TAI as announced by the B.I.H. into account".

Dr Morando writes: "Le Bureau des Longitudes a programmé, à partir des théories existantes, les éphémérides des satellites naturels des planètes dans le but d'une collaboration internationale éventuelle. Il effectue également de nombreuses recherches en Mécanique Céleste pour améliorer les théories des planètes et de la Lune dans le but d'augmenter la précision des éphémérides. Enfin les perfectionnements qu'il a apporté à la théorie de Sampson lui permettent de publier les coordonnées différentielles des satellites galiléens de Jupiter sous forme de polynômes de Tchebychov avec une erreur maximum de 0.01".

The 100th anniversary of the discovery of the satellites of Mars was commemorated by a scientific symposium at the U.S.N.O. in 1977. The relevant papers on satellites will appear in Vistas in Astronomy.

Photographic plates of the Martian moons, Galilean satellites, Jupiter V, and the seven brightest satellites of Saturn were obtained by Dr D. Pascu at U.S.N.O. The observations of the Galilean satellites have been used by Dr J.H. Lieske for improving the ephemerides of these satellites for the Voyager mission.

The work on the improvement of the orbits of the satellites of Saturn and Mars has been done at the H.M.N.A.O. and I.T.A., Leningrad.

Dr Bandyopadhyay informs that a project on "Determination of some astronomical constants by ancient Indian astronomers" based on old Indian scripts in Sanskrit has already been completed.

Special predictions have been issued by the H.M.N.A.O. for lunar occultations of radio, X-ray,  $\gamma$ -ray and infrared sources. An accurate position for GX9+1 has been derived from lunar occultations in collaboration with Mullard Space Science Laboratory, U.K.

A number of institutions are engaged in the laser lunar ranging experiments with the goal of scientific applications of results.

#### CONCLUSIONS

We still are deeply involved in the problem of changes in the foundations of the ephemeris work that comprise planetary theories, the system of astronomical constants, time and the Earth's rotation dynamics, and even practical aspects of future ephemeris publication. The progress that is made since the XVIth General Assembly gives us the hope on successful completion of this task well before the end of the twentieth century.

V. K. ABALAKIN  
President of the Commission

## 5. DOCUMENTATION

(Committee of the Executive Committee)

PRESIDENT : J.-C. Pecker.

VICE-PRESIDENT : W.D. Heintz.

ORGANIZING COMMITTEE : D.A.Kemp, J.Kleczeck, P.Lantos, J.R.Shakeshaft,  
T.S.Shcherbina-Samojlova, G.A.Wilkins. ex officio : J.Sahade.

Les activités de la Commission se classent en trois rubriques principales, autour des trois groupes de travail.

I. EDITORIAL POLICY (Working Group; chairman: J.R.Shakeshaft).

### 1. Proliferation of journals.

A la requête de J.Sahade, Président du POGSI, les membres de la Commission 5 ont donné des avis sur ce problème. Quelques extraits significatifs des suggestions relatives aux solutions possibles :

- Instead of subscribing to all journals of interest to someone, one could periodically (every week) receive a listing and abstract of all astronomical papers published in that period (Dixon).

- One should suppress commercial journals; criticisms can be directed against the monopoly enjoyed by the IAU's publisher, and against the IAU policy in this matter (Griffin).

- But the multiplicity of journals is a safeguard to the freedom of actions of individuals (McNally).

- Peut-être serait-il suffisant de déposer les manuscrits dans un centre international approprié, et de ne publier qu'un résumé de 3 ou 4 pages; dans des revues de vaste profil, on ne publierait que les plus intéressants de ces résumés (Mikhaïlov).

- There is almost an inverse correlation between the price charged ... and the standard of work : the IAU members should be more stringent in their refereeing procedures... and reduce the length of second-rate papers (Mitton).

### 2. Style of references in journals and publications.

The Commission should try to reach an agreement from all major journals on a uniform style of reference (Mitton, de Vaucouleurs). The Commission should also improve the IAU Style Book on this matter (Osterbrock).

### 3. Publication in microfiche.

This system is starting to spread (cf. Ap.J. and Memories of the RAS). One should discuss the possibility of microfiche publication of all major journals; and one should seriously consider the production of synopsis journals: it could make the problem of data storage and retrieval very much easier (McNally).

### 4. Tables published in journals.

A legible reproduction should always be ensured; lists of data are of a permanent value to astronomy and should be handled with special care (Worley).

II. ASTRONOMICAL DATA (Working Group; chairman: G.A.Wilkins).

1. The chairman of the WG reports as follows : " The Working Group on Numerical Data was renamed the Working Group on Astronomical Data and was reconstituted with an organising committee and three subgroups at the IAU General Assembly in 1976. (Trans. IAU. 16B, 70-71). It is expected that these subgroups (on "Computer tech-

nology and standards", "Designation of astronomical objects", and "Presentation of astronomical data") will report to the main group during 1979.

The proceedings of IAU Colloquium No.35 on the "Compilation, critical evaluation and distribution of stellar data", which was held at Strasbourg, France, on 1976 August 19-21, were published by Reidel in 1977 (ISBN 90-277-0792-8). This volume contains an extensive survey of astronomical data centres and services and a summary report on the papers and discussions, as well as the texts of four review papers and 33 other papers on current and future activities and problems. Although the main interest was centred on stellar data, the survey and much of the other material are relevant to other types of astronomical data.

The Information Bulletin of the Stellar Data Centre at Strasbourg continues to provide an extremely valuable source of information about astronomical data. Again, the contents cover a wider field than the title implies. The list of catalogues available at the Centre includes many entries for non-stellar objects. The Bulletin also includes lists of errata for published catalogues and short papers on work in progress at the participating observatories and elsewhere. The International Information Bureau on Astronomical Ephemerides at the Bureau des Longitudes in Paris has issued a further 21 cards giving information about star catalogues and ephemerides that are now available.

An interesting article by C.Jaschek on "Data growth in astronomy" (Q.Jl.R. astr.Soc., 1978, 19, 269-276) concludes that : "Contrary to the common belief, the growth rates (of data in modern astronomy) vary from one subject to another, and there is generally no exponential growth. A sizable fraction of all newly published data (28 per cent) refers to objects already observed. This shows that a real "bibliographic inaccessibility" problem exists". If this latter conclusion can be justified, then it is clear that improved arrangements for the dissemination of evaluated data (or of information about their availability) could avoid the waste of resources that may be currently incurred by unnecessary duplication of observation, reduction and publication of astronomical data. This matter appears to deserve further consideration by the individual Commissions of the Union as well as by Commission 5.

The data activities of other international organisations are of relevance to astronomy and the following points may be noticed.

The ICSU Committee on Data for Science and Technology (CODATA) has set up a Task Group on Space and Time Dependent Data, and it is hoped that this Group will identify ways in which advances in data-handling techniques made in one field can be made known and applied in other fields more quickly than has been common in the past. M.S. Davis represents the IAU on this Task Group. CODATA is also preparing for publication an updated and expanded version of Jaschek's survey of astronomical data centres and services as one section of its Directory of Data Sources for Science and Technology.

The Federation of Astronomical and Geophysical Services (FAGS) continued to allocate grants made by ICSU and UNESCO in support of the permanent data services of common interest to IAU, IUGG and URSI. One of the IAU delegates, H.Enslin, was appointed Chairman of the Council in 1977. The responsibility for the production of the Quarterly Bulletin on Solar Activity was transferred from Zurich to the Tokyo Astronomical Observatory; the Bulletin has been edited by Professor M.Waldmeier for the past 30 years; the new editor is Dr. F.Moriyama.

All IAU members who wish to take an active interest in the activities of the Working Group should make their interests known to the Chairman and should apply to become members of Commission 5; membership of Commission 5 may be additional to membership of three other Commissions."

2. The two following publications by NASA are also to be noted :

- Directory of Astronomical Data Files.
- HD-SAO-DM Cross Index.

(Two important publications; information can be obtained from J.Mead, Assistant Chief, Laboratory for Astronomy and Solar Physics, National Space Science Data Center, NASA/GSFC code 601.4, Greenbelt, Md 20771 USA, Attn. Request Coordina-

tion, NASA TM 79564).

### III. CLASSIFICATION DECIMALE UNIVERSELLE UDC 52 (groupe de travail; chairman : D.A. Kemp) ET SERVICES ANALYTIQUES ET SIGNALETIQUES.

1. L'édition du "Handbook on UDC 52" n'a encore pu être menée à bien, à la date de ce rapport (D.A. Kemp).

2. On signalera la publication (trilingue) par l'ICSU AB du plan international de classification de la physique, seconde édition, ISSN 0305-9618, 1978; la section 9 concerne la géophysique, l'astronomie et l'astrophysique. Cet ouvrage peut convenir aux physiciens; les astronomes préfèrent l'UDC 52 qui a été conçu différemment et utilise systématiquement le système des "facettes". L'UDC 52 contient de beaucoup plus nombreuses rubriques.

Une coopération plus étroite sur ces questions devrait se poursuivre avec l'ICSU AB (L.Schmadel).

3. L. Schmadel, responsable de la publication de Astronomy and Astrophysics Abstracts, rapporte comme suit : "Astronomy and Astrophysics Abstracts has continued to be published regularly in semi-annual volumes. Since the 1976 Grenoble meeting six volumes (17 to 22) have appeared covering the literature from 1976 to 1978. An Index Volume including a complete Author and Subject Index for the first ten volumes (period 1969 to 1973) has appeared as Nos. 15/16 in 1976. The preparation of our second Index Volume 23/24 (période 1974 to 1978) will be finished late in this year.

An effort has been made in order to increase drastically the size of our Subject Indexes. Astronomy and Astrophysics Abstracts aims to present a comprehensive list of astronomical terms as a first approximation of a thesaurus. This list of key words -or vocabulary- could serve as an aid for authors, editors, and publishers of primary journals. I hope that I will be able to complete a computer printing of a key word list, consisting of some 10,000 to 15,000 terms, until our Montreal meeting. This list will be a corrected and amended conglomerate of the first 21 volumes of AAA".

4. I. Schcherbina-Samojlova, responsable du département d'Astronomie et de Géodésie de VINITI, rapporte comme suit : " (i) VINITI Astronomy and Geodesy Department continued to publish Abstracts Journals (Referativnyi Zhurnal): 51.Astronomy, 62.Space Research and 52.Geodesy and Aerial Surveying. In 1977 the total number of abstracts amounted to 20 000 in the three issues. (ii) Next volumes of state-of-the-art reviews (so called Itogy Nauki) were issued : Serie Astronomy. 1976, 12, Parts 1,2. "Movement of Poles and Earth rotation irregularities". 1977, 13, "Radioastronomy". Serie Space Research. 1976, 8, "Optical systems and receivers of images of optical telescopes". 1977, 9, "Galaxy and extragalaxy astronomy (Astrophysics of high energies)". 1977, 10, "Planets of the Solar system. Mars". (iii) Preparation is begun for publication of Sovjet Astronomy Bibliography for 20 years (1958-1977) in four volumes. V.I,II publication is scheduled - 1980. Now preparation is underway for the Annotating Index of all scientific literature on the Moon and related investigations for 10 years (1968-1977). Printing is planned for 1979. (iv) The new revised UDC schedules 52 Astronomy were published in Russia. In 1978, the preparation of alphabetic-subject index for these tables will be completed. (v) In 1976-1977 the astronomical classification scheme was considerably improved as applied to the subject-heading list of the Abstracts Journals Astronomy and Space Research. (vi) The elaboration of astronomical terminological thesaurus is going on. (vii) Dr. I.S. Shcherbina-Samojlova carried out an analytical comparison of the Sovjet astronomy abstracts journal and Astronomy and Astrophysics Abstracts with view to optimizing of informational support of astronomers. A paper was written. (viii) The following papers were published : I.S.Shcherbina-Samojlova, T.I. Zapolskaya "System of Cross-Reference in the (astronomical) Abstracts Journal" (Bul. Nauchno-tehnicheskaya informatsiya, ser.1, 1978, N 3,24-28); V.T. Federov,



"Ranking of Publications on a Fundamental scientific and technological problem (with reference to radioastronomy)" (Bul. Nauchno-technicheskaya informatsiya, ser. 1, 1978, N 2, 15)."

5. One should also note with interest the activity in the field of documentation of various organisations from which reports have been received :

-Primary Communications Research Centre (at the University of Leicester; Director : Prof. A.J. Meadows).

- International Association of Institutes of Navigation (IAIN). IAIN is preparing an "Annotated Bibliography of Methods and Tables for Astronomical Navigation" (project directed by Captain Charles H. Cotter, Dept. of Maritime Studies, UWIST, King Edward VII Avenue, Cardiff CF1 3NU).

6. On notera avec intérêt les ouvrages suivants :

- Seal, R., 1978, A guide to the literature of astronomy, Libraries unlimited.

- Walsh, J.R., 1977-78, Classification of Astronomy (submitted in partial fulfilment for the degree of M. Sc. (Inf. Sci.), University of Sheffield).

#### IV. DIVERS.

##### 1. Archives d'observatoires.

M. J.O. Fleckenstein écrit : "Les archives des anciens observatoires (Paris, Greenwich, Milan, etc...) ont une valeur inestimable pour l'histoire des sciences. Pour cette raison je propose de discuter à l'occasion de notre assemblée prochaine à Montréal la possibilité de microfilmer les archives des observatoires et de concentrer le matériel international dans un archive central." Ce point est porté à l'ordre du jour des réunions de la Commission 5 à l'Assemblée Générale de Montréal.

On notera les deux publications suivantes :

- Union catalogue of printed books of the XV and XVI centuries in astronomical European Observatories, compiled by G. Grassi, 1977, Oss. Astron. Roma, Contr. Scientif. Série III, n°155.

- J.A. Bennett : Catalogue of the archives and manuscripts of the Royal Astronomical Society (Mem. R. Astron. Soc., 1978, 85, 1-90).

##### 2. Observatoires astronomiques et astronomes.

L'annuaire jadis publié sous les auspices de l'UAI (1959) a vieilli sans appel (Martynov). Le fichier tenu par M. Velghe pourrait-il être régulièrement mis à jour et disponible sur bande magnétique?

##### 3. Nomenclature des objets stellaires, galactiques et extragalactiques.

Une discussion sur ce thème devrait avoir lieu à Montréal. On notera le besoin d'établir un système uniforme de désignation des catalogues d'observations; de désigner de façon non équivoque les différents types d'objets astronomiques; d'assurer l'adoption par les journaux scientifiques de règles permettant l'identification correcte des objets apparaissant dans les publications (C.Jaschek; M.C. Lortet).

#### V. RELATIONS AVEC D'AUTRES ORGANISATIONS.

1. ICSU AB : Le Président de la Commission 5 représente, ex officio, l'UAI à l'ICSU AB. En 1976, W.D. Heintz a représenté l'UAI à la réunion de Philadelphie; en 1977, J.-C. Pecker a représenté l'UAI à York; en 1978, L.Schmadel a représenté l'UAI à Toulon. Parmi les décisions importantes figure la mise sur pied de six groupes de travail définis par des tâches précises, à savoir : "input cooperation; output-repacking; technical resource sharing; research and development activities; user education and training; community concerns. On notera la publication en