

LIST OF ACRONYMS

APP	Atmospheric Physics Program
ASHAY	Antarctic and Southern Hemisphere Aeronomy Year
CCIR	International Radio Consultive Committee
CCITT	International Telegraph and Telephone Consultive Committee
CCOG	Committee for Coordination of Observations Associated with GEOS
CODATA	Committee on Data for Science and Technology
COSPAR	Committee on Space Research
COSTED	Committee on Science and Technology in Developing Countries
ELAS	Electrical Conductivity of the Asthenosphere
FAGS	Federation of Astronomical and Geophysical Services
FBS	Flare Build-up Study
GARP	Global Atmospheric Research Program
GDP	Geodynamics Project
GMP	Geomagnetic Meridian Project
IAC	International Association of Geodesy
IAGA	International Association of Geomagnetism and Aeronomy
IAGC	International Association of Geochemistry and Cosmochemistry
IAHS	International Association of Hydrological Sciences
IAMAP	International Association of Meteorology and Atmospheric Physics
IAPSO	International Association for the Physical Sciences of the Ocean
IASPEI	International Association of Seismology and Physics of the Earth's Interior
IASY	International Years of Active Sun
IAU	International Astronomical Union
IAVCEI	International Association of Volcanology and Chemistry of the Earth's Interior
ICG	Inter-Union Commission on Geodynamics
ICSU	International Council of Scientific Unions
IDECAM	International Decade in the Earth's Crust and Mantle
IGC	International Geological Congress
IGCP	International Geological Correlation Programme
IGRF	International Geomagnetic Reference Field
IGY	International Geophysical Year
IMS	International Magnetospheric Study
IMSCIEO	INS Information Exchange Office
INAG	Ionospheric Network Advisory Group
IQSY	International Years of the Quiet Sun
IRI	International Reference Ionosphere
ISEA	International Symposium on Equatorial Aeronomy
ISGI	International Service of Geomagnetic Indices
ISSP	International Solar System Programme
ITU	International Telecommunication Union
IUCRM	Inter-Union Commission on Radio Meteorology
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUPAP	International Union of Pure and Applied Physics
IUWDS	International URSIGRAM and World Days Service
MAP	Middle Atmosphere Programme
MONSEE	Monitoring of the Sun-Earth Environment
PEDAS	Potentially Environmentally Detrimental Activities in Space
SBARMO	Scientific Ballooning and Radiations Monitoring Organization
SCAR	Scientific Committee on Antarctic Research
SCOPE	Scientific Committee on Problems of the Environment
SCOSTEP	Scientific Committee on Solar-Terrestrial Physics
SERF	Study of Energy Release in Flares
SESAME	Structure and Energetics of the Stratosphere and Mesosphere
SHISG	Southern Hemisphere Ionospheric Studies Group
SIP	Study of Interplanetary Phenomena
SMY	Solar Maximum Year
SSC	Satellite Situation Center
STIP	Study of Travelling Interplanetary Phenomena
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISIST	ICSU-UNESCO Joint Project to Study the Feasibility of a World Information System
UNO	United Nations Organisation
URSI	Union Radio Scientifique Internationale (International Union of Radio Science)
WDC	World Data Centre
WDDC	World Digital Data Centre
WMO	World Meteorological Organisation
WMS	World Magnetic Survey

IN MEMORIAM

Albert Thomas PRICE

Prof. A.T. Price died on 13 December 1978 aged 75. He was Professor Emeritus following his retirement from Exeter University in 1968. In 1962 he was Visiting Investigator at the Carnegie Institute, Washington and, during 1961 and 1962, IGY Research Fellow in the Coast and Geodetic Survey, Washington. For personal reasons he declined the many offers of research appointments abroad after retiring. Early contact with Sydney Chapman influenced his to devote most of his effort from 1928 to research in geomagnetism apart from a period as a government advisor during World War II. The total of his labour has advanced the discipline in a profound way. There is space here to mention only a few major milestones in his study of induction and conductivity of the earth, viz induction in a uniform sphere by aperiodic fields and its application to Sq and Dst (1930, 1931), induction for periodic and aperiodic fields with conductivity varying with radius, leading to profiles with a surface conductor and a steep increase with depth (1939), induction in thin sheets and shells with application to the oceans and the ionosphere (1949), theory of the magnetotelluric method with finite source fields (1962). Much of his work was in collaboration with others. He was not merely a mathematician but was aware of the importance of data and was often involved in their acquisition and interpretation. He was Chairman of Commission IV of IAGA from 1964-1968. His friendliness and kindness combined to make him an easy collaborator, generous with praise, humane in criticism and ever ready with help to students and colleagues.

(B.R. Leaton and B.A. Hobbs)

ULF FAHLESON

The scientific community in the field of magnetospheric research has suffered a tragic loss by the death of Ulf Fahleson, at the earth age of 46, on March 17, 1979.

Ulf Fahleson graduated from the Royal Institute of Technology, Stockholm, in 1958 and worked for a short period at the National Defence Research Establishment. In 1960 he joined the Department of Plasma Physics of the Royal Institute of Technology, where he obtained his Tekn.Lic (equivalent of Ph.D) in 1966 and the (no longer obtainable) degree of Tekn. Dr in 1973. In 1975 a personal position as Associate Professor, and later Professor, of Experimental Space Plasma Physics at the Royal Institute was created for him by the Swedish Board for Space Activities.

In his early years at the Royal Institute, Ulf Fahleson worked on laboratory experiments. One of his results, together with Lars Block, was the experimental discovery of the phenomenon of critical velocity, previously postulated by Hannes Alfvén in his theory of the origin of the planetary system. From about 1965 most of Ulf Fahleson's work was related to the problems of electric fields in space plasmas. In a number of pioneering papers he built a solid theoretical basis for the double-probe method of electric field measurements. The papers brought him international recognition and invitations to participate in foreign rocket programs. This was the beginning of a still continuing fruitful collaboration of the Department of Plasma Physics of the Royal Institute with, in particular; the Space Sciences Laboratory,

University of California and the Space Science Department of ESTEC. Within this collaboration Ulf Fahleson has played a key role in the development of sophisticated methods of electric field measurements now being used in ISEE-1 and GEOS.

Ulf Fahleson's great competence and sound scientific judgement was widely appreciated. He served in advisory committees and working groups in the US as well as in Europe, and at his death he was a member of ESA's Solar System Working Group. Ulf Fahleson has made scientific contributions of lasting importance in his field of research. He will be remembered not only for his scientific contributions but also for his rare personality. His kindness, gentle manner and warm friendship will long be remembered by a wide circle of personal friends in many countries.

(C.-G. Fälthammar)

Yuichiro AONO

Dr. Yuichiro Aono, the former deputy director of the Radio Research Laboratories in Tokyo, passed away on 20 May 1979, at the age of 63, after a long fight against diseases caused by cerebral apoplexy. He was appointed the technical official of the Radio Physics Commission, Ministry of Education (present RRL's antecedent) in 1941, devoting his efforts to the study of the ionosphere and radio wave propagation. He contributed very much to the development of automatic ionospheric sounder and invention of direct monitoring apparatus of the transmitter waveform. His scientific papers cover a variety of subjects such as the world distribution of ionospheric parameters, HF wave propagation, Antarctic research associated with high latitude ionosphere, rocket-borne ion probes, construction of large parabolic antenna for space research and telecommunications, etc. In addition to his scientific contributions, his administrative service is also to be noted. He was an active representative of the ionosphere discipline from the preparatory stage of the International Geophysical Year; he served as a member of Special Committee of World-wide Ionospheric Sounding under URSI as well as an executive member of International Ursigram and World Day Services.

(K. Tao, Director, Radio Res. Labs.)

Yusuke HAGIHARA

Dr. Yusuke Hagihara, Professor emeritus of the University of Tokyo, passed away on 30 January 1979 at the age of 79. He was a world famous astrophysicist because of his great contributions to celestial mechanics, and he was Vice-President of IAU. In addition to his leadership of astronomy in Japan, he also served as the leader of the Ionosphere Research Committee, Science Council of Japan for many years during and after the World War II. The committee contributed greatly to the development of space science in Japan.

(N. Fukushima)

Naoto KAWAI

Prof. Naoto Kawai (Department of Material Physics, Faculty of Engineering Science, Osaka University) passed away on 3 July 1979 at the age of 57. His scientific contribution was mainly to palaeomagnetism and archaeomagnetism, and also high-pressure physics. He first studied geology and then he extended his research with the aid of rock magnetism. He was a member of the previous IAGA Commission III on Magnetism of the Earth's Interior. In recent years his interest was also in the physico-chemical properties of various materials under high pressure, and he constructed a very effective high-pressure instrument based on his own idea of multi-piston method. His work with high pressure equipment contributed very much to the understanding of the transient layer in the earth's mantle. For the IUGG Canberra Assembly he had been asked to serve as a representative from the Inter-Union Commission on Geodynamics to the programme committee of the IUGG Interdisciplinary Symposium No. 11 "Physico-Chemical Properties of Mantle Materials at High Pressure".

(N. Fukushima)

The Secretary General has received the following regrettable notices on the passing away of

Prof. CHEN Zhe-Ming (Institute of Space Physics, Tsien, China)
on 30 May 1979,

Prof. Hugh C. WEBSTER (formerly in the Department of Physics,
University of Queensland, Brisbane, Australia) on 28 December 1979.

INTERNATIONAL SYMPOSIUM ON IMS RESULTS

This was the first major international symposium on the scientific results of IMS (International Magnetospheric Study), which was an ICSU-supported international project during 1976-1979. The symposium was organized jointly with SCOSTEP, and co-sponsored by the Australian Academy of Science, Australian Institute of Physics. The symposium was held during 27 November - 1 December 1979 in Melbourne, as a part of the XVII IUGG General Assembly in Australia. The Local Organizing Committee headed by Prof. K.D. Cole made excellent arrangements. All the scientific sessions were held in the Agora Theatre of La Trobe University, Melbourne.

The total number of attendants was 175 from 25 countries, and 128 papers by 273 authors were scheduled. The scientific sessions were as follows.

Nov. 27	a.m.	Keynote address: "Plasma in Laboratory and Space"
		by H.O.G. Alfven
	"	Session I: Magnetopause and Boundary Layers
	p.m.	Session I: (continuation)
Nov. 28	a.m.	Session II: Aurora, Substorm and Magnetotail
	p.m.	Session II: (continuation)
Nov. 29	a.m.	Session III: Auroral Arcs, Pulsations and Hiss
	p.m.	Session IV: Lower latitude phenomena
	"	Open discussion: Magnetospheric Research in the Eighties
Nov. 30	a.m.	Session V: Electric Fields and Currents
	p.m.	Session V: (continuation)
	"	Session VI: Energetic and Thermal Plasmas
Dec. 1	a.m.	Session VII: Waves in the Magnetosphere

The "Program and Abstracts" booklet of 64 pages was published as IAGA Bulletin No.42, and this is now available at the cost of \$3.00 per copy on request from the IUGG Publications Office (39 ter Rue Gay-Lussac, 75005 Paris, France).

The IMS symposium was very successful in introducing a great number of new findings from the IMS observational period of 1976-1979, and useful discussions were held also on many problems for future research in the analysis phase of IMS.

Remark: Please refer also to pages 72-76 of this IAGA News concerning IMS.

XVII GENERAL ASSEMBLY OF IAGA

SUMMARY

The Seventeenth General Assembly of IAGA was held in the Australian National University in Canberra, Australia, during 3-14 December 1979, in connection with the XVII IUGG General Assembly, with the support of the Australian Academy of Science. The IAGA Secretariat was assisted by Mr. Peter M. McGregor and his colleagues from the Bureau of Mineral Resources, Geology and Geophysics. The IAGA Secretariat was supported also through the efficient work of Mrs. Helga Wilm (secretary to the IAGA President) and Mrs. Suzanne Hill (secretary to the Secretary General until June 1979 and now in Canberra).

The total number of IAGA registrants was 433 from 32 member countries, whereas the total participants in the IUGG General Assembly were some 2000 from 48 member countries. The scientific programs of IAGA were held according to the schedule already announced in the IAGA News No.17 (November 1978) and the Second Circular of the IUGG Assembly (March 1979), with a slight modification of time slot. Some 460 papers were submitted from 723 authors, and these papers were presented at 32 specialized sessions (see page 7). In addition to these ordinary sessions, Divisions I-V held their Reporter Review Sessions. Informal meetings were held for the topics of natural EM noise, ELAS project, digital ionosonde, and World Data Centers. The "Program and Abstracts" booklet of 389 pages was published as IAGA Bulletin No.43, and a limited number of this publication is now available at the cost of \$5.00 from the IUGG Publications Office (39 ter, Rue Gay-Lussac, 75005 Paris, France). National Reports from the following member countries were available to the participants; Czechoslovakia, German Democratic Republic, Federal Republic of Germany, France, Hungary, India, Italy, Turkey, USSR, U.K., and U.S.A.

The administrative matters of the whole IAGA organization were discussed at the two meetings of the "Conference of Delegates" held on 3 and 13 December 1979. The matters for each sub-organization of IAGA, i.e. five IAGA Divisions and four Interdivisional Bodies, were discussed in their own business meetings. All the IAGA internal Working Groups also held their meetings during the conference period.

The important decisions of IAGA at its XVII General Assembly will be seen in the following pages, but a brief summary is given below.

IAGA Statutes and By-Laws: Only one small amendment was made for the IAGA By-Law 16c (see minutes of the Conference of Delegates on 3 December 1979).

IAGA Internal Structure and Membership: No major change was made in the IAGA internal structure, but there were some minor changes in the Working Group and Topic Classifications. The Executive Committee members and leaders of IAGA Divisions and Interdivisional Bodies were changed for the next four-year period. The new internal structure and leaders are given on pages 55-65 in this IAGA News.

Resolutions: At the second Conference of Delegates on 13 December 1979, IAGA adopted 18 Resolutions, including one resolution of thanks. Most of the other resolutions are concerned with the future possible improvement of the observation and research programs in various scientific fields of IAGA. One resolution urging a strong support of basic research was also adopted as an IUGG Resolution. The English and French texts of the whole IAGA Resolutions are included on pages 45-51 of this IAGA News. Some selected IUGG resolutions of the Canberra Assembly are also shown on pages 52-54 for information.

Next IAGA Assembly in 1981: According to the invitation from the U.K. National Committee, the Fourth General Scientific Assembly is now scheduled to be held in Edinburgh, Scotland, U.K., during 3-15 August 1981. (For information, in the summer 1981, IASPEI in Ontario, Canada, 19 July - 2 August; URSI in Washington, D.C., 10 - 19 August; IAMAP in Hamburg, 17 - 30 August.) The U.K. National Committee distributed to all the participants of the IAGA Canberra Assembly a leaflet containing the following words.

The 4th Scientific Assembly is to be held on the campus of Edinburgh University. Edinburgh, capital of Scotland is an ancient city with many places of historic and scientific interest. The 27th Edinburgh International Festival of Art, Music and Drama takes place in the three weeks immediately after the close of the Assembly.

Accommodation will be available in University Halls of Residence (single and double rooms) and in a number of hotels, private hotels and guest houses near the university campus. The cost per person per night for dinner, bed and breakfast in the University or guest house will be approximately £10 with the prices of hotels ranging upwards from this.

P.S. The First Circular of the Edinburgh Assembly is being sent to all the IAGA News recipients along with this IAGA News. All those who are considering participating in the Edinburgh Assembly are asked to send the pre-registration to

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Murchison House, West Mains Road,
Edinburgh, EH9 3LA
Scotland, U.K.

IAGA ORDINARY SCIENTIFIC SESSIONS
of the CANBERRA ASSEMBLY

<u>Session Title</u>	<u>Number of papers submitted</u>
I-1. Mathematical and Physical Aspects of Modelling the Geomagnetic Field and its Secular Variation	18
I-2. Tectonomagnetics	15
I-3. Planetary Dynamo Theory	13
I-4. Lithospheric Mapping from Local Anomaly Charts	6
I-5. Rock Magnetism of Fine Particles	17
I-6. Paleomagnetism of Recent Sediments	14
I-7. Multicomponent Natural Remanent Magnetization	19
I-8. Geological Applications of the Magnetic Anisotropy of Rocks	6
I-9. Correlation between Anomalies of Potential Fields	8
GC-I. General Contributions to Division I.	18
II-1. Dynamics of the Thermosphere and Ionosphere and Effects on Composition	34
II-2. Ionospheric Irregularities	23
II-3. Non-Solar Ionization Sources in Low Latitudes	11
II-4. Thermospheric Photochemistry	14
II-5. Electromagnetic Coupling within the Atmosphere	9
GC-II. General Contributions to Division II	19
III-1. Non-Linear Waves in Geophysical Plasmas	12
III-2. Quantitative Description of Magnetospheric Processes	21
III-3a. Geomagnetic Pulsations: Observational tests of geomagnetic pulsation theories	10
III-3b. Geomagnetic Pulsations: Pulsation generation and propagation theory	12
III-3c. Geomagnetic Pulsations: Substorm associated geomagnetic pulsation	12
III-3d. Geomagnetic Pulsations: Multipoint observations of geomagnetic pulsations	17
GC-III. General Contributions to Division III	25
IV-1. Multipoint Studies of Evolving Solar Wind Structures	9
IV-2. Solar Wind Interaction with Planetary Atmospheres (with Division II)	10
IV-3. Shocks, Discontinuities and Waves in the Solar Wind	14
GC-IV. General Contributions to Division IV	6
V-1. Workshop on Observatory Practice and Reduction of Secular Variation Observations	15
V-2. "Mayaud" Symposium on the Use of Geophysical Indices	16
GC-V. General Contributions to Division V	2
EI-1. Internal Contributions of the Ionospheric Electrojets	20
EI-2. External and Internal Magnetic Variations for Sq, L and Related Phenomena	15
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Total 460	

BUSINESS MEETINGS OF IAGA DIVISIONS AND INTERDIVISIONAL BODIES

The complete reports of IAGA Divisions and Interdivisional Commissions and Working Groups will appear in the Transactions of the IAGA Canberra Assembly. They had their own business meetings during the Canberra Assembly, where the discussions concentrated on

- (i) Change in leadership
- (ii) Improvement of internal structure within its own Division or Interdivisional Body
- (iii) Resolutions to be proposed
- (iv) Scientific topics for the next IAGA Assembly in August 1981
- (v) Guideline for future activity

The readers of this IAGA News will find the final results of discussions on items (i) and (ii) in the "IAGA Internal Organization and Membership (1979-1983)". As to item (iii), the draft resolutions from each IAGA Division and Interdivisional Body were passed to the Resolutions Committee (Chairman: M. Gadsden), and the final resolutions adopted at the second Conference of Delegates on 13 December 1979 are summarized separately in this IAGA News. Although the English version only was drafted in Canberra, the French version is given in this IAGA News prepared by courtesy of Drs. P. Bauer and M. Blanc. For the topics for the Edinburgh Assembly, item (iv), there were a number of proposals in Divisions and Interdivisional Bodies, and it was necessary to give priority within them. The selected topics with high priority are shown in the First Circular of the Edinburgh Assembly, which is being sent along with this IAGA News. The final selection of the topics and schedule for the Edinburgh Assembly will appear in the Second Circular and the next IAGA News.

Each Division and Interdivisional Body leader has kindly submitted to the Secretary General their brief reports for prompt circulation in this IAGA News. However, since the items discussed in Divisions and Interdivisional Bodies are nearly the same and the results of discussions can be seen in this IAGA News, the individual reports from the leaders have not been reproduced here in order to avoid duplication of the information summarized.

It must be mentioned here that the internal structure for some Interdivisional Commissions was deferred at the Canberra Assembly in order to consider a better internal structure, after negotiating also with a number of colleagues within their own commissions, who were unfortunately unable to attend the Canberra Assembly.

It has to be mentioned that all the outgoing leaders, who gave their leadership to their successors, were thanked very much by the participants of the business meetings for their continuous devotion to the development of scientific activity in their own Division or Interdivisional Body.

MINUTES OF THE IAGA CONFERENCE OF DELEGATES

during the XVII IAGA General Assembly
Canberra, Australia

IAGA had two meetings of the Conference of Delegates during the XVII IAGA General Assembly in Canberra, Australia. Delegates from 32 IAGA IUGG member countries attended the Conference of Delegates. The accredited Chief Delegates and their nominated representatives of the member countries were as follows.

<i>Member Country</i>	<i>Chief Delegate (and nominated representatives)</i>
Argentina	D. A. Valencio
Australia	W. D. Parkinson
Belgium	M. Scherer (M. Nicolet)
Canada	D. I. Gough
Chile	J. R. Bannister
China	Q.-L. Liu
Czechoslovakia	V. Bucha
Denmark	K. Lassen
Egypt	A. A. Ashour
Finland	J. Oksman
France	W. L. Chanin (B. Bauer, R. Schlich)
D. R. Germany	W. Mundt
F. R. Germany	P. Fabian
India	P. K. Das
Indonesia	R. Susanto
Italy	F. Mariani
Japan	H. Maeda
Mexico	L. Chargoy E.
Netherlands	D. van Sabben
New Zealand	R. S. Unwin
Nigeria	E. Omi
Norway	A. Egeland
Portugal	H. Fonseca
South Africa	A. D. M. Walker
Spain	J. O. Cardus
Sweden	C.-G. Falthammar
Switzerland	G. Fischer
Turkey	A. M. Isikara
U.S.S.R.	V. V. Migulin

U. K.	B. R. Leaton
U.S.A.	B. A. Tinsley
Zimbabwe-Rhodesia	P. L. McFadden

**I. The First Conference of Delegates on 3 December 1979,
1400-1530 in Melville Hall**

President Roederer called the Conference of Delegates (CD) to order. Secretary Fukushima confirmed that a quorum existed as specified in Statute 19 of the Association (27 Chief Delegates present out of 32 accredited).

The President made a few introductory remarks and pointed out that this was the first meeting of the CD with the XVII General Assembly. This meeting also represents the opening session of the IAGA General Assembly and includes mostly information items plus a few action items on which a discussion and a vote should be called for. The President referred to the following Agenda:

- I. Welcome Address and Remarks from the Organizing Committee
- II. Set up of Ad Hoc Committees for the Canberra Assembly
 - 1) Resolutions Committee
 - 2) Nominating Committee
 - 3) Finance Committee
- III. Report of the Secretary General
- IV. Other Items
- V. Presidential Address.

He informed the CD that under Item IV, "Other Items," the Executive Committee (EC) proposes to include:

- (1) CD concurrence to EC decisions taken at its 1978 meeting in La Londe, in accordance with Statute 6.
- (2) Proposed change in Bylaw 16c.
- (3) Ratification of new Division leadership, as per Bylaw 3.
- (4) Information item: voting procedure for election of the next EC.

Before submitting this amended agenda for adoption, the President asked the CD for further comments. The Chief Delegate from UK presented 3 points for inclusion under Item IV: (1) He suggested on behalf of the British National Committee that the IAGA structure be modified to include again a group dealing with Sq and L variations; (2) A UK scientist has complained to the British National Correspondent about the late notice received concerning a recent international meeting co-sponsored by IAGA, and suggests that some ground rules need to be established to insure that workshops and meetings sponsored by IAGA are of a truly international nature; and (3) the UK delegation feels strongly that a change in Statutes may be desirable to insure that: "With the exception of the election of the Secretary General, no person shall be eligible for election to any position on the IAGA Executive who has served already on the Committee for the proceeding four consecutive periods."

The President responded that point (1) mentioned by the Chief Delegate of the UK should be referred to Divisions II and III since, according to Bylaw Division leaders should deal with a problem of this nature before the EC gives approval. He indicated that point (2) will be

considered in the discussion when CD concurrence is requested concerning the mechanism of IAGA sponsorship of conferences. Concerning point (3), he suggested that the British Committee submit a formal request at least six months before the next IAGA Assembly, as specified in Statute 22.

The amended agenda for the plenary session (an administrative matter) was then approved unanimously by the Chief Delegates.

The President invited Dr. Dudley Parkinson to address the delegates on behalf of the Local Organizing Committee. Dr. Parkinson did so, expressing the appreciation of the Local Organizing committee for the efforts expended by the delegates to attend the General Assembly in this remote location. He specifically thanked Mr. Peter McGregor for his efforts to organize the details of the local IAGA organization. In conclusion, Dr. Parkinson expressed his hope that many would be able to stay after the conference to see and enjoy Australia, and that those who could not would be able to return here some day.

The Secretary General then announced the composition of the following committee:

Resolutions Committee:	M. Gadsden (UK), Chairman
(Appointed by the EC)	P. Bauer (France)
	H. Oya (Japan)
	W. D. Parkinson (Australia)
	O. M. Raspopov (USSR)

Chairman Gadsden addressed the delegates and reminded them to provide the name and address of the organization(s) or person(s) most concerned with each resolution submitted to the Committee. He also requested that resolutions for IUGG be submitted in English and French, while IAGA resolutions need only be submitted in English (the Committee will translate them). He also provided information concerning timing and deadline for resolution submission.

The Secretary General then proceeded with the announcement of the committee:

Nominations Committee:	M. Nicolet (Belgium), Chairman
(Appointed by the President)	J. O. Cardus (Spain)
	V. V. Migulin (USSR)
	R. G. Rastogi (India)
	G. C. Reid (USA) (proxy vote by T. E. VanZandt)

The President commented that the work of the Nominations Committee was to have been completed by correspondence prior to the Assembly; however, this had not been possible. The Committee would prepare the slate of EC nominations without further delay and distribute it to the Chief Delegates before tomorrow evening. Roederer further explained his action when he learned that Dr. Reid would not be able to come to Canberra. Since he did not feel it proper for the President to appoint a new person to replace Dr. Reid on short notice before the meeting, he requested that Dr. Reid designate his alternate and give the latter his proxy vote. Dr. Reid chose Dr. VanZandt (USA).

The Secretary General announced the membership of the third committee:

Finance Committee:	R. G. Johnson (USA), Chairman
(Appointed by the EC)	C. Sucksdorff (Finland)
	H. Maeda (Japan)

The Secretary General presented his report to the delegates, beginning with a request for a

minute of silence in honour of recently deceased members, too numerous to name individually. (See the Secretary General's full report in the IAGA News.)

At the conclusion of the Secretary General's report, the President called for a motion to accept the report, which was made, seconded and approved unanimously. He commented on the tremendously hard work performed by the Secretary General in preparation of this Assembly and all other IAGA business. The delegates enthusiastically applauded the Secretary General's efforts.

The President then proceeded to Item IV on the Agenda:

First point included in this item was the request of the concurrence by the CD of EC decisions taken at La Londe in September 1978. The President informed that there was only one decision that required concurrence, related to the co-sponsorship by IAGA of meetings, workshops, and symposia. The President read from the 1978 EC meeting minutes (IAGA News No. 17, p. 25 bottom): "It was noted that meetings to be cosponsored usually can be divided into three categories: 1. Major meetings requiring financial support from IAGA and with IAGA representation on the organizing committee; 2. Major meetings not requiring financial support, but whose organization still requires IAGA representation; 3. Meetings or Workshops of limited scope or regional nature, to be attended by IAGA scientists. It was agreed that IAGA co-sponsorship rules given at the Borok EC meeting (the conference must be truly international, and a IAGA representative must be appointed to the Organizing Committee during the early stage of planning) apply to 1 and 2 above, while type 3 meeting cosponsorship may be approved by the President. For meetings of category 1 and 2, a 3-4 page report will be requested, to be published in IAGA News. All three types of meetings will be announced in IAGA News. IAGA cosponsorship should be indicated in the programs of the meetings; acknowledgement of IAGA support should be made in a prominent place in case of meetings of category 1."

The President invited the Chief Delegate of the UK to present his case again. After a lengthy discussion, the President assured the CD that the EC will consider the case at its meeting. After this discussion, the President requested a vote of concurrence for the decision concerning cosponsorship (reproduced above between quotes). Approval was unanimous.

The President proceeded to point 2 of IV and explained in detail the change in Bylaw 16c proposed by the EC (see IAGA News No. 17, p. 19). He read both the old text and the proposed text, explaining that the reason for the proposed change was to make a clear distinction between "Local Correspondents" in non-member countries, and the National Bodies of member countries (Statute 4). The designation "corresponding members" of the present text of Bylaw 16c had been judged inappropriate, for it might induce the notion of "membership" in IAGA. Only *countries* are members of IUGG Associations, the President said. The vote was taken and the change in Bylaw 16c was approved (with one abstention) to read: "c) invite persons or institutions belonging to countries which are not members of the Association, to be local correspondents to ^{the} ~~the~~ Association."

The President proceeded to point 3 of IV, concerning the new leadership of the Division and Commissions. He reminded the CD that the Association believes in change and that the new leadership should be made up of scientists of high reputation and be known for their quick response to correspondence. He also pointed out that according to Bylaw 5, appointments should be made with due respect to adequate geographic distribution. Vice-President Cole displayed the slate of candidates on the blackboard [Note: Since the names of the new

leadership of IAGA Divisions and Interdivisional Bodies are shown elsewhere in this publication, the listing is omitted here. The names shown in this first CD were, Division I (chairmen and one vice-chairman), Division II (chairman and for three co-chairmen), Division III (chairman and three co-chairman), Division IV (chairman and two co-chairmen), and Division V (chairman only). The remaining leaders were proposed during the assembly and shown in the second CD on 13 December.]

The President commented that the slate of candidates had been approved by the EC earlier and was placed before the Delegates for their ratification in accordance with Bylaw 5. The slate of candidates was approved unanimously by the Chief Delegates as an administrative matter.

The President turned to point 4 of IV, explaining the voting procedure and schedule for the election of the new EC, as set forth by the EC (IAGA News No. 17, p. 29). No questions arose from the floor.

Vice-president Cole took over the meeting and invited President Roederer to deliver his presidential address (see the full text of address in this IAGA News). At the conclusion, Cole commented that this address would no doubt be referred to many times in future years and that he thought that it contained many excellent and inspiring remarks.

II. Second Conference of Delegates on 14 December 1979, 1600–1800 in Copland Hall

President Roederer called the meeting to order and reported that the Secretary General had confirmed quorum: 21 of 32 accredited chief delegates were present. Roederer called attention to the agenda for the meeting as listed in the IAGA Abstract Booklet (p. 88) and added that there were several items to include under "Other Business." The Chief Delegate of the UK requested that a review be made of the value of the National Reports. Roederer then summed up the items to be added under "Other Business":

- (1) Approval of the additional Division leaders appointed since the first CD;
- (2) Request by the UK for re-establishment of the Sq and L Working Group;
- (3) Concurrence of the Chief Delegates with recent EC decisions;
- (4) Review of the value of the national reports. The amended agenda was adopted.

1. *Report of the Resolutions Committee and the Adoption of Resolutions*

Roederer invited Gadsden to present the resolutions (a copy of which had previously been distributed to all members). Roederer requested that comments be limited to changes of substance and that minor details of syntax, spelling and punctuation should be brought to the attention of the chairman of the Resolutions Committee or the Secretary General after the CD.

Gadsden thanked the Resolutions Committee for their dedicated efforts and fast work, adding special thanks for Dr. Blanc's offer to expeditiously translate the resolutions into French. Gadsden continued that two proposed resolutions were withdrawn and that one was deleted by the EC since its content had been deemed inappropriate for an IUGG resolution. He stated that three of the proposed resolutions originated in the EC.

Gadsden proceeded to offer the proposed resolutions for adoption: the Resolution of Thanks was adopted unanimously; however, the Chief Delegate of Egypt suggested it might be desirable to add specific names in this resolution since the Union would do the same with its

general resolution of thanks. A brief discussion ensued about past IAGA practice and it was agreed that the outgoing Association President would write letters of thanks directed to specific persons of the local Organizing Committee, thanking them for their efforts on behalf of IAGA. After this, the Resolutions were discussed one by one. Some minor amendments were introduced in some. Roederer thanked the Resolutions Committee for their excellent work. (The list of resolutions as approved by the CD is given separately in this IAGA News.)

2. *Report of the Finance Committee*

Roederer invited the Finance Committee to present its report. Sucksdorff read the report (Appendix 1) and projected the budget mentioned in the report (Appendix 2) on the screen. The Report of the Finance Committee was then formally accepted by the Chief Delegates. Roederer commented that letters will be written as requested by the Finance Committee in their report to the Secretary General for his diligent handling of IAGA funds, to the Japanese Government for the considerable support provided, and to the University of Tokyo for its generous assistance, all which have contributed in important ways to keep the administrative expenses of IAGA at a low level. The delegates showed by enthusiastic acclamation their appreciation of the tremendous efforts made by the Secretary General in attending to IAGA business matters.

Roederer commented on the meaning of a "period" as used for financial reporting purposes by the Union and added that the EC had agreed it would be helpful to have budget information on an *annual* basis for internal reporting procedures. Such additional breakdown would facilitate the determination of actual funds available to the Divisions as well as actual expenditures of funds for EC meetings. Roederer further pointed out to the delegates the new fact that an allocation of \$12,000 was budgeted as a line item for IAGA participation in ICSU projects. The Chief Delegate of Egypt recommended that this fact be made known to the Union. Roederer displayed on the screen the allocations apportioned by the EC to the Divisions (Appendix 3). UK Delegate Creer inquired about the method used to determine the individual amounts. Roederer stated that this was based on past participation in meetings and interest shown by the IAGA constituency in a questionnaire. Creer suggested that it might be better based on actual meeting attendance. Fukushima pointed out that page 131 of IAGA News #17 showed a histogram which had been prepared on the basis of the questionnaire sent to all IAGA scientists, and that it had been used in determining the allocation of Division funds. Creer reiterated that another look might be good. Roederer said he would pass this suggestion on to the next EC, and added that the amounts shown were not frozen but could be readjusted by the EC at any time. Parkinson inquired whether Division money could be used for attendance at workshops. Roederer responded that Division Leaders are free to allocate their funds to further their Division's business. Also, there can be special EC-approved allocations for travel of IAGA representatives. Concurrence on the projected budget was then given by the Chief Delegates.

3. *Reports from the Divisions and Interdivisional Bodies*

Roederer proceeded with a review of highlights from the reports submitted by the Divisions and Commissions. He reported on the dissatisfaction of the EC with the fact that some Divisions had not achieved good geographic distribution in the selection of their Working Group leadership, and pointed out the poor representation from LDCs. He continued that the Bylaws currently empower the Divisions to handle their own elections, but that the poor results

may suggest the need for a change in one of the Bylaws. Comments ensued with US Chief Delegate Tinsley (outgoing Chairman of Division II) stating that Division II had followed the Bylaws and had consulted within its working groups, and that good geographic distribution had been achieved. The Chief Delegate of the UK commented that Bylaws should not be changed, but that proper guidance should be provided to the Divisions instead. Roederer requested comments on this problem from Division leaders. Creer stated that Division I Working Groups elected their leaders independently and that they did not compare results. Roederer acknowledged this problem but stated that mechanics must be found to facilitate better geographic distribution. The Chief Delegate of Egypt commented that although the current process was called "democratic," this was not really the case, since the selection was made only from those attending the business meetings in question. He further stated that limiting Working Groups or Reporters to 12 members is not a good number anymore. Roederer stated that the EC may propose to re-establish a "membership at large" as a possible solution to this problem. Creer admitted to a possible bias by the current selection process but emphasized the importance of selecting active people. Rastogi commented that most meetings are held in Europe and the USA, therefore the number of attendees from those countries is always greater, a fact which further contributed to bias representation. Roederer stated that the EC would take due note of all these comments.

Roederer proceeded with a review of the highlights of the Division and Commission Reports. He stated that, based on the fact that there would be no COSPAR meeting in 1981, the EC has added 2 topics to the proposed program of Division III for Edinburgh, namely (1) a Symposium on the Voyager Flyby of Saturn, and (2) a Symposium on Planetary Magnetospheres. Gringauz commented that the latter might be too soon after the Symposium on this subject at the 1980 meeting of COSPAR in Budapest. After a brief discussion, it was agreed that the Edinburgh Symposium should be on Theory of Planetary Magnetospheres. This would remove a possible conflict with COSPAR. Roederer noted that the idea of focussing on theory had already been in the back of the minds of the EC when the conveners, Drs. Galeev and Siscoe, two noted theoreticians, were chosen. Roederer concluded by informing the delegates that the tentative program for Edinburgh will be published in the coming IAGA News.

4. *Election Results of the Executive Committee for the Next Four-Year Period.*

Roederer reported on the election process that took place over the past weekend. The slate originally proposed by the Nominating Committee was elected. The two additional nominees did not achieve the necessary votes. There being no challenges from the floor, the election ballots were ordered to be destroyed. (The names of the new IAGA EC members are shown in the new membership list in this IAGA News.)

5. *Invitation to the Fourth General Scientific Assembly of IAGA*

Roederer related that an invitation had been received from the British National Committee to hold the next Scientific Assembly in Edinburgh in 1981. The delegates approved acceptance by acclamation.

6. *Other Business*

- (1) The names of additional Division and Commission leaders were displayed on the

blackboard. Approval was given by the Chief Delegates. The final list of leaders (including those approved at the first CD on 3 December 1979) is seen in the new membership list in this IAGA News.

(2) Roederer reported that the request by the British National Committee for the re-establishment of an Sq and L working group had been accommodated as part of the Interdivisional Working Group on Relations between External and Internal Magnetic Variations.

(3) Roederer reported that the EC has decided to establish an *ad hoc* committee charged with the establishment of an Interdivisional Commission to Stimulate IAGA Sciences in Developing Countries. The outgoing and new Association Presidents will constitute this *ad hoc* committee and will submit a plan of action to the next EC meeting.

(4) Roederer related that the second joint IAGA/IAMAP EC meeting took place on December 12. Discussion had centered on consolidating a close contact between the Associations and the cooperation planned for joint meetings and symposia in Edinburgh and Hamburg. (The minutes of this meeting are given elsewhere in this IAGA News.)

(5) The Chief Delegate of the UK explained his request for a review of the value of IAGA National Reports, commenting that a lot of work and effort went into the preparation of these reports and thus expected that their value should correspond to this effort. The Chief Delegate of Canada commented that the Canadian Geophysical Bulletin was also used as the Canadian National Report and suggested that other countries may find a similar arrangement as a suitable solution to the problem. Comments from the floor showed a general consensus that the National Reports were indeed valuable, that they call attention to the research that is being conducted, and to papers which might otherwise not be made known. Roederer commented in conclusion that the EC will take note of the British Chief Delegate's comment and will urge maximum use of National Reports.

7. Concluding Remarks by the Outgoing President

Roederer indicated that the time had come for his concluding remarks as outgoing President. He began by commenting that, according to an old Austrian proverb, "all things have an end, except the sausage, which has two." So, although his term was ending, he would be around for four more years as past president. He mentioned that these have been four long and exciting years, indeed. At the personal level, particular excitement began when he moved to Alaska as Director of the Geophysical Institute in Fairbanks. This new position helped him broaden his horizon immensely, allowing him to perceive clearly the differences in ideiosyncrasy and methodology among the various IUGG and IAGA disciplines, which were all covered by his Institute. He went on to point out that one of the most exciting aspects of his tenure as president was the personal contact and friendship established with so many scientists from so many different countries. He concluded his remarks by symbolically transferring the presidency of the Association to President-elect Keith Cole affirming, with the words of an old Argentine saying, that the Association was "very much alive and wagging its tail."

President-elect Cole expressed his gratitude to the Association for conferring this high office upon him. He expressed his hope to be able to maintain the high standards set by the previous leadership, and while he was aware of the heavy duty of the office, he was willing to take it on. He expressed his appreciation for the leadership provided by Juan Roederer, for the dedication and hard work the outgoing president brought to this strong and vibrant

organization, and expressed his hope to be able to maintain these standards and perhaps even improve upon them.

Roederer declared the CID closed at 1800 hrs.

PRESIDENTIAL ADDRESS

Juan G. Roederer

During my first presidential address at the IAGA Scientific Assembly in Seattle, I broke with previous tradition and spoke about problems related to international science policy and international scientific cooperation. This time, however, under the watchful eye of our parent Union, I will return to the more traditional practice of focussing on matters specific to our Association.

During the past eight years, IAGA has gone through a big transition and evolution. Between Moscow and Grenoble it underwent a metamorphosis, emerging with a drastically new structure after the Kyoto Assembly. Between Grenoble and Canberra, it has had a chance of testing this new structure, and adopted new statutes and by-laws at the Seattle Assembly.

I believe that these changes were definitely not just changes in paper structure. There were changes in approach, in philosophy, and most importantly, changes in the pace and volume of our activities.

I believe that we have successfully completed a much needed transition from ceremonial traditionalism to scientific activism.

I believe that we have completed a transition from an instrument or technique-oriented structure to one that is discipline or program-oriented.

I believe that we are now an Association of the Union whose activities have fully turned toward truly serving its grassroot scientific constituency.

I believe that our Association has become *the* internationally recognized stable forum for magnetospheric physics, aeronomy, and solid-earth geomagnetism; that it is establishing itself as an important forum for ionospheric physics, and that it is beginning to play a useful role in solar wind physics.

Our Association is the first one of the Union which has the planets written into its objectives in the new statutes, and which at its meetings routinely deals with planetary magnetospheres, atmospheres and fields as a natural and logical extension of geophysics.

It is of course difficult to measure how successful all these transitions really have been. Three ways of testing come to my mind. First, to monitor the number and quality of papers presented at our meetings and the total number of participants. Or, perhaps a far more realistic measure of interest and effort to attend a meeting, to compute the total amount of participant-miles travelled per meeting. Such numbers indeed show that we have done impressively well.

Another way is to simply look at our mailing list. For instance, IAGA News is now distributed to 2400 addresses, compared to 1500 in 1975. Or the publications: statistics show that 86% of all IUGG publication sales pertain to IAGA publications.

Finally, less quantitative but perhaps even more relevant, is to observe the impact of IAGA's activities on other ISCU bodies. For instance:

URSI has reorganized its own structure and meetings by realistically taking into account IAGA's recent reorganization and the trends in scope, subjects and attendance of IAGA meetings.

COSPAR has decided to hold its meetings biannually instead of annually, out of phase with the IAGA scientific assemblies. Already, for years before, COSPAR has adjusted through active liaison with IAGA the topics for the meetings of its relevant working groups.

SCOSTEP has, from the very beginning, recognized the functions and the role of IAGA, and has drawn heavily on the talent housed in IAGA to staff its limited-duration projects. As a matter of fact, I believe that it is fair to say that in terms of magnetospheric and solar wind projects, SCOSTEP acts as a sort of "time-dependent arm" of IAGA! The International Magnetospheric Study is a case in point, whose official phase is ending but which has left a lasting impact on magnetospheric research in terms of data and information systems—not to speak of the new knowledge already gained.

So, where do we go from now? I said before that during the two previous Assembly periods, IAGA has gone through reorganization and testing of the new structure.

It is obvious that the next period should be one of consolidation. A period of adjustment, of fine tuning. Remove what did not work efficiently, fill in gaps, make better what is already good.

We have a very good chance of becoming "Number One" among international scientific non-government organizations dedicated to near-earth space, upper atmosphere and planetary magnetism. But we are far from being number one at home, for instance when it comes to financial support. We are one out of seven Union children. In Grenoble, mainly thanks to the efforts of our past president, Mme Troitskaya, the Union instituted categories of Associations with different levels of support. I believe that this process of reapportionment should be further refined, taking into account needs of the Associations, as for instance expressed by the number of symposia organized and papers presented, per period.

This task will not be easy. The Union itself is under great pressure. A radically new procedure by the ICSU of distributing its UNESCO appropriation to the Unions is in effect. There is a fixed allocation, independent of the size of the Union, plus contracts to support individual proposals from the Unions, reviewed and recommended upon by, believe it or not, ISCU's Finance Committee made up of seven members, about half of whom are biologists. Our Association will be in a real financial bind during the next period if we do not carefully learn the required game of grantmanship that this new ICSU procedure warrants.

But it is not just a matter of finances. I feel that the representation of IAGA disciplines in the Union's governing bodies is in no way in proportion to our size and strength. This of course is a matter that only the national IUGG committees and their delegates can resolve. I suggest that IAGA devise a strategy to persuade its National Adherents to promote within their own countries a better representation of IAGA disciplines in the IUGG Council and Bureau.

Our first reorganization, the increased emphasis on space subjects, and the transition from

an instrument oriented structure to a discipline oriented structure, have led to what I sense is a certain degree of alienation of developing countries from the participation in IAGA affairs. Ways and strategies must be found to counteract this most undesirable trend. It is not to be solved by just staffing IAGA units with a token LDC scientist here and there. This procedure is neither honest nor effective in its ultimate purpose. I propose that IAGA develop a plan of what in my country is called "affirmative action": in other words a plan of action in which the initiatives to engage developing countries in IAGA affairs come from the representatives of advanced countries, with special projects, programs or meeting topics targeted specifically to the interest of developing countries.

IAGA must keep a constantly watchful eye on developments in the reorganization of ICSU. IAGA in itself is bigger than quite a number of Unions. As stated before, we are being recognized as the stable forum for a large chunk of what one usually calls space research. Yet as just one of seven Associations of what really is a "superunion", we have no direct channel whatsoever to ICSU. I submit that it is time to start more than just thinking about this circumstance.

In terms of scientific activities in the future I have the following comments. First, I would like to see a strong involvement of IAGA in the Middle Atmosphere Program of SCOSTEP. As strong an involvement as was IAGA's participation in the IMS. The same applies to the IUGG-IUGS follow-up to the Geodynamics Project, recently named the International Decade of Earth's Crust and Mantle (IDECAM). But, if I may speak from my own experience with IMS, it is not enough to just participate in planning meetings. One must cause impact through constructive and innovative commotion!

I would like to see a strengthening of our role in solar wind physics and an expansion of our coverage of the aeronomy and magnetism of other planets.

Our improved relationship with IAMAP has not yet really come to any tangible fruition except for the conduct of some joint symposia.

In this coming period we must look into the second half of the eighties and we must keep constantly informed of what our member countries and other ICSU bodies are planning. Let us not miss the boat!

Now that the official observational phase of the IMS is nearing an end, IAGA should consider offering its auspices to the new services set up during the IMS, such as the Central Information Exchange Office, the Satellite Situation Center, the series of Coordinated Data Analysis Workshops, all of which according to general consensus, should continue in operation throughout the eighties.

And, last but not least, IAGA must turn aggressively to the new project-oriented, contract-oriented financing policy of ICSU to which I have referred before, to secure the support it needs by whatever means are called for—even if this requires open or behind-the-scene lobbying!

In the long range, IAGA's problems will be compounded by the increasing difficulty in many countries of securing adequate governmental support of basic science projects. Less and less is science left to take its own course of direction and course of action. More and more scientists are forced to achieve preset goals within present times. As I already stated in my

Seattle address, there is a widespread trend in many countries of demanding from basic science societal relevance, immediate accountability and immediate applicability. This trend is prostituting basic research endeavours by tempting us protagonists into making unrealistic, unfulfillable, often outright dishonest promises to our sponsors.

In order the IAGA to prosper scientifically, IAGA Executive and Division officers must not only be good and active scientists. They must be keenly aware of science policy issues and trends in the member countries, in order to steer the Association along a path that recognizes realities. However, for what its worth, the Association, through its constituency, must also contribute effectively to alerting the science administrations and state and political organs of its member countries of the true role and value of basic science to their well-being and economic strength in the long term. As centuries of history have shown, basic science has *shaped* our society. For it is from that basic science whose development is spurred by intellectual curiosity and by nothing else, that technology ultimately spins off. *Any* topic of basic science is relevant, no matter how removed from applicability it appears at one time or another during the course of its development—as long as it contributes to the understanding of our world and man's place in it.

IAGA deals mainly with basic research topics, although no doubt many of them have, or will have in the near future, a direct link to applied research. In view of our international character and the harmonious relationships, often strong bonds of personal friendships, among its constituent scientists from many nations and political systems, we are in a vantage position to join scientists from other disciplines in a missionary action on which, I submit, the future of human society may well depend: to preach on behalf of the salvation of basic research.

REPORT OF THE SECRETARY GENERAL

N. Fukushima

It is a great honour for me to report to you the activities of IAGA during the past four years since the Grenoble Assembly held in September 1975. I assumed the position of Secretary General immediately after the Grenoble Assembly, and was at once aware of the great effort of my predecessor, Dr. Leroy R. Alldredge, and the past presidents who contributed greatly to the remarkable growth of IAGA activities. IAGA has now become the most active and probably the largest Association within IUGG.

IAGA's growth of activity is of course the result of the great effort by you and your colleagues over the past years. Unfortunately, during the last four years we have lost some of our distinguished IAGA scientists, such as Drs. Albert Price (U.K.), Jan Bouska (Czechoslovakia), David Knapp (U.S.A.), Ulf Fahleson (Sweden), Takao Tohmatsu and Naoto Kawai (Japan) and other who were seen often at past IAGA meetings. Other key persons who contributed very much to the IAGA activity in member countries have also passed away. They were Drs. Ispir (Turkey), D. C. Martin and W. Bullerwell (U.K.) Zheming Chen (China), Y. Hagihara and Y. Aono (Japan) and others. It is practically impossible to list the names of all our deceased colleagues who supported our research work. I would like to ask you now to have a minute's silence to pay tribute to those colleagues of the IAGA community.

This Assembly in Canberra is the first occasion in the past 60 years' history of IUGG/IAGA to have our meeting in the Southern Hemisphere. Just prior to this Assembly IAGA held a major symposium on the International Magnetospheric Study in Melbourne organized jointly with SCOSTEP. Most of these participants have come to Canberra to participate in the IAGA Canberra Assembly.

In preparing the IMS symposium and this IAGA General Assembly, our colleagues in Australia have worked extremely hard to make our meetings enjoyable and successful. On behalf of all the participants I would like to express our sincere thanks to them, especially to Drs. Keith Cole, Dudley Parkinson, Peter McGregor and their colleagues.

In the preparation of the IAGA programs for this Assembly, the IAGA Programs Committee tried to avoid conflict with simultaneous sessions of IUGG symposia and those within IAGA as much as possible. Still, it is practically impossible to solve this problem because IAGA's activities are now so wide. Hence I have to beg your pardon in advance if some of you have trouble with the IAGA program. It is regrettable that we could not adjust the session schedules which coincide with IUGG symposia.

The main events of IAGA during the past four years are already known to you through the IAGA News. So I will not repeat them now. IAGA held its Third General Scientific Assembly in Seattle in August/September 1977 with IAMAP, and the Transactions of the Seattle

Assembly published in 1978 describe every detail of this successful assembly. IAGA adopted the new Statutes and By-Laws at the Seattle Assembly, and now all IAGA administration is being conducted according to these new Statutes and By-Laws.

As to the implementation of the IAGA Resolutions of the Seattle Assembly, I received reports from Australia, Portugal, Spain and Sweden. It is clear that the resolutions have been very useful for improving the background for future development of research and study in geomagnetism and aeronomy. I will summarize this matter in the next issue of the IAGA News.

IAGA has a friendly relationship with its sister associations in IUGG, other unions or committees in the ICSU family such as URSI, IUPAP, IUGS, SCAR, COSPAR, SCOSTEP, and others. The reports of the co-sponsored international meetings have been published each time in the IAGA News.

IAGA News has been published on a yearly basis, but the publication of No. 18 has been postponed until early next year, in order to report the important results of this Assembly to our colleagues who unfortunately are unable to attend. The IAGA News No. 19 will be issued at the end of 1980, and this will contain the information on our next Scientific Assembly which will be held in August 1981 in Edinburgh, as a result of the kind invitation of our British colleagues. Now the IAGA News is being distributed to about 2400 persons and organizations, an increase from approximately 1500 in 1975, which also shows the great expansion of IAGA's activity in recent years, including quite a number of new young colleagues. My wish is to distribute the IAGA News to all of our colleagues over the world, but in this I need your help to complete the distribution list. Please let me know the names and addresses of your new colleagues. I would also welcome your comments and advice on the IAGA News, and I am very grateful to those of you who have kindly supplied me with useful information for the IAGA community.

As to our other publications I have to mention the great effort of the International Service of Geomagnetic Indices which has been publishing these yearly publications for the entire geophysical community. All IAGA publications play an important role in the world geophysical community.

As to the finance of IAGA, I am now asking the Finance Committee to check the report for the past four-year period. IAGA allocated to each Division and Interdivisional Body some funds to encourage their own activities. This policy will be followed also in the next four-year period. Although the IUGG's financial situation is facing difficulties due to the world's inflation and IAGA cannot expect to receive more funds from IUGG, IAGA will try to use its funds as effectively as possible for the whole IAGA community.

I would like to thank all the IAGA member countries and their national correspondents who always make a great effort to obtain funds for their colleagues within the IAGA community. The success of this Assembly in Canberra owes a great deal to their efforts in obtaining travel expenses from their own sources.

Before I finish my talk, I would like to express our thanks on behalf of IAGA, to the leaders of IAGA Divisions, Interdisciplinary Commissions and Working Groups, Topic Reporters and Working Group Leaders who devoted their time to the development of IAGA activities during the last four years. We thank also the convenors of various IAGA sessions of this

Canberra Assembly for their great effort. Now I hope you enjoy this Canberra Assembly arranged by our Australian colleagues, and I believe that this Assembly will be a memorable milestone in the history of IAGA.

REPORT OF FINANCE COMMITTEE

The Finance Committee, consisting of R.G. Johnson, Chairman, H. Maeda and C.G. Sucksdorff, held a meeting on Friday, November 30, 1979 in Melbourne, and examined the finance account for the period 1 January 1975 to 31 December 1978. All the documents received from the General Secretary, Naoshi Fukushima, were very clear and had already been checked by the University of Tokyo Chief Accountant S. Ito.


At the beginning of the period the cash on hand and in banks amounted to \$31,201.52 and at the end of the period to \$32,168.87. A talk with the General Secretary revealed that a significant decrease of these funds is expected as a result of the expenses associated with the XVII General Assembly.

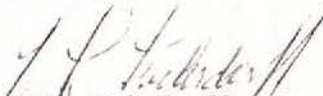
On the basis of the statement presented and the detailed information supplied by the General Secretary, which we deem satisfactory, we endorse the report and recommend that it be accepted.

We further propose that IAGA express its thanks to the General Secretary for the excellent management of the limited funds. Special thanks should go to the Government of Japan for considerable financial support, and to the University of Tokyo for its generous assistance, which have contributed in important ways to keeping the expenses to IAGA at a low level.

Melbourne, November 30, 1979.


R.G. Johnson


H. Maeda


C.G. Sucksdorff

(FORM 1)

INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY

Financial Report for the Period 1975 - 1978


Amounts in USA dollars

Exchange Rate

RECEIPTS	IUGG	GRANTS & CONTRACTS	EXPENDITURES	IUGG	GRANTS & CONTRACTS
16. IUGG ALLOCATION	77,400.00	x	11. ADMINISTRATION		
2. UNESCO GRANTS	x	0	11.1. Personnel	3,426.50	x
3. OTHER GRANTS	x	4,000	11.2. Quarters (rents and services) ..	0	x
4. CONTRACTS WITH UNESCO etc.	x	0	11.3. Supplies and Equipment	584.60	x
5. SALES OF PUBLICATIONS ...	5,477.92	x	11.4. Communications	8,987.23	x
6. MISCELLANEOUS	<u>3,053.31</u>	<u>x</u>	11.5. Travel (administrative only) ...	5,042.41	x
7. TOTAL RECEIPTS	85,931.23	4,000	11.6. Miscellaneous	0	x
8. CASH ON HAND & IN BANKS			12. PUBLICATIONS		
Jan 1, 1975	<u>31,201.52</u>	<u>0</u>	12.1. C.R. Assemblies	8,639.80	0
10. TOTAL	117,132.75	4,000	12.2. C.R. Symposia	0	0
			12.3. Periodicals	14,596.31	0
			12.4. Others	0	0
			13. ASSEMBLIES		
			13.1. Organization	1,593.12	0
			13.2. Travel	10,058.14	4,000
			14. SYMPOSIA		
			14.1. Organization	0	0
			14.2. Travel	8,446.07	0
			15. SCIENTIFIC MEETINGS	23,312.92	0
24. ACCOUNTS RECEIVABLE ..	...	...	17. GRANTS (Permanent Services, etc.)	0	0
25. ACCOUNTS PAYABLE .....	...	...	18. CONTRACTS WITH UNESCO, etc.....	0	0
			19. MISCELLANEOUS	<u>276.78</u>	<u>0</u>
			20. TOTAL EXPENDITURES	84,963.88	4,000
			21. CASH ON HAND & IN BANKS		
			Dec 31, 1978	<u>32,168.87</u>	<u>0</u>
			23. TOTAL	117,132.75	4,000

Date: 23 February 1979

Audited by

S. Ito S. Ito, Chief Accountant
Faculty of Science, University of Tokyo

INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY

(FORM 2)

Financial Report for the Year 1978

Amounts in USA dollars

Exchange rate.....

RECEIPTS	IUGG	GRANTS & CONTRACTS	EXPENDITURE	IUGG	GRANTS & CONTRACTS
16. IUGG ALLOCATION	24,700.00	x	11. ADMINISTRATION	7,653.04	x
2. UNESCO GRANTS	x	0	12. PUBLICATIONS	11,277.53	0
3. OTHER GRANTS	x	0	13. ASSEMBLIES	0	0
4. CONTRACTS WITH UNESCO etc.	x	0	14. SYMPOSIA	0	0
5. SALES OF PUBLICATIONS	785.26	x	15. SCIENTIFIC MEETINGS	5,322.81	0
6. MISCELLANEOUS	<u>406.26</u>	<u>x</u>	17. GRANTS (permanent services etc.)	0	0
7. TOTAL RECEIPT	25,891.52	0	18. GRANTS WITH UNESCO etc	0	0
8. CASH ON HAND AND IN BANKS			19. MISCELLANEOUS	<u>12.71</u>	<u>0</u>
Jan. 1, 1978	<u>30,543.44</u>	<u>0</u>	20. TOTAL EXPENDITURE	24,266.09	0
10. TOTAL	56,434.96	0	21. CASH IN HAND AND IN BANKS		
			Dec. 31, 1978	<u>32,168.87</u>	<u>0</u>
			23. TOTAL	56,434.96	0
	Jan. 1, 1978			Dec. 31, 1978	
24. ACCOUNTS RECEIVABLE	0	0		0	0
25. ACCOUNTS PAYABLE	0	0		0	0

Break-Down of Item 11

11.1 Personnel	1,800.00
11.2 Quarters	0
11.3 Supplies and Equipment ..	584.60
11.4 Communications	3,484.60
11.5 Travel (administrative) ..	<u>1,783.84</u>
Total	7,653.04

Break-Down of Item 12

12.1 C.R. Seattle Assembly	6,739.80
12.2 C.R. Symposia	0
12.3 Periodicals (IAGA NEWS) ..	4,537.73
12.4 Others	<u>0</u>
Total	11,277.53

Date: 23 February 1979

N. Fukushima

N. Fukushima
Secretary General, IAGA

Appendix 2b.

Appendix 3.

DETAILED BREAKDOWN OF THE PROPOSED IAGA 1980-1983 BUDGET

For	Amount	Remark	
Publications	\$ 35,000	2 Transactions and 4 News mainly postage, 0 for quarter: organization and travel	
Secretariat Administration	28,000		
Assemblies	14,000	These may be used for administration, internal publication, and travel support, and others.	
Allocation to Division I	5,000		
" Division II	6,500		
" Division III	6,500		
" Division IV	3,500		
" Division V	5,000		
" Antarctic Res. Comm.	500		
" History Commission	500		
" Middle Atmosphere Comm.	1,500		
" Ext/Int. Interdiv. WG	1,500		
" IAGA/URSI Joint WGs	1,500	Support to ISGI	
Permanent Service of Geomag. Indices	4,000		Bank handling charge, etc. for developing countries
Miscellaneous	2,000		
IUGG Travel Grants	6,000	Approval by EC required	
IAGA Participation in ICSU Programs	12,000		

Total: \$133,000

MINUTES OF THE IAGA EXECUTIVE COMMITTEE

during the XVII IAGA General Assembly
Canberra, Australia

The IAGA Executive Committee (henceforth EC) met 10 times during the Canberra Assembly as shown below.

December 3, 0700-0900, 1215-1345*; December 4, 1930-2150; December 5, 1930-2200;

December 11, 0700-1100; December 12, 0830-1015*, 1400-1700, 1900-2100**;

December 13, 1500-1550, December 14, 0800-1000*.

(Remark * with Division and Interdivisional Body leaders

** with IAMAP Executive Committee)

All EC members were present except G. M. Weill and M. Ackerman who expressed regrets for their absence. V. Bucha missed the first meeting because of his travel schedule, and A. J. Dessler had to miss the last 5 meetings because of his early departure from Canberra.

The minutes of the meetings with the leaders of IAGA Divisions and Interdivisional Bodies and with the IAMAP EC are given separately. The following is a summary of discussions of the IAGA EC meetings only, without keeping the chronological order of discussions.

I. Approval of the Agenda

Roederer informed the EC that he and the Secretary General recommended a different ordering of Agenda items than that originally submitted to the EC members. The reason for the changes was a need to phase subjects with the course of events expected during the Assembly. After some minor changes the schedule was approved.

II. Minutes of the Previous Meeting and Matters arising from the Minutes

No corrections of substance were suggested and the minutes were approved. Roederer led off the review of matters arising from the minutes, pointing out that the proposed change in Bylaw 16c had been accomplished at the Conference of Delegates. One matter still needing implementation is organization of the Interdivisional Commissions so as to satisfy Division representation (p. 19, minutes La Londe) Roederer referred to some action items suggested at La Londe concerning the subject of COSPAR reorganization. These, however, were not implemented. He had deemed it inappropriate to prepare a IAGA position paper on the subject at the suggested time, and he had been unable to attend the Bangalore meeting.

III. Report on the IUGG Executive Committee and Council Meetings

Roederer explained that three series of meetings take place one after another, with nearly

the same agenda: 1. IUGG Bureau, 2. IUGG Executive Committee, 3. IUGG Council. He mentioned, in passing, the poor representation of IAGA-affiliated persons in all these bodies.

Some information items were:

(1) Strong action will be taken against those member countries in arrears.

(2) A new scheme is in effect at ICSU for distribution of UNESCO funds to the Unions: a fixed sum is given to each one irrespective of its size; beyond that, funds are made available on contract basis. In order to share in the money, IAGA must develop skills in grantsmanship. The IUGG Secretary General has been asked to supply to the Associations the rules and regulations governing these grants and has indicated that each Association should set up a scheme by means of which proposals are routed within the Association to its Secretary, who then is to submit these to IUGG. The Union will *not* make judgements of proposals from Associations because ICSU's Finance Committee will consider projects individually, and without regard to their origin. In addition, Roederer reported that the ICSU subcommittee on Scientific Priorities is requesting proposals for special projects for the period 1984-89 (separate from the yearly contracts with the Unions), to be submitted by August 1, 1980.

(3) The Union will be unable to increase its allocation to the Associations in spite of an expected 15% increase in income from dues.

(4) Roederer said that the structure of ICSU is under study. The suggestion seems to be that there should be groups of Unions, and that more power be given to the Unions. On the other hand, there is talk of a "bicameral" structure for ICSU, with a scientific body and a governmental body ruling the organization. Roederer said that this could be the end of ICSU.

(5) The changes in statutes proposed by the IUGG Bureau were all approved by the Council. The main gist of these changes was to remove veto power of the Assembly over items passed by the Council. Also, the Bylaw stating that Associations cannot hold meetings on their own during IUGG General Assemblies was removed.

(6) The IUGG Bureau has authorized funds for the follow-up program to the Geodynamics Project, the new International Decade of the Earth's Crust and Mantle, IDECAM, to be provided in 2-year cycles. Carl Kissinger will be chairman of the Steering Committee.

(7) IUGG President Ashour urged that participation of developing countries in Association affairs be substantive rather than token.

(8) Roederer reported that a discussion was held on Union representation in various ICSU Scientific and Special Committees, Interunion Commissions and Services. The two representatives in SCOSTEP (Roederer, Belmont) will remain until the end of 1980. IAGA and IAMAP will be asked to propose the new representatives next year.

(9) The Union lectures will be taped this time and will appear in the IUGG Chronicle. Melchior has requested that the Associations prepare 3-4 page reports highlighting their meeting activities, also to be published in the Chronicle.

(10) Proposed meeting places were discussed for the 1983 IUGG Assembly. The proposals from Federal Republic of Germany, India and Chile must be voted on at the second IUGG Council Meeting on 14 December.

Finally, Roederer mentioned that the question of the membership of China was again brought up. A tricky problem is that there seem to be two ICSU bodies which will have both Chinas as members, like the two Koreas, Germanys, etc.

IV. Preparation for the IAGA Conference of Delegates (CD) during the Canberra Assembly

The Committee then turned to the preparation for the first CD (scheduled on 3 December afternoon) of the Canberra Assembly. It appeared that only three items will require voting, i.e. concurrence with EC decisions taken in La Londe des Maures, ratification of new Division leadership, and the proposed change in bylaws. The remaining items will be for information only. The address of welcome is to be given by Dr. W. D. Parkinson.

Some problems encountered with the Nominating Committee were discussed; it had proved impossible for them to prepare a slate in time for the first CD; however the voting procedure calls for nominations to be made known to the Chief Delegates at the latest by Tuesday (4 December) evening and this deadline would be met. Additional nominations have to be submitted to the Chairman of the Nominating Committee by Thursday (6 December), and the ballots are to be received by Saturday (8 December) evening. The candidates for the scrutineers were also considered.

For the second CD (scheduled on 13 December), all the decisions of the EC meetings during this Canberra Assembly are to be reported in addition to the scheduled agenda (Resolutions, Finance Committee Report, etc.).

V. Review of IAGA Activities

Fukushima stated that a number of reports from Working Groups and Commissions have been received and expressed his hope that a complete set would be available for publication in the next IAGA Transactions. He further reported on the receipt of a proposal from the British National Committee about possible improvement of the internal IAGA structure, which was forwarded to the pertinent Division leaders. A lengthy discussion ensued on where best to fit the British proposal to give an appropriate slot for the phenomena that result from dynamo action in the ionosphere and oceans such as Sq and L. Consensus of the EC was to recommend to the Interdivisional Working Group on External/Internal Variations that they broaden their scope to include the subject of Lunar and Sq variations.

Roederer reminded the EC that, in accordance with Bylaw 2, it is required to review the productivity of the Divisions and Working Group. Gadsden inquired about the activity of the Interdivisional Commission on the Middle Atmosphere. Fukushima reported that they had been asked to establish their internal structure. Roederer stated that there should be an effort of this Commission to interact with other Divisions. Gadsden and Roederer will confer with Megill upon his arrival. It was also reported that Fukushima was informing the Interdivisional Commission and Working Group Chairmen to make efforts to make these bodies truly interdivisional.

Dessler mentioned that he and Cole had discussed the fact that not much is being done about inclusion of developing countries in IAGA activities. Perhaps some meaningful offices could be created within each Division, such as assistants to the leaders so that scientists from LDC's may acquire knowledge and gain experience in IAGA affairs. Roederer suggested the establishment of an Interdivisional Commission on Education and said that the Union is embarked on such a project. A lively discussion ensued, with Roederer commenting that such approaches are often rejected by developing countries for lack of relevance to their current problems. Troitskaya agreed that it would be difficult but not impossible to find the

appropriate subject. Roederer commented that a Mayaud-type trip of a scientist from an advanced country travelling under IAGA sponsorship to developing countries would be useful. Roederer and Troitskaya agreed that to succeed, the approach must be "revolutionary" and insure that IAGA can be truly influential in its implementation. The EC agreed to establish an *ad hoc* Committee with the charge to recommend to the EC in 1980 the possibility of formation of an Interdivisional Commission to Stimulate IAGA Sciences in Developing Countries. The *ad hoc* committee should also propose means of operation, programs and possible activities (working groups or symposia) for IAGA Assemblies on the subject in question. Consideration then turned to the make-up of this *ad hoc* committee. It was agreed that the new and the past IAGA President should comprise this *ad hoc* committee and that they should prepare a plan of action for presentation at the next EC meeting.

It was introduced that there were inquiries why the excellent Reporter Reviews are not published all together in one place. A discussion ensued about the desirability of doing this and possible ways and means. Although no conclusion was reached, this is a matter that should be discussed again at some future date.

VI. Liaison with IAGA National Bodies of Member Countries

Fukushima reported that contact with the National Bodies had been good, and that many requests have been received from developing countries for IAGA News. He added that the IAGA News has been distributed also to 19 organizations and 30 individuals in 21 non-member countries. Roederer commented however that the number of responses to Fukushima's request for comments on the effect of the resolutions has not been as good as hoped for. Gadsden said that this should improve since in future the names and addresses of the original proponents would be on record.

It was felt desirable to express IAGA's gratitude to those member countries that hosted in recent years successful international conferences in the field of IAGA's interest, including IMS and other projects, with or without the cosponsorship of IAGA.

VII. Cooperation of IAGA with Other Association or Inter-Association Bodies within IUGG

Fukushima reported that at present the only Interassociation body within IAGA is the joint IAGA/IAMAP Advisory Board. The joint IAGA/IAMAP EC meeting to take place next Wednesday evening, will discuss how this Advisory Board will function.

Fukushima reported on the IAGA representatives on IUGG committees; i.e. Committee on Geochemistry (Weill is IAGA Representative), Committee on Advice to Developing Countries (Ashour is chairman and may also be considered the IAGA representative), and the Committee on Mathematical Geophysics (where Runcorn may be considered the IAGA Representative). A discussion ensued about the known activities of these committees, with Roederer commenting that the committee dealing with developing countries might be a point of contact for IAGA's *ad hoc* committee.

Fukushima continued his report on this agenda item, relating that a letter was received from Shebalin, requesting support for the IUGG *ad hoc* Working Group on Earth Parameterization. A lengthy discussion followed when the EC tried to determine what support could reasonably be provided and who could best do it. It was noted that while

parameterization is possible in solid earth geophysics and on some long-term aspects of the oceans and the atmosphere, IAGA deals mostly with rapidly varying systems for which parameterization does not make much sense. Agreement was reached that Roederer would contact Dr. W. Olson to determine what interaction there has been with that WG and then try to talk with Shebalin to determine exactly what kind of input he was expecting from IAGA.

Concerning the ELAS project, Fukushima stated that IASPEI has expressed a desire for better cooperation.

VIII. Cooperation of IAGA with URSI, COSPAR, SCOSTEP, and other ICSU Bodies

Fukushima reported that IAGA had good relations with URSI. Four Joint Working Groups exist which meet at General Assemblies of IAGA. The EC agreed to make an official statement that this cooperation be continued through these four Joint Working Groups. It was reported that Roederer had sent a congratulatory message when URSI celebrated its 60th Anniversary in September 1979. A brief discussion followed about the time conflict with the next IAGA Assembly (3-15 August 1981) and the next URSI General Assembly (10-17 August 1981). The Division leaders have been alerted regarding the partially overlapping dates.

The COSPAR report on its XXII Meeting and Associated Activities in Bangalore will be part of the next issue of IAGA News. From 1980 on, COSPAR will hold its meetings in even years, which will avoid conflict with IAGA Assemblies. On the COSPAR Panel on Potentially Environmentally Detrimental Activities in Space, Weill is the IAGA and IUGG representative. This panel has been working very well. the COSPAR Meeting in 1982 (Toronto, Canada) will also feature the regular 4-year cycle STP Symposium.

The relationship with SCOSTEP was reported to be excellent. Cole, President of SCOSTEP, reported that a financial problem may arise now that SCOSTEP has been made a Scientific Committee; such ICSU Committees are not normally supported by the Unions. Roederer mentioned that there are several areas where IAGA has strong interactions with SCOSTEP, for instance the Data Analysis Phase of IMS, MAP, STIP, SMY, the Committee on Sun-Weather Relations, etc. Agreement was reached that a strong recommendation would be made to IUGG emphasizing the importance of continued support to SCOSTEP by the Union even if it is now a Scientific Committee. In addition, a recommendation by IAMAP to the same effect should be solicited. A new SCOSTEP constitution has been drafted in which more influence will be given to the national representatives, giving them a say in the selection of the chief officers. Ratification of the constitution will take place at the Budapest meeting. So far as programs are concerned, Cole mentioned that all are going very well. The STP meeting in 1982 will follow the pattern of past meetings and will be held in association with COSPAR.

Troitskaya asked whether a possible date could be determined for the IMS meeting recommended by the IMS Steering Committee to be held in the USSR. The EC reviewed the various dates of STP, IAGA and IMS-related meetings already firm and known at this time, and concluded that it would be difficult to fit such an IMS meeting within the time frame 1981-1983.

Fukushima reported that the ICSU Panel on WDC's is very active now. Copies of the Panel's Fourth Consolidated Guide to International Data Exchange has been sent to IAGA National Committees as well as principal institutions and observatories. The Commission on Cosmic Rays of IUPAP is planning a joint meeting with IAU, and the next one is proposed to

be held jointly with IAGA in three years. Roederer commented that he felt it very important for IAGA to become involved with interplanetary space programs.

Fukushima continued that Nagata, the IUGG representative to SCAR, had pointed out the lack of formal IAGA representation on SCAR's permanent Working Group on Upper Atmosphere Physics. This was brought to the attention of the IUGG Executive Committee. There was consensus that Nagata would be the IAGA representative.

IX. IAGA's Participation in the Middle Atmosphere Program and other International Projects (including cooperation with IAMAP)

Fukushima stated that a report has been received from Taubenheim on MAP, in which he states that he will attend the 1980 MAP Steering Committee meeting. Gadsden related that the Interdivisional Commission on the Middle Atmosphere would work closely with Divisions II and III, and that the following symposium is planned: four half-days during the second week in Edinburgh (Middle Atmosphere Scientific Symposium I), and four half-days during the first week in Hamburg (MASS II). This symposium will be closely coordinated with Ruttenberg through a joint Program Committee. Gadsden further related that Megill is planning a session on the measurement of solar maximum effects on the mesosphere.

A brief discussion ensued about the composition of the Joint Advisory Body with IAMAP, noting the lack of a IAMAP representative for ICMUA. It was decided that an offer would be made to IAMAP to have an additional representative in the Joint Body (i.e., four vs. three from IAGA). Gadsden commented that Rishbeth will head the program committee for MASS but may want to appoint his own deputy. He continued that current plans are to ask Rostoker to appoint M. H. Rees as Division II representative, which was later confirmed.

Roederer referred to the letters received from Valencio and Bucha on the IUGG Task Group on Post-International Geodynamics Program Planning. Future IAGA representation on IDECAM was discussed and it was agreed to designate Valencio in that capacity.

X. IAGA Cosponsorship of International Conferences

Fukushima reported on the cosponsorships approved at the previous EC meeting. Reports on these meetings will be included in the next issue of the IAGA News. The IAGA/URSI Joint Working Group was responsible for IAGA Session II-1 at this Canberra Assembly. The session was sponsored through COSPAR and URSI.

SCOSTEP had asked for IAGA cosponsorship of the STIP Workshop on Solar Radio Astronomy, Interplanetary Scintillations and their Co-ordination with Spacecraft at Culgoora, Australia, in November 1979. Gringauz was the IAGA representative although he could not attend. The IAGA cosponsorship was given to the Symposium on Middle Atmosphere Dynamics and Transport to be held in Urbana, Illinois, U.S.A. during July 28-August 2, 1980 and Megill was appointed IAGA representative. Roederer commented that the above were requests for cosponsorship of "category 3" meetings which require only president's approval, since they were of a regional nature and required no money.

Three requests received from COSPAR, however, should be approved by the EC. These are: (1) Symposium on Progress in Planetary Exploration; (2) Symposium on Cosmic Rays in the Heliosphere; and (3) Symposium on Active Experiments in Space Plasmas. The requests were discussed and conclusion was reached that a letter would be sent to Dr. Denisse,

informing him that cosponsorship had been approved for Symposium 1 (N. F. Ness will be the IAGA representative), and that cosponsorship of Symposium 2 is approved (name of IAGA representative will be informed when it is decided). Symposium 3 had been earlier approved by IAGA.

The EC also considered and approved sponsorship and financial support (to the extent of travel for the IAGA representative) of the Sixth International Symposium on Equatorial Aeronomy (SEA), scheduled for 17-24 July 1980 in Puerto Rico. Dr. H. Rishbeth will be the IAGA representative.

It was reported that IAGA Working Group I-3 planned to have its Fifth Workshop on Electromagnetic Induction in the Earth and Moon during 17-24 August 1980 in Istanbul, Turkey. The EC agreed to give IAGA cosponsorship to this workshop.

The IAGA cosponsorship was also extended to the Workshop on Latin American Geomagnetic Observatory and Survey Practice (20-26 July 1980, in Rio de Janeiro) as a category 3 conference. K. L. Svendsen is included as a coorganizer.

Roederer brought up the matter of the complaint from one individual British scientist concerning his short notice of a recent IAGA-sponsored meeting. The EC discussed this in some detail and concluded that the British Chief Delegate will be informed that the EC appreciates being made aware of this incident and that it will keep the requirement for reasonable advance notice in mind when considering future requests for sponsorship. No action was deemed necessary to amend in any way the La Londe action which clarified the rules governing cosponsorship of international meetings. (IAGA News 17, p. 26)

XI. IAGA Publications

Fukushima reported on the publication of the IAGA Bulletin series as follows.

- No. 41 IAGA Transactions of the Third General Scientific Assembly, Seattle, U.S.A., 22 August-3 September 1977 (appeared in August 1978). Price \$10
- No. 42 Program and Abstracts of the Symposium on the International Magnetospheric Study, 27 November-1 December 1979, Melbourne, Australia. Price \$3
- No. 43 Program and Abstracts of the XVII IAGA General Assembly, Canberra, Australia, 3-15 December 1979. Price \$5

It was also reported that IAGA Bulletin No. 32—series "Geomagnetic Data (Indices, Rapid Variations, Special Intervals)" have been published regularly on a yearly basis, with the effort of the International Service of Geomagnetic Indices, De Bilt, Netherlands, despite the reduction of financial support from UNESCO.

The IAGA EC agreed to express its thanks to Dr. D. van Sabben for his continuous effort to maintain the ISGI service. It was also introduced that 86% of the IUGG publications sales are IAGA Bulletins, showing the usefulness of IAGA publications in the world geophysical community.

As to IAGA News No. 18, which will contain the brief summary of the Canberra Assembly, it was agreed to delay the printing schedule to February 1980, in order to include the French translation of the Canberra resolutions. It was reported also that the need for IAGA News is increasing steadily (now 2400 copies in comparison with 1500 in 1975).

XII. IAGA Finances

Roederer asked the EC to review the Financial Report prepared by Fukushima, covering the period 1975 through 1978 (*see p.26*) and the Estimate of Income and Expenses for 1979-1982.

Allredge conveyed a message from the IUGG Treasurer that a small technical amendment was necessary in the Finance Report for 1975-1978 regarding the grants from UNESCO and IUGG. Fukushima commented that the Financial Report for 1975-1978 was already checked by the Finance Committee, and its report was to be presented to the second Conference of Delegates. He also emphasized that the IAGA's balance is not at all strong despite the impression from the figures in the report, because the cash on hand and in banks on December 31, 1978 contained a considerable amount of funds reserved by Divisions for use for this Canberra Assembly. A lengthy discussion followed when confusion arose over carry-forward funds, actual balances available to the new Division leaders, how to determine the true costs of the EC meetings, and how to provide for desired support of specific limited duration projects. Three recommendations emerged concerning the budget preparation; (1) Roederer recommended that the new EC develop an internal budgeting procedure running on periods (as defined in Statute 5) rather than on calendar years, which will provide a clearer break-down of what funds are available for administrative purposes; (2) Roederer also stated that the new Division leaders will have to be informed exactly on what funds are available for their Division for the interval 1980-1983; (3) Cole recommended that a line item be included in the internal IAGA budget to provide \$12,000 for IAGA participation in ICSU programs (with provisional amounts of \$4,000 for MAP, \$4,000 for the IMS Data Analysis Phase, \$2,500 for SMY, and \$1,500 as an inflationary cushion). Gadsden commented that this reduces the expected cash-in-hand balance by \$12,000 and will be in keeping with requests from the Union to reduce this balance. Corresponding adjustments were then made on the Estimate of Income and Expenses for 1979-1982. Roederer stated that this action will be explained to the Delegates when the budget is presented to the CD. A motion that the amended finance report be accepted approved (*see p.28*).

XIII. Resolutions

The proposed resolutions were discussed one by one and reviewed for intent, appropriateness, preciseness of wording and content. Two resolutions of the draft submission were deleted; the EC requested the President prepare instead a letter of appreciation to the Canadian Government about the establishment of the Yellowknife Magnetic Observatory, and a letter of thanks to the Soviet Geophysical Committee for the organization of the Workshop on Solar Wind Studies. Another resolution was deleted as inappropriate in intent for the subject of a resolution. Two other resolutions were referred back to the originators for clarification of language. Roederer stated that he would rearrange the order of the remaining resolutions in order to group according to subject areas.

Roederer reminded the EC that some matters had arisen at previous EC meetings which might be translated into resolutions, namely the continued support by the Union of SCOSTEP which has now become a Scientific Committee; the representation on the Union Council which does not adequately reflect the strong activity in IAGA disciplines in countries where this is the case; and that it might be desirable to focus IUGG attention on the need for continued support of basic research. A lengthy discussion ensued about these matters, with Cole commenting that

the statistics of the Union Council representation should be brought to the attention of the national bodies and should be an IUGG resolution. On a resolution about basic research, Roederer prepared draft resolutions for review by the EC.

Later when the final draft of resolutions was discussed again just before the second CD, Gadsden related matters arising from the resolutions: two letters need to be written by the President in lieu of the proposed resolutions; a request from the Interdivisional Commission on History would be deferred to the next EC meeting; concerning J. W. King's request for a resolution: the EC agreed to make this into a resolution proposed by the EC which would be presented to the CD.

XIV. Information on the Fourth General Scientific Assembly in Edinburgh, 3-15 August 1981

Fukushima reported that a local organizing committee had already been established for the Edinburgh Assembly and informed that this committee had written to him, asking for a loan from IAGA. Gadsden explained that this money was needed to go ahead with the printing and preparation of the Circulars and that it would be repaid to IAGA after recovery from registration fees. After a thorough discussion, agreement was reached that IAGA would advance \$2,000 for the printing of the First Circular, and that the situation would be reviewed again at the next IAGA EC meeting.

As to the scientific programs for the Edinburgh Assembly, the proposals from Division leaders were thoroughly reviewed. Some Divisions proposed quite a number of sessions despite the preliminary allotment of 10-14 half-day sessions per Division. Division I proposed parallel sessions without causing conflict of interest within the Division. Regarding Division III, it was agreed to add a Symposium on Planetary Magnetospheres and a Symposium on the Voyager Saturn flyby, in order to meet the proposal from the U. K. National Committee and to note that COSPAR could well sponsor the Saturn symposium because of no COSPAR meeting in 1981. It was also noted that the proposals from Divisions I and V on the use of MAGSAT results would be more effective if they combined.

Some discussion ensued about how to proceed with the proposed programs. Troitskaya proposed that the Conference of Delegates should be told that the EC agrees in principle with the proposed sessions, but that specific details of overlap, cosponsorship and precise session titles will have to be worked out later by the new Program Committee.

XV. Other Business

Roederer reported that Rostoker had declined the appointment offered by the IUGG EC as alternate IUGG Representative to COSPAR. After some discussion, the EC agreed that Roederer should be designated in such capacity. Melchior will be notified of this decision (note: the IUGG Executive Committee later appointed Roederer principal IUGG Representative; no alternate was designated).

The additional nominations for Division leadership were reviewed and approved. Discussion again ensued about the poor geographic distribution in Divisions I and III. Gadsden commented that in the case of Division I, the selection of the Working Group leadership reflected rather a parochial attitude. Alldredge pointed out that the Bylaws as they stand empower the Divisions to elect their own Working Group leadership.

Roederer continued with the review of changes in structure and of the topics submitted by the Divisions. There was some discussion about proposing a change in the By-Laws to require approval by the EC of Division structure, in order to rectify the problem of inadequate geographic distribution of working group leaders. It was agreed that not much could be done to change the present slate, except to add some key members and thereby improve the geographic distribution. Roederer again suggested that the new EC may seriously wish to consider a change in Bylaws to address this problem. Furthermore, he said it would be pointed out to the Division leaders that one person should not hold 2 offices within the same Division. The size of working group or commission membership was also discussed, and this may be considered at the EC meeting in 1980.

Roederer stated that Fukushima had requested the appointment of an assistant to deal with financial matters in the Secretary's absence and empowered to deal with the IAGA Account in Tokyo (but always under the direction of the President). It was agreed to appoint T. Oguti as requested.

Possible dates for the next EC meeting were discussed. Cole stated that Dessler would arrange a suitable place in the US, and this was approved. The tentative dates would be 2-3 days at the end of October 1980.

After thanking all EC members for their hard work during these past two weeks of Assembly, Roederer declared the 1979 meeting of the IAGA Executive Committee closed.

MINUTES OF THE IAGA EC MEETING WITH DIVISION LEADERS

I. Meeting on 3 December, 1215-1345

Division leaders present: B. A. Tinsley, C.-G. Fälthammar, K. I. Gringauz, H. B. Garrett (for E. J. Chernosky).

Roederer welcomed the Division leaders. The purpose of the meeting was to discuss the scientific leadership of the Divisions and Commissions during the next four-year period. He asked the Division leaders to report on their candidate nominations. He reminded everyone that the final slate would be reviewed by the Executive Committee in executive session to ensure as fair a geographic distribution as possible, that the EC may add names by executive action, and that final ratification must come from the Conference of Delegates.

The Division chairmen reported on their lists of candidates; the Secretary General reported for Divisions I and V whose leaders were not present, but whose recommendations he had received in writing.

The list of candidates was discussed at length. Roederer requested comments from all present concerning their knowledge of the candidates and how they would fit into the desired geographic and discipline distribution. The final slate of candidates agreed upon in executive session by the EC for presentation to the Conference of Delegates at the Plenary Session on Monday, 3 December, at 2 p.m. was as follows:

Division I	D. I. Gough (Canada)—Chairman N. V. Pushkov (USSR)—Vice-chairman one more to be named later
Division II	H. Rishbeth (UK)—Chairman M. H. Rees (USA)—Co-chairman P. Bauer (France) " A. D. Danilov (USSR) "
Division III	G. Rostoker (Canada)—Chairman A. Nishida (Japan)—Co-chairman R. G. Rastogi (India)—" M. I. Pudovkin (USSR)—"
Division IV	H. Rosenbauer (FRG)—Chairman T. Gombosi (Hungary)—Co-chairman L. F. Burlaga (USA)—"
Division V	C. Sucksdorff (Finland)—Chairman three co-chairmen to be named later

The additional Vice-chairman and three co-chairmen must be named by the Division leaders of Division I and V respectively. These additional names will be presented to the Conference of Delegates at the second plenary session for ratification by the Chief Delegates. [Remark: The EC approved later the request from Division I that it needs three vice-chairmen to cover the wide subjects of Division I.]

There was not sufficient time left to discuss the candidates for the Inter-Divisional Commissions and Working Groups. Roederer asked Garrett to consult with his colleagues in the Interdivisional Commission on History and prepare a list of candidates. It was agreed to ask other Interdivisional Body leaders to show the candidates of new leaders at a subsequent EC meeting before the second Conference of Delegates.

II. Meeting on 12 December, 0830-1015 and on 14 December, 0800-1000

These meetings were held with the attendance of the new and old chairmen of IAGA Divisions and Interdivisional Bodies. The attendants except EC members are: K. M. Creer, D. I. Gough, B. A. Tinsley, H. Rishbeth (on 12 only), K. I. Gringauz (on 12 only), C. Sucksdorff, L. K. Megill (on 12 only), T. Nagata (on 12 only), E. J. Chernosky (on 14 only), H. B. Garrett (on 12 only), S. R. C. Malin, and D. A. Valencio (on 12 only).

After welcoming the new and old Division and Interdivisional Commission chairmen, Roederer stated that the purpose of this meeting was for the new leaders to become acquainted with the EC, its operations, philosophy, and its relationship with the Divisions and Commissions. Under the new structure of IAGA, the Divisions and Commissions are the scientific backbone of the Association and the role of the EC is to provide the necessary administration, trying to keep to a minimum the interference in the scientific affairs of the Divisions. The EC must, however, ensure that equilibrium is achieved within the Divisions and Commissions in the selection of representatives, disciplines and topics for symposia. Sometimes this requires executive action that may not please the Divisions and Commissions. Roederer reminded the Division leaders that IAGA is an international Association, that there is competition between Divisions, between Associations and between countries. Except for financial matters, within the IAGA all are equal, no matter how small or large the scope of scientific activity in a given country. The Association must serve equitably constituents with a tremendous variety of scope and scientific expertise. Roederer then stated the agenda items for the joint meeting:

(1) Division Chairmen's comments on the mechanics of the Canberra Assembly; (2) proposed topics for the Edinburgh Assembly; (3) budgeting for special projects; and (4) some long-term business of the Association. However, because of the time restriction, the discussion was limited to the items (1) and (2).

1) *Comments on the mechanics of the Canberra Assembly*

Gringauz stated that no papers or symposia had been scheduled on cold plasmas in the space. Roederer commented this might indicate there were no relevant results to report. Gringauz did not concur and responded that this topic should be specifically selected for a future meeting. A brief discussion ensued about the desirability of the selection of specific and

restricted topics for IAGA scientific sessions. General consensus was that this was desirable, provided that sufficient time was left for general contributions. Roederer stated that the EC would take note of Gringauz' remark concerning cold plasmas.

Garrett commented that the poster sessions were poorly organized, in that no specific time or place had been scheduled. Comments ensued with a general consensus emerging that it would be desirable to set aside a specific time, during the day, for these sessions. Roederer remarked that in many countries poster sessions are still considered "second rate" presentations, which is not the case at all. Garrett continued that he had found no organized system for distribution of preprints. Rishbeth responded that it was a good feature of IAGA that no preprints were required from the authors. Garrett further stated that the lack of papers in the History Commission was due to not being able to find a journal willing to publish such articles. Troitskaya recommended that he get in touch with Powsner who is editor of such a journal in the USSR.

A discussion then ensued about how to handle cancelled papers and how much time shifting in the schedule could be allowed. General consensus was that the schedule should be adhered to with no more than a 5-minute shift and that the extra time could be used for discussion. Gough stated that his Division had used late papers to fill in the gaps, but Roederer responded that acceptance of late papers should be discouraged as much as possible. Tinsley stated that the rule permitting only authors or co-authors to read papers was inhibitive; however, Roederer responded that this was a Union rule and that it had been made for specific reasons to avoid that one person would read a number of papers, without being able to comment on them with any expertise.

In conclusion of this item, Roederer encouraged the Division and Interdivisional Commission leaders to prepare a summary of their constructive criticism on the mechanics of the Canberra Assembly, so that these could be taken into account by the EC for the Edinburgh meeting.

2) *Proposed Topics for Edinburgh*

The Division leaders presented in turn their proposed schedule and request for time allocation. These were discussed at great length and were considered later by the EC in executive session.

Roederer reminded everyone that, as in the past, the Scientific Assembly Program Committee will be chaired by the Secretary General; during the 1980 EC meeting, the EC will then become the Program Committee for just a few days, during which time the final schedule will be defined. Scheduling the sessions with minimum overlap or conflict usually proves to be a very difficult task. Division chairmen should set up their programs keeping this clearly in mind. When appointing conveners, care must be taken to select persons who will actually do the work intended for them. The Secretary General will send out instructions and rules about the sessions, the presentations and other details.

Roederer explained that it would be useful to go over the proposed program of each Division and talk about overlap. Roederer also reminded everyone that a 2-3 sentence description must be prepared for each session and submitted to the Secretary General.

Roederer then briefly read the proposed programs and commented on the recommendations made by the EC concerning the improvement of some titles, the addition of symposia in Division III, and concerning some obvious overlaps. After he excused himself to attend an IUGG Executive Committee meeting, the discussion was continued and chaired by

Program Committee Chairman Fukushima.

Fukushima asked all Division leaders to write their proposed programs on the blackboard for simultaneous overview. This was done. Some titles were changed where the subject was not entirely clear; some overlaps were eliminated, and some joint sessions were determined.

In conclusion the scheduling of the deadlines were discussed. IAGA News #18, scheduled for publication in February 1980, will show session titles only. Gadsden indicated it is planned to enclose a limited version of the First Circular on the Edinburgh meeting in IAGA News #18. The Second Circular is scheduled for October 1980. IAGA News #19 is scheduled for publication in November/December 1980 and will contain conveners' explanations and the deadline for submission of abstracts, which was provisionally determined as March 31, 1981.

Fukushima indicated that he would prepare a master matrix showing detailed time scheduling. He took note of several Division requests for preferred timing of certain sessions and linkage with others. He stated that this matrix would be available within some weeks, and the meeting was closed.

MINUTES OF THE JOINT IAGA/IAMAP EC MEETING

12 December, 1979, 1930-2045, University House, Canberra

Present:	IAGA:	L. Aldredge	IAMAP:	A. Belmont
		V. Bucha		A. Dyer
		K. Cole		W. Godson
		N. Fukushima		P. Goldsmith
		M. Gadsden		S. Hess
		J. Roederer		W. Hitschfeld
		V. Troitskaya		K. Isono
				C. Junge
				R. Newell
				S. Ruttenberg

Junge invited Roederer to open the meeting. Roederer related some of the history of the two Associations' efforts to cooperate, adding that this was the second joint EC meeting and expressing his hope that such meetings would become common practice. Referring to Professor Junge's recent presidential address, he stressed that the strong interdisciplinary activities of both Associations make this cooperation beneficial in many areas where the interests of both Associations overlap. Our functions should be cooperative, rather than competitive: what is one Association's "input" or "boundary condition," is the others "output." Cooperation should go beyond that of planning joint Symposia. International research programs such as MAP are an important area of joint endeavour. Other areas for possible cooperation are in the study of atmospheric electric fields, electromagnetic waves at lower altitudes in the low frequency range, and planetary atmospheres. Roederer recalled that a joint Advisory Body had been set up for MAP at the last joint IAGA-IAMAP EC meeting, and noted the lack of representation of ICMUA in that Advisory Body. He informed those present that the IAGA EC had decided to invite IAMAP to add an additional member to that Body as the representative of ICMUA.

Junge responded that this was the spirit of cooperation he had hoped for, and stated that every attempt would be made to keep it that way. He continued that the joint organizing committee for the MAP Symposia in Edinburgh and Hamburg would come up with a program which will satisfy everyone and reiterated that there are three broad areas for cooperation, namely the middle atmosphere, the upper atmosphere and planetary atmospheres. Roederer stated that he would ask Division II leader Rishbeth to keep close contact with IAMAP, especially in relation to the Edinburgh/Hamburg meetings. Roederer and Ruttenberg gave a brief account of the topics provisionally planned for these assemblies.

It was agreed that the IAGA/IAMAP Joint Coordinating Committee would be the Joint Program Committee for the Symposium on Middle Atmosphere Science, Part I of which will be at Edinburgh, Part II of which will continue at Hamburg. There was also agreement that, in

view of the different structure of IAGA and IAMAP, IAMAP could be represented by 4 people (Radiation, Ozone, Atmospheric Chemistry and Upper Atmosphere Commission); it was also agreed, at least in principle, that the IAGA Division II, Division III and Interdivisional Commission on Middle Atmosphere Chairmen could, if so desired, appoint their representative to the Joint Program Committee.

Ruttenberg reiterated that IAMAP would present in its newsletter information on IAGA meetings so that, in the areas of joint efforts, the people will know what is going on. Likewise, notification of IAMAP events will occur in IAGA News. After a brief discussion, it was decided that in connection with the IAGA and IAMAP Scientific Assemblies in 1981, the two Secretaries General would explore the possibility of a joint EC meeting during that time.

Roederer then turned to IAGA resolutions of possible interest to IAMAP. He read the resolution concerning SCOSTEP (IAGA Resolution No. 2). Junge commented that this resolution would indeed be in the interest of IAMAP and offered to bring this matter up at their Plenary Session. Roederer then read the IAGA resolution concerning representation in the IUGG Executive Committee and the IUGG Council (IAGA Resolution No. 1). General comments indicated that IAMAP also suffers from an inequitable representation in the IUGG administration. Ruttenberg offered to inform the IAMAP National Correspondents about this problem and Junge agreed that this matter would be discussed within IAMAP. Roederer then read the resolution proposed as an IUGG resolution on the support of basic research (IAGA Resolution No. 17). Junge agreed that this resolution should be submitted to IUGG as a joint one and indicated that he would bring this up at the IAMAP Plenary Session.

Roederer thanked all present for attending this joint EC meeting and expressed the IAGA EC's gratitude to IAMAP for hosting this joint meeting.

Resolution of Thanks

IAGA expresses its gratitude to those member countries that in recent years have hosted international conferences in the fields of IAGA's interest. IAGA expresses its deep appreciation to the Australian Academy of Sciences and to the Local Organizing Committee of the quality of the arrangements and the hospitality shown to the participants that have led to productive and pleasant meetings in Canberra and Melbourne.

Resolutions

1) IAGA, noting with satisfaction that there are many IUGG member countries carrying out strong scientific programs in IAGA disciplines thus providing a large and important scientific input to IAGA Scientific and General Assemblies, recognizing that the most crucial financial decisions directly affecting the operations of IAGA as well as many programmatic decisions are in the purview of the IUGG Bureau, the IUGG Finance Committee and, ultimately, the IUGG Council, encourages the IAGA Adhering Bodies to promote within the IUGG National Committees to which they belong, the appointment of Delegates to the IUGG Council drawn from the disciplines of IAGA, so as to achieve a representation of IAGA interests in the Council, and ultimately in the IUGG Bureau and Finance Committee, that is commensurate with the actual volume of scientific and programmatic work carried out by this Association.

2) IAGA, noting that SCOSTEP was converted by ICSU into a Scientific Committee, and taking into account the continued strong interest and active participation of IAGA and IAMAP scientists in SCOSTEP programs such as MAP, the IMS Data Analysis phase, SMY, and Solar-Weather Relationships, recommends to IUGG endorsement of the new Constitution drafted for SCOSTEP, and provision of continued financial support to this Scientific Committee.

3) IAGA acknowledges the major contributions to the success of the International Magnetospheric Study that have been made by the IMS Satellite Situation Center (SSC) and by the IMS Central Information Office (IMSCIE); notes that during the post-IMS period there will be a continuing need for an information flow of the type at the present being provided by the SSC and the IMSCIE Office; and urges SCOSTEP and its affiliated international bodies to persuade relevant national agencies and academies to provide continued support to these services during the next decade.

4) IAGA, recognizing the contributions that have been made in the past by experiments on geosynchronous applications satellites, urges that provision be made for the inclusion of coherent radio beacons and other equipment for geophysical experiments when such satellites are being planned.

5) IAGA, noting the success of radar techniques in providing new information about the dynamic and spatial structure of electric fields, and the importance of such information for increasing the understanding both of the ionosphere-magnetosphere coupling and of global energy dissipation in the ionosphere through joule heating, urges that member nations collaborate in establishing radar systems in both hemispheres over as wide a longitude range as possible.

6) IAGA, noting the progress which has been achieved in the investigation of dynamical processes in the upper atmosphere by means of the meteor radar method (especially under the auspices of the IAGA Global Radio Meteor Wind Studies Project (GRMWSP)), and the progress in the development both of automated meteor radars and of mathematical simulation of meteor phenomena, and noting that the necessity of measuring mesopause dynamics on a global scale requires the comparison of data measured by different equipment using different analyses, recommends (i) that all groups which use the radio meteor method during the preliminary MAP period coordinate their efforts in the development of the global network of meteor wind radars, to include transportable radars; (ii) that other techniques (for example, incoherent scatter, partial reflection drifts and LF spaced receiver drifts) should be used in coordinated measurements; (iii) that the existing GRMWSP network carry out simultaneous observations during periods of particular meteorological significance, at least until completion of MAP; and (iv) that greater efforts be made to standardize equipment and analysis techniques, with particular emphasis on comparing results obtained using different observational techniques

7) IAGA, noting that a comprehensive study along an east-west profile of geomagnetic secular variations recorded in sediments deposited since the last glaciation in lakes is likely to yield new data basic to our understanding of the origin of the geomagnetic field and that such a profile would be optimally located in the Eurasian and American continents, within a band of latitudes between 40° and 50°N, recommends that National Bodies in the respective countries support the preparation of a cooperative project in which standardized techniques will be used.

8) IAGA, considering the importance of establishing and maintaining an adequate geographical distribution of magnetic observatories, urges the establishment of an observatory on Easter Island, appeals to the authorities concerned to maintain an electromagnetic noise-free area around the Pamatai (Tahiti) observatory site, and the opening of a permanent magnetic observatory on Amsterdam Island.

9) IAGA, considering the need for secular change data of the magnetic field from remote ocean areas and the possibility of achieving this by measurements at certain specified islands, urges the responsible authorities both to establish the following repeat stations and to re-observe at them at intervals of not more than 5 years:

Atlantic Ocean: Ascencion, St. Helena, Cape Verde, Tristan da Cunha, Trindade
Falkland, Gough, Bermuda;

Pacific Ocean: Clipperton, Galapagos, Juan Fernandez, Line, Marquesas, Gambier
Austral, Marshalls, Carolines, Wake, Baker, Adak, Raoul, Auckland Island,
Campbell, Snares, Cooks, Fiji, Niue, Chatham, Bounty, Antipodes, Tonga,
Solomons, Nauru, New Caledonia, New Hebrides.

Indian Ocean: Heard, Diego Garcia, Seychelles, Maldives, Cocos, Christmas,
Amsterdam Island.

10) IAGA, recognizing the value of the MAGSAT geomagnetic measurements, urges the continuing support of the geomagnetic observatories and measurements at repeat stations to maintain the high precision of world magnetic charts and recommends that, until the end of 1980, observatories send hourly values (preliminary values, if need be) to the World Data Centres not later than two months after the end of the recording period.

11) IAGA, recognizing the importance of rapid run magnetograms for global studies of ULF pulsations, recommends that observatories operating rapid-run magnetometers continue to do so, where possible increasing the sensitivity, and that other observatories initiate rapid-run recording.

12) IAGA draws attention to the desirability of digital magnetic observatories using a sampling rate no slower than once every 10 seconds and asks these observatories to send these data to the World Data Centres as one-minute means (with clear identification of the method of averaging). These means should be centred on the minute (e.g. the first value within an hour is labelled 00^h01^m and is the mean calculated from 00^h00^m30^s to 00^h01^m30^s).

13) IAGA, considering the need of some magnetic observatories to compare their horizontal intensity standard with the international standard and recalling the availability of the standard QHM's which are owned by IAGA and maintained by the Danish Meteorological Institute, urges the magnetic observatories to make use of this facility by requesting loan of the standard QHM's from that Institute.

14) IAGA, recognizing the immense value to the scientific community of the publication of AE-indices by World Data Center A, urges all contributing northern hemisphere observatories to use digital recording and further urges observatories to maintain the necessary data flow, and further recommends all World Data Centers to participate; particularly of importance is the digitisation of magnetograms by WDC-C2 (Kyoto, Japan).

15) IAGA, noting that standards of K-index scaling can change, urges that each country appoint a qualified scientist to check regularly the K-index scalings at all the observatories within that country to maintain these standards and requests that Observatory Directors notify the Central Km-Bureau (Institut de Physique du Globe, Paris) of any changes of the Chief Observer at the Km Observatories to allow the Central Km-Bureau to be alert to detect possible systematic changes in K-scaling.

16) IAGA, considering the interest in global magnetic anomalies and that a certain number of countries have already completed maps on a scale of 1:2 500 000, urges the compilation of such maps within the next four years as a contribution to a global magnetic anomaly map.

17) IAGA, recognizing the ever-increasing pressure upon geophysicists to provide fast returns in the form of practical applications of their research, draws attention to the fact that basic research motivated by intellectual curiosity is the most effective breeding ground for the long-term development of applications in resource exploration and exploitation, environmental protection, and new technologies; urges its member countries to provide continued strong support of basic research in the geosciences, and encourages them to embark in a concerted effort towards establishing an appropriate balance between the current opportunities offered in basic research and the long-term needs in applied fields and technology.

Remarks: Resolution 2 is adopted also by IAMAP. Resolution 17 is adopted also as an IUGG Resolution.

RESOLUTIONS AIGA DE L'ASSEMBLEE DE CANBERRA

(adoptées le 13 décembre 1979)

Résolution de remerciements

L'AIGA exprime sa gratitude aux pays membres qui ont récemment accueilli des conférences internationales sur des sujets intéressant l'AIGA. L'AIGA exprime à l'Académie Australienne des Sciences et au Comité d'Organisation local sa profonde reconnaissance pour l'excellence des dispositions pratiques et l'accueil réservé aux participants, conditions qui ont conféré aux réunions de Canberra et Melbourne un caractère à la fois agréable et fécond.

Résolutions

- 1) L'AIGA, notant avec satisfaction que de nombreux pays membres de l'UGGI mènent à bien d'ambitieux programmes scientifiques dans les disciplines relevant de l'AIGA et contribuent ainsi par des résultats scientifiques nombreux et importants aux assemblées scientifiques et générales de l'AIGA, reconnaissant que les décisions financières les plus cruciales qui affectent directement les opérations de l'AIGA, ainsi que de nombreuses décisions sur les programmes, relèvent du Bureau de l'UGGI, du Conseil financier de l'UGGI, et, en dernier ressort, du Conseil de l'UGGI, encourage les organismes adhérents de l'AIGA à promouvoir au sein des comités nationaux de l'UGGI auxquels ils appartiennent la nomination au Conseil de l'UGGI de délégués issus des disciplines de l'AIGA, afin qu'ils réalisent dans ce Conseil, et finalement dans le Bureau et le Comité des finances de l'UGGI, une représentation des intérêts de l'AIGA qui soit en rapport avec le volume réel de travaux scientifiques et d'organisation menés à bien par cette association.
- 2) L'AIGA, notant que le SCOSTEP a été transformé par le Conseil International des Unions Scientifiques (CIUS) en un Comité Scientifique, et tenant compte du fait que les scientifiques de l'AIGA et de l'AIMPA continuent à porter un profond intérêt et participent activement aux programmes du SCOSTEP tels que le Programme d'Atmosphère Moyenne, (MAP), la phase d'Analyse des Données de l'Etude Internationale de la Magnétosphère (IMS), l'Année du Maximum Solaire (SMY) et les relations Soleil-Climat, recommande à l'UGGI d'approuver la nouvelle constitution préparée pour le SCOSTEP, et de prévoir un soutien financier durable pour ce Comité Scientifique.
- 3) L'AIGA constate les contributions majeures au succès de l'Etude Internationale de la Magnétosphère apportées par le Centre de Situation des Satellites (SSC) et par le Bureau Central d'Information de l'IMS (IMSCIE) ; note qu'après l'IMS il sera toujours nécessaire d'assurer une circulation de l'information telle que celle organisée actuellement par le SSC et le bureau de l'IMSCIE ; et demande instamment au SCOSTEP et aux instances internationales qui lui sont affiliées de persuader les agences et académies nationales concernées de poursuivre leur aide à ces services durant la prochaine décennie.

4) L'AIGA, reconnaissant les contributions qui ont été apportées par des expériences embarquées à bord de satellites géosynchrones d'applications, demande instamment que des dispositions soient prises pour inclure des radio-balises cohérentes et d'autres équipements d'expérimentation géophysique dans les projets de tels satellites.

5) L'AIGA, notant le succès remporté par les techniques radars dans l'obtention de résultats originaux sur la structure spatiale et dynamique des champs électriques, et l'importance de ces résultats pour l'amélioration de la compréhension du couplage ionosphère-magnétosphère et de la dissipation globale d'énergie dans l'ionosphère, demande instamment aux nations membres de collaborer pour établir des systèmes radar dans les deux hémisphères sur un intervalle de longitudes aussi grand que possible.

6) L'AIGA, notant les progrès réalisés dans l'étude des processus dynamiques dans la haute atmosphère à l'aide des radars météoriques (en particulier sous les auspices du Programme Global d'études des vents par mesures radio-météoriques (GRMWSP) de l'AIGA et les progrès réalisés dans le développement de radars météoriques automatiques et de méthodes mathématiques de simulation des phénomènes météoriques, notant également que la nécessité d'appréhender la dynamique de la mésopause sur une échelle globale suppose la comparaison de données mesurées par différents instruments avec différentes méthodes de dépouillement, recommande (i) que tous les groupes utilisant la technique radio météorique durant la période préliminaire de MAP coordonnent leurs efforts de développement du réseau global de radars météoriques, en y incluant des radars transportables ; (ii) que d'autres techniques (par exemple la diffusion incohérente, et les mesures de dérives par réflexion partielle et par récepteurs basse fréquence espacés) soient utilisées dans des campagnes de mesures coordonnées ; (iii) que le réseau existant du GRMWSP effectue des observations simultanées pendant les périodes d'intérêt météorologique particulier, au moins jusqu'à l'achèvement de MAP ; et (iv) que des efforts plus importants soient faits pour normaliser l'équipement et les techniques d'analyse, en insistant sur la comparaison de résultats obtenus par des techniques différentes et observation.

7) L'AIGA, notant qu'une étude exhaustive le long d'un profil est-ouest des variations géomagnétiques séculaires enregistrées dans les sédiments déposés dans les lacs depuis la dernière glaciation est susceptible d'apporter de nouvelles données fondamentales pour notre compréhension de l'origine du champ géomagnétique et qu'un tel profil serait localisé de façon optimale sur les continents Eurasien et Américain, à l'intérieur d'une bande de latitudes s'étendant de 40° à 50° N, recommande que les instances nationales dans les pays respectifs apportent leur soutien à la préparation d'un projet coopératif mettant en jeu des techniques normalisées.

8) L'AIGA, considérant l'importance de l'établissement et du maintien d'une distribution géographique adéquate d'observatoires magnétiques, demande instamment qu'un observatoire magnétique soit établi sur l'île de Pâques, que les autorités concernées maintiennent une zone de calme électromagnétique autour de l'observatoire de Pamatai (Tahiti), et qu'un observatoire magnétique permanent soit ouvert sur l'île Amsterdam.

9) L'AIGA, considérant le besoin de données de variations séculaires du champ magnétique en provenance de régions océaniques difficilement accessibles, et la possibilité de satisfaire ce besoin par des mesures sur certaines îles spécifiées, demande instamment aux autorités responsables, d'une part d'établir les stations de répétition suivantes, et d'autre part d'y répéter les observations tous les cinq ans au moins :

Océan Atlantique : Ascension, Ste Hélène, Cap vert, Tristan de Cunha, Trinité, Falkland, Malvinas, Gough, Bermudes.

Océan Pacifique : Clipperton, Galapagos, Juan Fernandez, îles de la Ligne (Sporades équatoriales), Marquises, Gambier, îles Australes (Tubuái), Marshall, Carolines, Wake, Baker, Adak, Raoul, îles Auckland, Campbell, Snares, Cook, Fidji, Niue, Chatham, Bounty, Antipodes, Tonga, Salomon, Nauru, Nouvelle Calédonie, Nouvelles Hébrides.

Océan Indien : Heard, Diego Garcia, Seychelles, Maldives, Cocos, Christmas, île Amsterdam.

10) L'AIGA, reconnaissant la valeur des mesures géomagnétiques de MAGSAT, demande instamment que soit maintenu le soutien aux observatoires géomagnétiques et aux mesures aux stations de répétition pour conserver la haute précision des cartes magnétiques mondiales et recommande que, jusqu'à la fin de 1980, les observatoires envoient des valeurs horaires (préliminaires, si nécessaire) aux Centres Mondiaux de Données dans un délai de deux mois au plus après la fin de la période d'enregistrement.

11) L'AIGA, reconnaissant l'importance des magnétogrammes à haute résolution temporelle pour les études des pulsations UBF, recommande que les observatoires disposant de magnétomètres à cadence rapide poursuivent leurs observations, en accroissant dans la mesure du possible la sensibilité de leurs instruments, et que d'autres observatoires entreprennent des enregistrements à cadence rapide.

12) L'AIGA, attire l'attention sur l'intérêt de disposer d'observatoires magnétiques fournissant des données numérisées avec une cadence d'échantillonnage inférieure à 10 secondes et demande à ces observatoires de faire parvenir ces données moyennées sur une minute, aux Centres Mondiaux de Données (en indiquant clairement la méthode utilisée pour l'obtention de la moyenne). Ces moyennes doivent être centrées sur la minute (par exemple la première valeur de l'intervalle horaire est intitulée 00 H 01 mn et correspond à la moyenne calculée entre 00 H 00 mn 30 s et 00 H 01 mn 30 s).

13) L'AIGA, considérant la nécessité pour certains observatoires magnétiques de comparer leur étalon d'intensité horizontale à des étalons internationaux et rappelant que sont disponibles des QHM étalons propriété de l'AIGA et entretenus par l'Institut Danois de Météorologie, encourage vivement les observatoires magnétiques à utiliser ces QHM étalons en sollicitant le prêt auprès de cet institut.

14) L'AIGA, reconnaissant l'apport essentiel à la communauté scientifique que constitue la publication des indices AE par le Centre Mondial de Données A, demande instamment à tous les observatoires magnétiques de l'hémisphère nord qui contribuent à l'établissement de ces indices de se doter de moyens d'enregistrement numériques, demande instamment aux observatoires de maintenir le débit d'enregistrement nécessaire, et recommande enfin une participation de tous les Centres Mondiaux de Données ; la numérisation des magnétogrammes par le WDC-C2 (Kyoto, Japon) est, en particulier, d'importance primordiale.

15) L'AIGA, notant que les règles suivies pour établir les indices K sont susceptibles d'évoluer, demande instamment à chaque pays de désigner un scientifique compétent chargé de vérifier régulièrement les mesures des indices K dans tous les observatoires de son pays afin de maintenir le mode de mesure conforme aux normes établies et demande aux directeurs d'observatoires de signaler au bureau central des Km (Institut de Physique du Globe, Paris) tout changement d'observateur principal dans un observatoire Km afin de permettre au bureau central des Km d'être en mesure de détecter d'éventuelles variations systématiques dans la mesure des indices K.

16) L'AIGA, considérant l'intérêt des anomalies magnétiques globales et considérant qu'un certain nombre de pays ont déjà réalisé des cartes à l'échelle de 1:2 500 000, demande instamment que soit réalisé l'inventaire de telles cartes dans un délai de 4 ans à titre de contribution à l'établissement d'une carte globale d'anomalies magnétiques.

17) L'AIGA, constatant que les géophysiciens sont appelés de manière de plus en plus pressante à dégager rapidement des retombées pratiques de leurs travaux de recherche, attire l'attention sur le fait que la recherche fondamentale motivée par la curiosité intellectuelle est le terrain le plus fertile pour le développement à long terme des applications dans les domaines de l'exploration et de l'exploitation des ressources, de la protection de l'environnement et des technologies nouvelles ; demande instamment aux pays membres d'apporter de manière continue un appui solide à la Recherche fondamentale en Géophysique, et les encourage à s'engager dans une action concertée visant à établir un équilibre judicieux entre les possibilités actuelles offertes par la Recherche fondamentale et les besoins à long terme dans les domaines des applications et de la technologie.

Remarque : La résolution 12 est adoptée également par l'AIMPA ;

La résolution 17 est adoptée également comme résolution de l'UGGI.

SELECTED RESOLUTIONS OF THE VXII IUGG GENERAL
ASSEMBLY IN CANBERRA, DECEMBER 1979

RESOLUTION 1

IUGG

Recognizing the ever-increasing pressure upon geophysicists to provide fast returns in the form of practical applications of their research, draws attention to the fact that basic research motivated by intellectual curiosity is the most effective breeding ground for the long-term development of applications in resource exploration and exploitation, environmental protection, and new technologies; urges its member countries to provide continued strong support of basic research in the geosciences, and encourages them to embark on a concerted effort toward establishing an appropriate balance between the current opportunities offered in basic research and the long-term needs in applied fields and technology.

RESOLUTION 2

IUGG

Draws the attention of the member countries on By-Law 4.
Urges the member countries which have not yet done so to establish National Committees for geodesy and geophysics and to appoint National Correspondents for each association.

RESOLUTION 3

IUGG

Taking into account the informal discussions held at the XVII General Assembly between officers of the Union and the delegation of the People's Republic of China.

Invites the incoming Bureau to study the possibility of, and, if appropriate, to recommend changes in the statutes which would permit to admit as members of the Union, adhering bodies necessary for the complete representation of the geodesists and geophysicists of any country

RESOLUTION 4

IUGG

Recognizing the need for National Committees to keep under review international scientific programmes sponsored wholly or in part by IUGG and its component Associations, decides that the IUGG Chronicle should publish an up-to-date list of these programmes once every two years, together with other relevant information.

RESOLUTION 5

Considering that the holding of interdisciplinary symposia and the presenting of Union lectures during the General Assemblies of IUGG are among the most important means to bring scientists of various associations of IUGG together to discuss problems of common interest and to exchange results of research and research methods used in the various fields.

Noting that at some to the past interdisciplinary symposia papers were presented of such a high degree of specializaiton that their contents did not provide the link between scientists of other disciplines and interests.

Noting further that each of the associations should also be enabled to organize symposia in their own field to make the participation in general assemblies of IUGG more attractive.

Decides

- * to continue organizing interdisciplinary symposia and Union lectures at the occasion of future general assemblies.
- * to include more invited papers in interdisciplinary symposia thus emphasizing the need for papers to be presented in such a way that they can be understood by scientists of the participating associations.
- * to organize Union lectures in such a way that each of the IUGG associations gets an opportunity to present a lecture on a topic which may be of general interest to other associations and to ensure that the topic is presented in such a way that the lecture can be understood by participating scientists.
- * to enable IUGG associations to organize, in addition to the interdisciplinary symposia, also timely symposia in their own specific fields.

RESOLUTION 6

IUGG

Recognizing that the International Center for Theoretical Physics (ICTP) in Trieste has begun to play an important role in theoretical geodesy and geophysics.

Expresses its appreciation to UNESCO and I.A.E.A. for the contribution made by the ICTP and

Recommends that the role of the ICTP be expanded in the coming years.

RESOLUTION 7

IUGG

Recognizing that the Geodetic Reference System 1967 adopted at the XIV General Assembly of IUGG, Lucerne, 1967 no longer represents the size, shape and gravity field of the Earth to an accuracy adequate for many geodetic, geophysical, astronomical and hydrographic applications and

Considering that more appropriate values are now available.

Recommends

- a) that the Geodetic Reference System 1967 be replaced by a new Geodetic Reference System 1980, also based on the theory of the theory of the

geocentric equipotential ellipsoid, conventional constants defined by the following equatorial radius of the Earth:

$$a = 6378\ 137\ \text{m},$$

geocentric gravitational constant of the Earth (including the atmosphere)

$$GM = 3986\ 005 \times 10^8 \text{m}^3 \text{s}^{-2}$$

dynamical form factor of the Earth, excluding the permanent tidal deformation:

$$J_2 = 108\ 263 \times 10^{-8}$$

angular velocity of the Earth:

$$\omega = 7289\ 115 \times 10^{-11} \text{rad s}^{-1},$$

b) that the same computational formulas, adopted at the XV General Assembly of IUGG in Moscow 1971 and published by IAG, be used as for the Geodetic Reference System 1967, and

c) that the minor axis of the reference ellipsoid, defined above, be parallel to the direction defined by the Conventional International Origin, and that the primary meridian be parallel to the zero meridian of the BIH adopted longitudes.

RESOLUTION 13

IUGG

Noting the invaluable support provided by UNESCO in the past, particularly by its encouragement of international co-operation to mitigate the risks to mankind from earthquakes, volcanic eruptions and other natural hazards,

Recognizing that the assessment of risks from natural hazards to people's lives, social welfare and economic activity remains of paramount importance,

Recommends that ICSU be invited to encourage UNESCO to implement its plan to establish a Natural Hazards Unit and to promote the Unit's programme in earth sciences and assessment of risk.

RESOLUTION 18

IUGG

Expresses its gratitude to those member countries that in recent years have hosted international conferences in the fields of interest to the IUGG and its seven component associations.

Expresses to the Australian Academy of Science and to the Local Organizing Committee its deep appreciation of the quality of the arrangements and the hospitality shown to the participants that have led to productive and pleasant meetings in Canberra and elsewhere.

RESOLUTION 19

IUGG

Expresses its warmest appreciation for the excellent arrangements for this seventeenth General Assembly to the Australian National University and its Vice Chancellor, Professor Anthony Lowe, who cheerfully and gladly made available the facilities of ANU for the running of this Assembly.

IAGA INTERNAL STRUCTURE AND LEADERS (1979-1983)

EXECUTIVE COMMITTEE

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	Daniel A. VALENCIO,	Departamento de Geología, Ciudad Universitaria, Pabellon 2, 1428 Buenos Aires, Argentina.
	Donald J. WILLIAMS,	Space Environment Laboratory, NOAA/ERL R43 Boulder, Colorado 80303, U.S.A.

At the 1975 Grenoble Assembly, the following Past Presidents were named as Honorary Members: J. Coulomb (France), V. Laursen (Denmark), M. Nicolet (Belgium) and T. Nagata (Japan).

DIVISION I. INTERNAL MAGNETIC FIELDS

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Working Group I-3. Electromagnetic Induction and Electrical Conductivity
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Working Group I-5. Paleomagnetism

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Working Group I-6. Rock Magnetism

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Topic II-1. Structure and Dynamics of the Thermosphere

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Topic II-2. Neutral and Ion Chemistry and Solar Fluxes

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Topic II-3. Atmospheric Quantal Emissions.

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Topic II-4. Ionospheric Small Scale Structures

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Topic II-5. Ionosphere-Magnetosphere Interactions

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Topic II-6. Stratosphere-Mesosphere-Ionosphere Interactions

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Topic II-7. Aeronomy of Other Planetary Atmospheres

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Topic II-8. Laboratory Experiments of Aeronomic Interest

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Topic II-9. Planetary Exospheres

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Topic III-1. Magnetosphere-Ionosphere Interactions.

- Reporter: R.A. WOLF, Department of Space Sciences and Astronomy, Rice University, Houston, TX 77001, U.S.A.

- Topic III-2. Magnetosheath, Magnetospheric Boundary and Plasma Penetration
 Reporter: G. PASCHMANN, Institut für Extraterrestrische Physik,
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- Topic III-3. Distribution and Properties of Magnetospheric Plasmas
 Reporter: K.I. GRINGAUZ, Space Research Institute, Profsoyuznaya 88,
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- Topic III-4. Energetic Particle Populations Including Cosmic Ray Entry.
 Reporter: M. SCHULZ, Space Sciences Laboratory, The Aerospace
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- Topic III-5. ULF Waves
 Reporter: V.A. TROITSKAYA, Institute of Physics of the Earth,
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- Topic III-6. Plasma Waves and Wave Particle Interactions.
 Reporter: D.J. SOUTHWOOD, Physics Department, Imperial College,
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- Topic III-7. Magnetic Storms and Substorms, Including Aurora-Magnetosphere
 Relations.
 Reporter: R.L. McPHERRON, Department of Geophysics and Planetary Physics,
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- Topic III-8. Magnetospheres of Other Planets.
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- Topic III-9. Active Space Experiments, Laboratory Experiments and
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Working Group III-3 Quantitative Magnetospheric Models

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DIVISION IV. SOLAR WIND AND INTERPLANETARY MAGNETIC FIELD

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Topic IV-1. Large Scale Characteristics of the Interplanetary Medium

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Topic IV-2. Waves, Discontinuities and Shocks in the Interplanetary Plasma.

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Topic IV-3. Solar Wind Interaction with Unmagnetized or Weakly Magnetized Bodies

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Topic IV-4. Solar Activity, Interplanetary Dynamics and Terrestrial Disturbances

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Topic IV-5. Evolution of the Sun and Solar System as Deduced from Solar Wind Observations.

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Topic IV-6. Interaction of the Interplanetary Neutral Gases and the Solar Wind Plasma.

Reporters: T.E. HOLTZER*, High Altitude Observatory, NCAR, P.O. Box 3000,
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DIVISION V. OBSERVATORIES, INSTRUMENTS, INDICES AND DATA

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Working Group V-2. Meteor Observatories

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Working Group V-4. Optical Calibration Standards

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Working Group V-5. Magnetic Surveys and Charts

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Working Group V-6. Geophysical Indices

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Working Group V-7. Collection and Dissemination of Data

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Working Group V-10. Ground Based Measurements for Satellite Geomagnetic Surveys

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Topic V-1. Geophysical Alerts and Forecasts

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(Internal structure is now under consideration)

INTERDIVISIONAL COMMISSION ON HISTORY

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EXAMPLES OF THE IMPLEMENTATION OF IAGA RESOLUTIONS OF THE SEATTLE ASSEMBLY

The IAGA Resolutions adopted at the Seattle Assembly in August/September 1977 must have surely been very useful in many respects for a number of IAGA member countries. They will be useful also for future improvement of observation and research facilities and organizations. The discussions held by various IAGA internal Working Groups during the Canberra Assembly were of course based on the present status of observation facilities and research programs, which must have been partially improved in recent years due to the effect of the IAGA Seattle Assembly. For some resolutions we must wait a little longer for their implementation. Some resolutions of the IAGA Canberra Assembly express the necessity for more intensification of world observation, for example, the ground backup observation of the geomagnetic field in association with the MAGSAT mission.

The implementation of the IAGA Seattle resolutions may be well seen in the National Reports from member countries presented at the Canberra Assembly. Before the IAGA Canberra Assembly, the Secretary General received the reports from the National Committees of Australia, Portugal, Spain and Sweden. Although these are only some selected samples of the implementation, the outline of their reports is introduced below.

Resolution No.2 regarding ionosonde network: In Australia the Ionospheric Prediction Service is contacting INAC of URSI for the need of ionospheric data, and a modern ionosonde was installed at Mundaring Observatory to replace the earlier equipment. In Spain the Ebro Observatory will continue to operate the ionosondes at Ebro and Arenosillo in cooperation with the Spanish Committee for Space Research. Sweden is also following this resolution.

Resolution No.3 on the support for rocket and balloon programmes: Sweden is adhering to this Resolution. An Australian-U.S.A. collaboration program for balloon measurement is going on.

Resolution No.6 concerning ELAS: The Australian program in magnetotellurics of the Bureau of Mineral Resources, Geology and Geophysics, is under review, but if it is continued, the value of deep soundings will be kept in mind. The research group in the Australian National University is carrying out an array-observation of magnetic variometers in India to obtain information on the electrical conductivity structure of the Himalayan mountains, and a second array is planned to study induction effects in the south Indian peninsula. In Spain the Instituto Geografico Nacional (IGN) has started special magnetic and magnetotelluric observations, which will be implemented during coming years.

Resolutions Nos. 7 and 8 regarding digital recording: In Australia, both digital and analog recordings are being carried out at Canberra and Guangara Observatories. In Spain the operation of traditional systems of magnetic records will be continued, and the operation of a digital magnetic recording will start soon in Ebro. The effort towards modernization of the equipment is also being made in Portugal.

Resolution No.9 concerning shifts of observatories: This is being applied in Australia to Toolangi and Canberra with repeat station at Essendon aerodrome. In Spain Toledo-San Pablo is the example, and the Resolution will be applied for the possible future shift of San Fernando and Ebro.

Resolution No.10 for the accurate magnetic charts, the observational data from Australia, Portugal, Spain and Sweden are being sent to WDC.

Resolution No.14 on the ground backup for MAGSAT: Spain and Sweden will also contribute to ground-based observation within their territory. In Australia, observations are considered to be carried out at Cocos, Christmas Islands, Heard Island, Papua New Guinea and the Solomons.

Resolution No.16 on magnetic anomaly maps: Bureau of Mineral Resources in Australia produced a detailed map of total intensity residuals but not yet on the scale/projection of the world geological map. BMR will be producing regional residual maps from the third-order survey by automated procedures so that they can be prepared at any scale/projection. In Sweden isoanomaly maps have been produced for internal use. The aeromagnetic survey is in progress in Portugal, which will contribute very much to drawing magnetic anomaly maps in that area.

These are only some examples of the implementation of the IAGA Seattle Assembly, and the readers of the IAGA National Reports or other governmental or organizational reports will notice many other examples of the effectiveness of the IAGA Resolutions in the worldwide network of observations for geomagnetism and aeronomy.

HISTORY OF IAGA

IAGA Resolution No.1 of the Seattle Assembly encourages the communication of relevant information concerning the history of IAGA. The Secretary General is very grateful for such an action, e.g. he received from the U.K. National Geomagnetic Archive the report of the first meeting of IAGA's predecessor organization (Section of Terrestrial Magnetism and Electricity under the International Geodetic and Geophysical Union) in July 1919, which was handed to the U.K. Archive by the widow of the late Dr. J.M. Stagg (Secretary General of IUGG 1945-1953). The IAGA Secretary General thanks also Prof. Emeritus M. Ota for presenting the Transactions of the Rome Meeting (held in May 1922). The Kakioka Magnetic Observatory provided the Secretary General with the copies of the Transactions of IATME Meetings of earlier times. Since the IAGA Canberra Assembly was held in the 60th year after the birth of IAGA, the Secretary General is now trying to include a short summary of IAGA's 60 years development as an appendix in the Transactions of the IAGA Canberra Assembly, with the help of the IAGA Interdivisional Commission on History. A part of the article under preparation is given on pages 121-124 of this IAGA News.

INFORMATION FROM RELEVANT INTERNATIONAL BODIES

SCIENTIFIC COMMITTEE ON SOLAR-TERRESTRIAL PHYSICS (SCOSTEP)

INTERNATIONAL MAGNETOSPHERIC STUDY (IMS)

The SCOSTEP Secretariat issued in October 1979 the Fourth Report on IMS (final Progress and Status Report, 31 pages), which contained Overview and Summary Recommendation

Milestones in the IMS

Summary of IMS Project and Program Coordination

- a. Satellite Situation Center
- b. The IMS Central Information Exchange Office
- c. IMS Workshops

Magnetospheric Research after the IMS

- a. Data Analysis Phase
- b. Transition Period
- c. Long-Term Phase

with Appendices on International Data Analysis Workshop Center, Expected Achievements and Major Outstanding Questions, and other useful information containing tables for IMS-dedicated satellites and a world map of the observation network. The IMS Steering Committee (chairman: J.G. Roederer) showed a brief summary of recommendations as follows.

Post-IMS Data Analysis Phase (4-5 years, starting in 1980)

- Give highest priority to the analysis and interpretation of data.
- Establish an international Data Analysis Workshop Center (DAWOC)
- Continue operation of the IMS Central Information Exchange office (IMSCIE) and distribution of the IMS Newsletter at reduced frequency.
- Maintain operational at least one high-resolution meridional magnetometer chain.
- Continue the operation of ISEE 3 to ensure continued and, if possible, real-time data acquisition on solar wind parameters.
- Provide adequate support to approved experimental programs scheduled for the early eighties such as EISCAT, Dynamic Explorer (DE), Spacelab, MAGSAT, etc.
- In terms of scientific meetings, give highest priority to regional topical symposia, workshops and summer schools on magnetospheric physics.
- Organize one major international symposium on IMS results toward the end of the Post-IMS Data Analysis Phase.

Long-Term Future of Magnetospheric Research (approximately 1985 onwards):

- Develop an experimental program focussing on topics such as: cusp and high latitude boundary layers; the distant tail and the polar cap; auroral zone field-aligned electric fields; anomalous plasma processes, etc.
- Carry out multi-satellite programs such as the proposed OPEN mission (Origin of Plasmas in the Earth's Neighborhood).

In the following pages, "Milestones in the IMS" and "Expected Achievements and Major Outstanding Questions" are picked up and reproduced from the Fourth Report on IMS.

II. MILESTONES IN THE IMS*

- 1976
- IMS begins, January 1.
 - ICSU agrees that the IMS be extended until December 1979.
 - IMS Newsletter introduced; 1700 copies air-mailed monthly by IMSCIE Office.
 - IMSCIE receives manpower support offered by several countries.
 - Special SSC Satellite Periods for first half of 1977 designated; two more SSC reports issued.
- 1977
- Launch of Core-Satellites, GEOS 1 (ESA) and ISEE 1/2 (NASA-ESA).
 - Daily Data Summaries (GEOS 1) and Data Pool Tapes/Plots (ISEE 1/2).
 - Magnetic conjunction predictions between GEOS 1 and low altitude satellites and ground based stations.
 - Publication of Third IMS Report (Progress and Status) and planning for coordinated data analysis by Steering Committee.
 - Directory of Spacecraft and Experiment Scientific Contacts.
 - First special session to look at event data in a coordinated way (Fall AGU, San Francisco).
 - First regional IMS Workshop (Hankalmii).
- 1978
- Launch of Core Satellites GEOS 2 and ISEE 3.
 - Launch of IMS-dedicated satellites Kyokko and Jikiken (Japan) and Mag-1K (USSR-Intercosmos).
 - Formal proposal of IMS Data Analysis Phase 1980-85.
 - ISEE/GEOS ESLAB Symposium (Innsbruck).
 - IMS Working Conference (Innsbruck).
 - First coordinated Data Analysis Workshop (CDAW) (Greenbelt, MD).
 - Several regional workshops conducted.
- 1979
- Launch of final IMS-dedicated Spacecraft Ionosonde-1K (Intercosmos).
 - First IMS International Symposium (Tokyo).
 - Regional workshops and CDAW's held.
 - Proposal of an international Data Analysis Workshop Center.
 - First Symposium on IMS Results (Melbourne).
 - IMS observational phase ends, December 31.

*See Milestones in IMS Organization 1969-75 in Third IMS Report (1977).

EXPECTED ACHIEVEMENTS AND MAJOR OUTSTANDING QUESTIONS

1. Expected Achievements of the IMS

1a. Convection Electric Fields and Three-Dimensional Current Systems

From the IMS data base it appears reasonably sure that the gross electric field configuration in the magnetosphere, particularly in the magnetotail, will be defined. This is of vital importance as it will allow the construction of sensible convection patterns in the nightside magnetosphere--a necessary ingredient in our understanding of the energy transport and dissipation associated with magnetospheric sub-storm activity. Closely allied to the definition of the electric field configuration is the question of the overall three-dimensional current system linking the high latitude ionosphere to the distant magnetosphere. It appears at this time that the vastly upgraded quality of ground-based magnetometer coverage, coupled with magnetic field measurements obtained by dedicated IMS satellites together with various low altitude polar orbiters, will permit a comprehensive global picture of ionospheric and field-aligned currents in the near earth environment to be synthesized. The location and characteristics of the generator regions in the distant magnetosphere will, in all probability, not be observationally confirmed during the period of the IMS. However, the wealth of information on the complete configuration of the currents in the near-earth environment together with our existing knowledge of the particle and field environment in the magnetosphere should permit theoreticians to more effectively evaluate the many potential physical mechanisms which may operate in the various generator regions where the three-dimensional current systems are driven.

1b. Low Latitude Magnetopause and Boundary Layer

One of the major contributions of the IMS is the exploration of the boundary layer that extends almost continuously along the inside of the magnetopause, with substantial variation in thickness, density, plasma flow velocity and spatial stability. It is the low latitude portion of this layer of which we have good reason to expect that, by interpretation of the data obtained with ISEE 1, 2 and through occasional encounters by GEOS 1 and 2, its nature will receive a far-reaching illumination. The most urgent task in this context is the clarification of the role of magnetic merging, a process that in spite of its extensive theoretical treatment has remained controversial. This is mainly due to the disturbing scarcity (so far) of events with plasma signatures that clearly conform to the theoretical expectations. Other properties of the low latitude boundary layer that should become known are the respective plasma contributions from solar wind and ionosphere, local heating processes, gross mass flows and electric current distributions. The plasma wave properties, their generation

and role in achieving anomalous plasma transport are at present under study and promise to become further elucidated. Concerning the shape of the magnetopause, ISEE 1 and 2 are well suited to deduce deformations due to surface waves or turbulent processes. Such waves have since long been suspected to contribute substantially to the momentum and energy transfer from solar wind to magnetosphere.

1c. Origin and Propagation of Pc4-5 Waves

These waves have been detected at the magnetopause boundary (ISEE), in the magnetosphere (GEOS), in the ionosphere (STARE), and on the ground (magnetometer chains). One cannot yet ascertain the respective roles of the solar wind disturbances and of the inner magnetosphere currents in the generation mechanism of these waves. But their polarization and spectral characteristics will be known as a function of latitude, local time and radial distance. The resonant properties of the field lines and the transfer function of the ionosphere will be largely understood.

1d. The Propagation Characteristics of ULF and VLF Waves

The existence of improved techniques for measuring both the E and B components of the electromagnetic field in a wide frequency range, as well as the implementation of ground-based observatories for recording waves at the feet of the field lines passing through magnetospheric satellites, has allowed us to understand the spatial extension, the polarization and propagation characteristics of many natural as well as artificial (ground VLF transmitters, power lines) electromagnetic waves.

1e. Wave Particle Interactions

Simultaneous measurements of the wave field, of the cold plasma parameters (density, temperature, composition) and of the high energy particle distributions (GEOS-ISEE-JIKIKEN) have allowed us to verify theories for the generation of natural waves, both electrostatic and electromagnetic. However, the time resolution of particle detectors is not yet adequate to solve the problem of the fast-growing electrostatic waves. New discoveries concern the common existence of harmonically related ULF emissions above the proton gyrofrequency and the role which is played by the presence of cold He ions in the generation of most of the ULF waves.

1f. Composition of the Low-energy Tail of the Ring Current

With new instrumentation orbited on GEOS 1, 2 and ISEE 1, the composition of the lower energy portion (≤ 17 Kev/q) of the ring current and the plasma environment throughout the magnetosphere to 23 R will be determined. Composition is a very important parameter in determining the origin of such particles; however the composition

of the bulk of the ring current energy density will remain unknown. In addition, the plasma densities outside the plasmasphere have been measured satisfactorily by both active wave and impedance experiments and by low energy particle experiments on GEOS 1, 2 and ISEE 1,2. The temperature of the cold plasma is also determined in these measurements. The complementary nature of the wave and particle experiments will also provide knowledge about the sheath effects around the spacecraft and the validity of the various measurements in each plasma regime encountered within the magnetosphere.

1g. Time Sequence of Events in a Substorm

In past years the understanding of the processes by which interplanetary particle and field changes influence the various types of magnetospheric activity has been severely limited by our inability to be sure of the time at which the magnetosphere and ionosphere start to respond to a given well-defined change in the interplanetary medium. It is confidently expected that such timing problems will be resolved thanks to the significant upgrading of ground-based instrumentation coverage and the ability to resolve spatial and temporal variations in the magnetotail afforded by the ISEE 1 and 2 satellites. Such a development is bound to have an important impact on the study of substorms, as the erratic and localized development of substorm-disturbed region has led, in the past, to controversy and disagreement, largely fostered by the failure of the monitoring arrays to definitively establish the times of the various phases of substorm development.

2. Some Major Questions That Will Remain Unanswered After the IMS

2a. Cusp and High Latitude Boundary Layers

It is fair to say that the role of the magnetospheric boundary layers and the physical processes occurring therein will not be fully revealed through the data collected during the IMS. This is mainly due to a lack of measurements with high temporal resolution on eccentric polar orbiting satellites capable to explore the distant cusp and high-latitude boundary regions. This will, therefore, remain one of the prominent tasks of future magnetospheric research. In these regions much is to be learned about m.h.d. turbulence, eddy convection, and other anomalous plasma processes. As long as the detailed properties of these regions are not understood, we will not be in a position to assess their role as internal generators of electric currents. For the momentum transfer from the solar wind and the gross transport of magnetic flux, it is important to verify the existence or absence of impulsive reconnection and "magnetic erosion" events, which have been postulated on the basis of very limited data sets. With these problems carried to further solution one will also be enabled eventually to assess the role of the cusp regions for the overall mass budget and mass transport of the magnetosphere. This subject comprises the still largely unknown origin of the plasma mantle, its relation to the plasma-sheath, and disturbances of the tail lobes and the polar cap.

2b. The Distant Tail and the Polar Cap

Although the dynamics of the near-earth tail during substorms will be widely investigated using IMS data, it is to be expected that the more distant portions of the tail will remain unexplored for many years. This shortcoming may hold up a full understanding of the substorm, the overall magnetic flux transport, the origin of the plasmashet and the acceleration processes occurring in the tail. One of the most intriguing questions in this context is the extent of closed field-lines in the tail, the existence and motions of an X-type neutral line, and the formation and ejection of plasmoids, i.e., of magnetically isolated regions. Because of the fundamental nature of these processes for the understanding of other astrophysical plasmas, their further experimental study can hardly be overemphasized.

2c. Auroral Zone Field-aligned Electric Fields

While the nature and configuration of convection electric fields is expected to be understood on the basis of analysis of the IMS data suite, the origin and morphology of parallel electric fields, known to exist on auroral zone field lines in the region from the topside ionosphere up to a few thousand kilometers above the earth's surface, will not be adequately addressed using IMS data. It is clear that this gap in our knowledge will militate against our ability to understand the physics of auroral processes, particularly those of a transient nature such as substorms. It will be necessary, in the future, to plan a mission whose task will be to carry out high time resolution studies of the key plasma and field parameters in these vitally important regions of near-earth space.

2d. Anomalous Plasma Processes

Anomalous processes play an essential role in the gross transport of mass, momentum, energy and magnetic flux not only in the magnetosphere, but in virtually all dilute plasmas. Magnetic merging, damping of surface waves, eddy convection, and maintenance of strong potential drops along magnetic field lines probably involve such anomalous transport processes. Their detailed modelling in the geophysical context--guided by comprehensive wave and particle measurements--represents one of the major theoretical tasks of future magnetospheric research.

2e. Composition of the Bulk of the Ring Current Population

In spite of the great advances that are expected to be made through the detailed analysis of the IMS particle data suites, plasma composition measurement must be extended to cover the bulk of the ring current energy density distribution--a distribution which represents one of the two main energy storage systems ($\sim 10^{23}$ ergs) in the magnetosphere. This knowledge is essential for the determination of the origin and cause of the ring current.

2f. Trigger and Development Mechanisms of Substorms

Despite the expected advances in timing of substorm phases and the expected ability to separate spatial and temporal effects in the substorm-disturbed region of the magnetotail, it is highly unlikely that the physical processes which lead to the triggering of substorm activity will be fully understood using the IMS data base. There are at least two obvious reasons for this. Firstly, the acceleration region between the topside ionosphere and altitudes of a few thousand kilometers will not be addressed by the IMS data suite; yet it probably plays an important role in the whole substorm process, as it appears to be a site of acceleration of auroral electrons. Secondly, the clear localization of regions of intense substorm activity, and the rapid temporal and spatial variation of particle and field parameters inside such regions, make the few satellite point measurements relatively ineffectual in determining the large-scale substorm phenomenology in the magnetotail. It may well be true that inherent limitations in the existing techniques for observing substorm variations may make further programs realistically impossible. It can then only be hoped that the theoreticians will be able to use the IMS data to upgrade their models of the substorm process to the point where an optimum model can be agreed on.

2g. Magnetospheric Effects on Climate and Weather

This subject remains of great interest and controversy; however, understanding of the physical processes has not yet emerged. The three effects most widely accepted are the association of the solar magnetic field structure with the intensity of tropospheric circulation on a time scale of days, the influence of the 22 year solar magnetic cycle on drought occurrence, and the relation between solar activity and world-wide temperature changes on a time scale of hundreds of years. The currently most discussed physical mechanism is the relationship between the ionospheric electric potential at high latitudes, which is influenced by the interplanetary magnetic field, and thunderstorm and cloud formations. The study of sun-weather relations represents a combination of magnetospheric research with the Middle Atmosphere Program.

THE IMS IS DEAD - LONG LIVE THE IMS!

This exclamation is quite appropriate. When the IMS was proposed as a major international program of coordinated research, it was necessary to emphatically assure ICSU and the sponsoring agencies in the participating countries that this would be an enterprise of limited duration. So, what comes to an end on December 31, 1979, is the "official" observational phase of the IMS. Yet spacecraft dedicated to the IMS keep feeding us data, most ground-based networks continue in operation, balloon and rocket programs are going on, and the IMS information services are as busy as ever.

We do expect a gradual change in emphasis or mode of study to take place soon when scientists begin concentrating their attention on the massive amount of data accumulated during the official IMS period. But something irreversible has happened: the realization that magnetospheric research cannot be conducted in isolation, whether one considers experimental projects, data analysis and interpretation, modeling, simulation or theoretical studies. Indeed, the magnetosphere is one single system of mutually interacting plasma regions coupled by feedback mechanisms that increase in complexity as one proceeds from the bow shock and the magnetopause through the various boundary layers down into the lower ionosphere. And this also is precisely how the community of scientists studying the magnetosphere should operate: as one single bunch of mutually interacting groups coupled by increasingly complex feedback mechanisms!

To make this possible, it is absolutely necessary to maintain information systems such as the IMSCIE office, and interaction systems such as the IMS data analysis workshops at the SSC, in full operation. During the past years it was essential to know who was measuring what, where, when and why; during the next years it will be essential to know who is analyzing what, where, when and why. We thus look forward to the transition into the "IMS Data Analysis Phase" and wholeheartedly welcome Dr. Gordon Rostoker of the University of Alberta, Edmonton, Canada, who as chairman of a SCOSTEP committee especially set up for this purpose will help us all convert our incredible amounts of data into credible amounts of statements on what really goes on up there!

Time flies. It seems yesterday that, stimulated by a presentation at the 1969 IUCSTP meeting in London by Dr. Skuridin of the Soviet Space Research Institute, we made our first proposal for an international cooperative effort to study the magnetosphere - and now I am writing the very last sentences in my capacity as chairman of the expiring IMS Steering Committee! It is impossible to find appropriate words of thanks to the hundreds of colleagues who since the beginning of IMS planning have helped me with advice and continuous encouragement, thus making my task an exciting, enjoyable and truly rewarding one. An expression of deep gratitude goes to the members of the IMS Steering Committee and the earlier ad hoc Special Study Group, as well as to the staff of all IMS services, who have dedicated so much of their time to plan, set guidelines for, write reports on, and carry out, IMS programs. And on behalf of the entire IMS Company, I wish to convey special thanks to SCOSTEP and its Scientific Secretary, Dr. E.R. Dyer, and to all sponsors of IMS research, the national agencies and academies, and relevant university and institute administrators, without whose support, good will and understanding the IMS would have remained nothing but a scientists' dream.

Happy New Data Analysis Phase to all!

Juan G. Roederer
Chairman
IMS Steering Committee

COMMITTEE ON SPACE RESEARCH (COSPAR)

COSPAR held its 22nd Plenary Meeting and Associated Activities in Bangalore, India, during 29 May - 9 June 1979, at the invitation of the Indian Space Research Organization (ISRO), the Indian National Science Academy, and the Indian National Committee on Space Research.

Presentation of Papers

1. Specialized Symposia and Workshop

- (a) COSPAR/UN/ITU/COSTED Vikram Sarabhai Symposium on Space and Development (5 June)
- (b) COSPAR/IAU/IUPAP Symposium on Non-Solar Gamma Rays (30 May-1 June)
- (c) COSPAR/IAGA(IUGG)/IAMAP(IUGG)/URSI Symposium on Low Latitude Aeronomical Processes (30 May-1 June) Themes:
Equatorial electrojet, electric field, and electric current;
Low latitude middle atmosphere; Low latitude ionosphere above 100 km-modelling, structure and dynamics; Trans-ionospheric propagation; Stratospheric chemistry and sun-weather relationships; Incoherent and coherent scatter observations at low latitudes
- (d) COSPAR/ICSU/IAHS/COWAR/COSTED/UN/UNESCO/WMO Symposium on the Contribution of Space Observations to Water Resources Studies and the Management of these Resources (30 May-1 June)
- (e) COSPAR/IGCP(IUGS/UNESCO)/GSI/IRSO/UN Workshop on Remote Sensing and Mineral Exploration (6-7 June)

2. Open Meetings of COSPAR Working Groups and Panels and Their Topics

- Working Group 3 Informal discussions on progress in high energy astrophysics, progress in space astronomy and, progress in solar and interplanetary physics
- Working Group 4 New models in the upper atmosphere; Upper atmosphere structure and composition results
- Panel 4.A
- Panel 4.B/4.A Disturbed lower ionosphere & W.G. 2 Disturbed upper ionosphere
- Working Group 5 Radiobiological effects in space; Topics in planetary research; Organic molecules in space; Early biological evolution; Gravitational biology; Round-table discussion on radiation standards
- Working Group 6 Meteorological aspects of the tropical high atmosphere; Meteorological observations and applications.
- Working Group 7 Planetary ionosphere and magnetospheres; Planetary surfaces and atmospheric composition; Atmospheric motion and clouds

Publication of Proceedings

The following COSPAR Proceedings will be published by Pergamon Press, Ltd. *Space Research XX*, including the papers presented during the open meetings of the Working Groups on Physical Sciences held in Bangalore. Editor: M.J. Rycroft. *Life Sciences and Space Research XVIII*, which will include papers presented during the open meetings on Space Biology. Editor: W.R. Holmquist. *Advances in Space Exploration*, volume 6, will contain the proceedings from the Vikram Sarabhai Symposium on Space and Development. Editor: Yash Pal. *Advances in Space Exploration*, volume 7, is to include the proceedings from the Symposium on Non-Solar Gamma-Rays. Editors: R. Cowsik and R.D. Wills. *Advances in Space Exploration*, volume 8, will contain the proceedings from the Symposium on Low Latitude Aeronomical Processes. Editor: A.P. Mitra. *Advances in Space Exploration*, volume 9, comprises the proceedings from the Symposium on the Contribution of Space Observations to Water Resources Studies and the Management of these Resources. Editors: V.V. Salomonson and P.D. Bhavsar. *Advances in Space Exploration*, volume 10, containing the proceedings of the Workshop on Remote Sensing and Mineral Exploration. Editor: W.D. Carter.

Participation

The COSPAR Meeting, including the specialized events, open and business meetings, was attended by 468 participants.

Of the thirty-five National Scientific Institutions membering in COSPAR, twenty-nine were officially represented in Bangalore; ten of the thirteen International Scientific Unions participating in COSPAR were also officially represented there. Scientists from countries not membering in COSPAR: Bangladesh, Sri Lanka, Yugoslavia, and Thailand, participated in the COSPAR Meeting and associated activities. Several international bodies, such as ICSU, the United Nations, the ESA, and the IAF, sent observers to participate in the Plenary Meeting and/or the specialized events held in Bangalore.

1980 and 1982 COSPAR Meetings

The invitation of the Hungarian Academy of Sciences to hold the XXIII COSPAR Meeting in Budapest, Hungary, was accepted by the COSPAR Plenary at the Innsbruck Meeting and the dates, 2-14 June 1980, were approved by correspondence in the interval between the 1978 and 1979 Plenaries. The scientific programme for the meeting in Budapest was elaborated in Bangalore (see the next item).

The National Research Council of Canada put forth an invitation to COSPAR to hold its XXIV Plenary Meeting in Ottawa in 1982. The invitation was much appreciated and the Plenary accepted it unanimously; the dates are still to be decided.

Scientific Programme for the XXIII COSPAR Meeting, Budapest, Hungary
2-14 June 1980

1. Symposia and Workshops to be held in conjunction with the COSPAR Meeting in 1980

Symposium on Progress in Planetary Exploration (Proposed co-sponsorship: COSPAR, URSI, IAU, IAGA and IUGG; Proposed dates: 2-4 June 1980)

Subject: The details of the programme are to be defined further, but the symposium should cover the most recent and current progress in planetary exploration, and look to the future in light of the progress made to date.

Symposium on Cosmic Rays in the Heliosphere (Proposed co-sponsorship: COSPAR, IUPAP, IAU, IAGA(IUGG), SCOSTEP; Proposed dates: 3-4 June 1980)

Topics: Results of various space mission measurements of cosmic rays and relevant interplanetary problems, including, hopefully, the first results of extra-ecliptic measurements; Results of cosmic-ray measurements conducted on Earth, if they bear significance as to the conditions outside the ecliptic; Theory: electromagnetic and plasma structure of the heliosphere as seen by cosmic rays, with special respect to increased solar activity (Solar Maximum Year begins 1 August 1979)

Symposium on Physics of Planetary Magnetospheres (Proposed sponsorship: COSPAR, IUGG, IAU; Proposed dates: 4-7 June 1980)

Subject: Review of results obtained during the 1970's on the magnetospheres of the planets including the Earth, and including their interactions with the ionospheres, together with recent results from Interkosmos, ISEE, Pioneer, Prognoz, Venera, and Voyager etc.

Symposium on System Performance and Early Results of the Global Observing System for FGGE (Proposed sponsorship: COSPAR, ICSU, WMO, IAMAP; Proposed dates: 4-7 June 1980)

Topics: Synoptic studies; cloud field analyses, especially cloud-top heights; wind vector determinations; surface temperatures; water vapour distribution; special observing systems-buoys, constant-level balloons, others; measurements in the middle atmosphere; special data (e.g. aerosols, Earth radiation budget).

Symposium on Theoretical Problems in High Energy Astrophysics (Proposed sponsorship: COSPAR, IAU; Proposed dates: 5-7 June 1980)

Topics: High energy process in compact objects; relativistic phenomena, i.e. black holes; accretion in binary systems; theoretical problems in cosmic ray acceleration.

Symposium on Perspectives for Scientific Ballooning during the 1980's (Proposed sponsorship: COSPAR, IUPAP, SCOSTEP; Proposed dates: 6-7 June 1980)

Topics: Balloon instrumentation and balloon-borne experiments; balloon technology, including tethered balloons; operational aspects of long-duration balloon flights.

Workshop on Experience with and Proposed Improvements of IRI (Proposed sponsorship: URSI, COSPAR; Proposed dates: 10-11 June 1980)

Topics: The programme is to: Present comparisons between direct in situ observations, or ground-based observations, of plasma density, temperatures and ion composition with IRI-1978; Compare indirect observations, e.g. electron content, ionospheric radio wave absorption; Formulate proposals for improving IRI.

Workshop on Comparative Studies of Planetary Interiors (Proposed sponsorship: COSPAR, IAU; Proposed dates: 10-12 June 1980)

Topics: Evolution of planets and planetary systems; internal structure of the planets; and planetary magnetism

Symposium on Active Experiments in Space Plasmas (Proposed sponsorship: COSPAR, IAGA(IUGG), IUPAP; Proposed dates: 11-13 June 1980)

Subject: Thorough reviews of the subject, including chemical releases in the ionosphere and solar wind, energetic charged particle injections, and injection of radio waves (from VLF to HF), both in situ and from the ground, and their effects.

2. Topics for Topical Meetings of COSPAR Interdisciplinary Scientific Commissions (ISC's) and a Panel

- ISC A on Space Studies of the Earth's Surface, Meteorology and Climate:
Spectral signature studies related to the specification of spacecraft and sensors: Aspects of mineral studies from space observation
- ISC B on Space Studies of the Earth-Moon System, Planets and Small Bodies of the Solar System:
Space related studies of comets, interplanetary bodies and cosmic dust
- ISC C on Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres:
Representations of energy sources in the Earth's upper atmosphere and ionosphere;
Planetary upper atmospheres and ionospheres;
Models of the terrestrial mesosphere and thermosphere;
Observations of the planets from earth-orbiting vehicles.
- ISC D on Space Plasmas in the Solar System, including Planetary Magnetospheres: will not hold topical meetings, but will participate actively in organizing some of the symposia being organized in Budapest
- ISC E on Research in Astrophysics from Space:
Preliminary results of the Solar Maximum Mission;
UV, IR, and X-ray observations, with emphasis on correlations with cosmic ray phenomena;
High energy astronomy.
- ISC F on Life Sciences as related to Space:
Physical-chemical limits of life in the solar system;
Cosmos-Salyut results and related space flight factors.
- ISC G on Materials Sciences in Space:
Theoretical and applied mechanics contribution to materials sciences in space;
Overview of zero-gravity scientific programmes;
Significant results of zero-gravity experiments and studies;
Gravity dependent phenomena;
Attractive areas of scientific exploration;
Microgravity-related biophysical and biochemical phenomena
- Technical Panel on Dynamics of Artificial Satellites and Space Probes;
Orbital determination and ephemeris computation based on high-precision tracking (joint with Commission B)

Other Symposia and Meetings with COSPAR Involvement in 1980

Workshop on Application of Space Observations to Marine Resources in Developing Countries (Sponsorship: COSPAR, COSTED)

Subject: The workshop will discuss the applications of results of space observations from both operational and earth resources satellites, to the study of marine resources; the areas of interest will include coastal management, upwelling, local productivity, and possible applications to marine geology. Location and dates, USA, one week, around April 1980.

International Colloquium on the Satellites of Jupiter (Sponsorship: American Astronomical Society, COSPAR, and possibly IAU)

Subject: To discuss, through invited and contributed papers, the Jovian satellites as individual worlds and as a system, including their geology, their geochemistry, their interactions with the Jovian magnetosphere, and their origins and evolution. Emphasis is placed on recent Voyager results and their interpretation. Included in the subject matter is the ring of Jupiter. Location and dates: Kailua-Kona, Hawaii, USA, 13-16 May 1980

Symposium on Scientific and Engineering Uses of Satellite Radio Beacons (Sponsorship: COSPAR(Beacon Satellite Group),URSI)

Topics: Ionospheric disturbances (natural and artificial); Scientific uses of trans-atmospheric propagation studies; Tropospheric and ionospheric propagation limitations on Earth/space systems; High latitude ionospheric studies by radio beacon techniques; Equatorial ionospheric studies by radio beacon techniques; Mid-latitude ionospheric studies by radio beacon techniques; Plasmasphere/protonosphere; Techniques of radio beacon measurements. Location and dates: Warsaw, Poland, about 19-23 May 1980

Symposium on Oceanography from Space (Sponsorship: COSPAR,SCOR,IUCRM,IOGG,IUTAM, and with the collaboration of ESA)

Topics: Reviews of satellite observations of such phenomena as waves, currents, tides, geoid, surface, winds, distribution of marine organisms, ocean climate. Discussion of satellite techniques, including optical, infrared, and radio observations and satellite technology. Location and dates: Venice, Italy, 26-30 May 1980.

Symposium on Gravitational Physiology (Sponsorship: IUPS,COSPAR)

Subject: The Symposium will centre around the scientific results of Cosmos 79 with several invited speakers from both the USA and the USSR. Location and dates: Budapest, Hungary, 13-19 July 1980, in conjunction with the IUPS General Assembly.

Second Colloquium on Reference Coordinate Systems for Earth Dynamics (Sponsorship: Polish Academy of Sciences, Center for Cosmic Research, Smithsonian Astrophysical Observatory, COSPAR)

Topics: Geophysical requirements; Reference system definition; Reference system realization-principles and present results; Recommendations. Location and dates: Torun, Poland, July or August 1980.

Workshop on the Calibration and Intercomparison of Ozone Measurement Techniques (Sponsorship: IAMAP(Ozone Commission), WMO,COSPAR,UNEP)

Topics: Measurement interpretation; Calibration and inter-calibration; Effects on measurements of transport and other meteorological factors. Location and dates: Boulder,Colorado, USA, 3-5 days in August 1980.

Ozone Symposium (Sponsorship: IAMAP(Ozone Commission), WMO,COSPAR,AMS,NASA)

Topics: Recent developments on observational techniques; Results and analysis observations; Trace gases relevant to ozone; Photo-chemistry of ozone and related chemical systems; Ozone and circulation; Future directions. Location and dates: Boulder, Colorado, USA, 4-9 August 1980.

Symposium on Radiation (Sponsorship: IAMAP(Radiation Commission), WMO, COSPAR, AMS)

Topics: Radiation in the middle atmosphere; Newest results from radiometric sounding; Atmospheric optics and spectroscopy; Radiation in climate and weather modelling and forecasting; Earth radiation budget; Scattering and absorption of radiation in cloudy and turbid atmospheres. Location and dates: Fort Collins, Colorado, USA, 11-16 August 1980.

Symposium on Dynamics of the Middle Atmosphere (Sponsorship: URSI, COSPAR, IAMAP, IAGA, WMO, SCOSTEP)

Subject: Studies of physical processes in the middle atmosphere by ground-based and satellite remote sensing. Location and dates: Urbana, Illinois, USA, 28 July-1 August 1980.

Symposium Accepted for the 1982 COSPAR Meeting

Symposium on the Changes in the Earth's Surface, as revealed by a Decade of Observations from Space (Proposed sponsorship: COSPAR, COSTED, ICSU, UN)

Topics: Status of Earth observations—state of the art; Reports of changes in regions—forest cover, deserts, urban areas, wetlands, land use, soil status; Future planned systems; Cooperation in the next decade. Special attention will be paid to developing countries for featuring results of programmes there. Proposed duration: Five days during the XXIV COSPAR Meeting, Ottawa, Canada.

INFORMATION ON THE REORGANIZATION OF COSPAR

The new structure of COSPAR was approved as follows:

The responsibilities of the Interdisciplinary Scientific Commissions (ISC's) are:

- to discuss, formulate and co-ordinate internationally co-operative experimental investigations in space;
- to encourage interactions between experimenters and theoreticians in order to maximize space science results, especially interpretation arising out of analyses of the observations;
- to stimulate and co-ordinate the exchange of scientific results;
- to plan symposia and topical meetings for discussion of the results of space research, with an appropriate mixture of limited review and contributed papers;
- to carry out these tasks in the closest possible association with other organizations interested in these and related tasks.;
- to select an editor for the Advances in Space Exploration series for each symposium organized by the Commission and for each issue of Space Research or Life Sciences and Space Research in which any papers from topical meetings of the Commission are to be published;
- to prepare a statement on recent scientific developments in the area of interest of the Commission for the COSPAR Report to the United Nations;
- to name at each COSPAR Meeting, the ordinary members of the Commission or Sub-Commissions for the interval until the next meeting, whether these members be new members or re-appointed members.

The Interdisciplinary Scientific Commissions (ISC's) approved in Bangalore are the following.

- ISC A on Space Studies of the Earth's Surface, Meteorology and Climate
[Chairman: S.I. Rasool (USA); Secretary: S. Ruttenberg (USA)]
 - Subcommission A.1 - The Meteorology and Climatology of the Lower Atmosphere, including Fundamental Dynamical Processes in the Oceans
[Chairman: H.-J. Bolle (Austria)]
 - Subcommission A.2 - Dynamics of Geochemistry and Climatology of the Middle Atmosphere [Chairman: K. Labitzke (FRG)]
 - Subcommission A.3 - Geology and Productivity of the Land Surface and the Oceans [Chairman: E.A. Godby (Canada); Vice-Chairman: R. Ragan (USA)]
- ISC B on Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System [Chairman: J.R. Arnold (USA); Vice-Chairman: V.L. Barsukov (USSR)]

- (C) C on Space Studies of the Upper Atmospheres of the Earth and Planets,
 including Reference Atmospheres [Chairman: S.A. Bowhill (USA);
 Vice-Chairman: M.Ya. Marov (USSR)]
- Subcommission C.1 - Earth's Upper Atmosphere and Ionosphere [Chairman:
 J.E. Blamont (France); Vice-Chairman: E.R. Schmerling (USA)]
- Subcommission C.2 - Earth's Middle Atmosphere and Lower Ionosphere
 [Chairman: D. Offermann (FRG); Vice-Chairman: L.G. Smith (USA)]
- Subcommission C.3 - Planetary Atmospheres; Aeronomy and Reference
 Atmospheres [Chairman: C.A. Barth (USA)]
- Task Group on COSPAR International Reference Atmosphere [Chairman:
 K.S.W. Champion (USA); Vice-Chairman: G. Kockarts (Belgium)]
- Task Group on URSI/COSPAR International Reference Ionosphere
 [Chairman: K. Rawer (FRG); Vice-Chairman: A.D. Danilov (USSR)]
- Commission D on Space Plasmas in the Solar System, including Planetary
 Magnetospheres [Chairman: D.E. Page (ESTEC); Vice-Chairman:
 M.J. Rycroft (UK)]
- Subcommission D.1 - The Three Dimensional Heliosphere
- Subcommission D.2 - Technique and Instrumentation
- Subcommission D.3 - Energy Redistribution in Planetary Magnetospheres
- Commission E on Research in Astrophysics from Space [Chairman:
 S.L. Mandelshtam (USSR); Vice-Chairmen: L.E. Peterson (USA) and
 R.M. Bonnet (France)]
- Subcommission E.1 - Galactic and Extragalactic Astrophysics [Chairman:
 L.E. Peterson (USA); Vice-Chairman: R.M. Bonnet (France)]
- Subcommission E.2 - Solar Physics [Chairman: Z. Svestka (Netherlands)]
- Commission F on Life Sciences as related to Space [Chairman: T.H. Jukes
 (USA); Secretary: S.M. Siegel (USA)]
- Subcommission F.1 - Gravitational Biology [Chairman: N. Pace (USA);
 Vice-Chairman: H. Bjurstedt (Sweden)]
- Subcommission F.2 - Radiation Biology [Co-Chairmen: H. Bucker (FRG)
 and B.Z. Siegel (USA)]
- Subcommission F.3 - Planetary Biology and Origins of Life [Chairman:
 R.S. Young (USA); Vice-Chairman: J. Oro (USA)]
- Commission G on Materials Sciences in Space [Chairman: A. Bewersdorff
 (FRG); Vice-Chairmen: Y. Malméjac (France) and L. Steg (USA)]
- Panel on Frequency Allocation and Radio Transmissions [Chairman:
 R. Leitinger (Austria)]
- Advisory Panel on Space Research and Developing Countries [Chairman:
 J. Sahade (Argentina)]
- Panel on Technical Problems related to Scientific Ballooning [Chairman:
 W. Riedler (Austria); Vice-Chairman: S. Damle (India); Secretary:
 J.P. Chassaing (France)]
- Technical Panel on Dynamics of Artificial Satellites and Space Probes
 [Chairman: L. Sehnal (Czechoslovakia)]
- Panel on Potentially Environmentally Detrimental Activities in Space
 [Chairman: K. Rawer (FRG)]
- Advisory Committee on Data Problems and Publications [Chairman:
 J.I. Vette (USA)]

In regard to the ISSP (ICSU Solar System Panel), the opinion of the
 COSPAR Plenary in Bangalore was that the new structure of COSPAR provides
 an appropriate organizational frame for the scientific activities projected
 for the ISSP, but concerning its educational activities, COSPAR has no pos-
 sibilities of fulfilling this part of the programme and this matter is be-
 ing referred back to ICSU, that they make provisions for these activities
 if it is desired that they continue.

1.2.2. RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY THE EXECUTIVE COUNCIL AND THE XXIInd PLENARY MEETING OF COSPAR, BANGALORE, INDIA, 9 JUNE 1979

Decision No. 1/79, proposed by Interdisciplinary Scientific Commission D.

COSPAR

recognizing the considerable experimental effort that has been expended in many countries in order to make observations during the International Magnetospheric Study (IMS), and

noting the difficulties experienced in certain countries in obtaining funds for the data analysis of experimental data,

strongly recommends that funding agencies provide sufficient resources for carrying out efficient and rapid data analysis and physical interpretation of IMS data to realize the scientific goals of this international programme, and further

recommends that Co-ordination Data Analysis Workshops as demonstrated by the IMS Satellite Situation Center in December 1978, be supported in the IMS Data Analysis Phase 1980-1985.

Decision No. 2/79, proposed by the Panel on Potentially Environmentally Detrimental Activities in Space.

COSPAR

considering that the increase of satellite weight and size increases the danger of unwanted effects during atmosphere re-entry, e.g. localized atmospheric pollution by burn out or damage to human property or even lives by re-entering debris,

urges the launching agencies to be cognizant of these effects and to make appropriate provisions to have such debris impact in areas where no damage to human activity is expected.

Decision No. 3/79, proposed by the Advisory Panel on Space Research and Developing Countries.

COSPAR,

considering the importance of encouraging in developing countries the growth of technologies relevant to the field of space sciences, and

noting the proposal of the Workshop held at Ootacamund, India, last April, *recommends* to the national institutions and international organizations concerned to take the necessary actions with appropriate authorities to support the proposal to establish an international institute for space studies and electronics and to erect a giant radio telescope at an equatorial location, and

further recommends that early attention be given by the participating parties to the problem of training and building up an adequate number of scientific and technical personnel adequately to staff the facilities.

Decision No. 4/79, proposed by Interdisciplinary Scientific Commission C.

COSPAR

noting the approval by ICSU of the Middle Atmosphere Program (MAP) which requires extensive and detailed sounding of the stratosphere and mesosphere for the preparation of the necessary high altitude maps of the region, and

noting the indispensable role played by the world wide meteorological rocket networks,

views with concern the proposed reduction in the US Meteorological Rocket Network from 14 to 6 launching sites, and

urges the US Academy of Sciences to bring to the attention of the relevant US agencies the need to maintain the present or preferably increase the frequency of meteorological rocket soundings, at least until the completion of MAP at the end of 1985.

UNION RADIO-SCIENTIFIQUE INTERNATIONALE (URSI)

On the occasion of the IAGA General Assembly in Canberra, the President of URSI, Prof. W.N. Christiansen (Mt. Stromlo Observatory, Canberra, Australia) sent to the IAGA President a message wishing IAGA a successful meeting.

The following information on URSI is taken from the recent URSI Information Bulletins issued quarterly from the URSI Secretariat in Brussels.

CHANGE IN SECRETARY GENERAL AND SECRETARIAT ADDRESS

Prof. J. Van Bladel (Laboratory of Electromagnetism and Acoustics, University of Ghent, Ghent, Belgium) was appointed as the Secretary General (with effect from 1 October 1979), after Prof. P. Hontoy's resignation was accepted due to his slow recovery from illness.

Dr. C.M. Minnis (who served as the Secretary General of URSI in 1968-78 and also as an acting Secretary until September 1979) left the URSI Secretariat.

From 20 January 1980, the URSI Secretariat (which was in Rue Nieuwenhove 81, B-1180 Brussels) will move to the following address:

URSI Secretariat
Avenue Albert Lancaster 32
B-1180 Brussels
Belgium
(Cable Address: URSISEC BRUSSELS)

60TH ANNIVERSARY OF THE CONSTITUTION OF URSI

At the 19th General Assembly of URSI, the Council accepted the invitation of the Belgian National Committee for Radio Science to celebrate the 60th Anniversary of URSI in Brussels. A memorial colloquium was held on 17-18 September 1979 in the Palace of the Academies in Brussels, the actual building in which URSI was constituted 60 years ago. About 250 participants attended the colloquium. His Majesty King Baudowin accorded his Patronage to this 60th Anniversary, and honoured the occasion by attending, in person, part of the Inaugural Session on 17 September 1979. The following is the outline of the program.

Aspect of Radio Science

Opening Address: Prof. W.N. Christiansen (President of URSI)

60 Years of Research on the Propagation of Radio Waves: Prof. W. Dieminger (Honorary President of URSI)

Acoustic Gravity Waves, Travelling Ionospheric Disturbances, Spread F, and Ionospheric Scintillation: Prof. H.G. Booker (Honorary President of URSI)

Highlights in the Development of Semi-Conductor Devices: Dr. L. Esaki (Nobel Prizewinner for Physics 1973)

Radio Science in the Study of the Universe: Radioastronomy: Prof. A. Hewish (Nobel Prizewinner for Physics 1974).

History of URSI

The Origins of URSI: 1913-1914. King Albert I of Belgium, R. Goldschmidt and International Commission on Scientific Wireless Telegraphy: Prof. L. Bossy (President of the Belgium National Committee for Radio Science)
The First 20 Years of URSI: Dr. B. Decaux (Honorary President of URSI)
Radio Science Half a Century Ago: Prof. J. Groszkowski (Past Vice-President of URSI)
URSI after World War II: Sir Granville Beynon (Past President of URSI)

Communication Science in the Service of Information

Message from Prof. I. Prigogine, Nobel Prizewinner for Chemistry 1977
Radiocommunications as an Aid to Development: Mr. M. Mili (Secretary General of ITU)
Radio Science, Transmission and Instrumentation in the Service of Progress: Prof. P. Grivet (France)
The Economic Value of Information: Prof. R. Radner (USA)
Radiocommunications and International Relations: Mr. S. McBride (Nobel Prizewinner for Peace 1974)

The papers presented at the Colloquium have been printed in a 125-page volume. Copies of this volume and the supplement (including late-arrival text and the opening and closing address of the URSI President) are sent to all member countries of URSI.

SCIENTIFIC PROGRAMME FOR THE URSI 1981 GENERAL ASSEMBLY

The XX General Assembly of URSI is scheduled during 10-19 August 1981 in Washington, D.C., U.S.A. During this assembly the following scientific sessions will be planned.

1. Open Symposia
 - OS1 Remote Sensing
 - OS2 Milimetre and submillimetre waves
 - OS3 Mathematical models in radio propagation
2. General Lectures
 - 3 General Lectures will be held, but the topics and speakers are to be decided later.
3. Technical Sessions and Joint Technical Sessions
 - Each URSI Commission is now considering their programme, and these will contain quite a few tutorial papers.

COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY (CODATA)

CODATA is an interdisciplinary committee of ICSU, which deals with data of importance to science and technology, their compilation, critical evaluation, storage and retrieval. Its scope includes quantitative data on the properties and behaviour of matter, characteristics of biological and geological systems, and other experimental and observational data.

CODATA covers all disciplines represented within the member Unions of ICSU, i.e. the physical sciences, astronomy, the geosciences, and the life sciences, but CODATA's activities concentrate on problems which are common to the various disciplines.

CODATA's purpose is to promote data compilation and evaluation, to improve the quality of data collections and their usefulness to the user community, and to improve data accessibility.

CODATA's Executive Committee consists of

President: Prof. M. Kotani (Japan)

Past President: Prof. P. Melchior (Belgium)

Vice President: Prof. V.V. Sytchev (U.S.S.R.)

Secretary General: Prof. E.F. Westrum, Jr. (U.S.A.)

Treasurer: Prof. N. Kurti (U.K.)

Members: Prof. J.E. Dubois (France), Dr. D.L. Duncan (U.K.),
Prof. H. Gutfreund (U.K.), Dr. W.W. Hutchison (Canada),
Dr. D.R. Lide, Jr. (U.S.A.), Prof. C.N.R. Rao (India),
Prof. W. Schirmer (GDR), Dr. M. Schoenberg (FRG).

CODATA Secretariat address is:

51 Boulevard de Montmorency
75016 Paris, France

CODATA has now the following task groups and advisory panels.

Task Groups: Accessibility and Dissemination of Data
Chemical Kinetics
Computer Use
Data for Chemical Industry
Fundamental Constants
Internationalization and Standardization of
Thermodynamic Data
Key Values for Thermodynamics
Methodology of Handling Space and Time Dependent
Data
Transport Properties
Training Courses on the Handling of Experimental Data

Advisory Panel: Biosciences Advisory Panel
Geoscience Advisory Panel
Industrial Data Advisory Panel.

The 7th International CODATA Conference will be held in Kyoto, Japan, during 8-11 October 1980. (see page 98).

THE INTERNATIONAL WORKSHOP ON SOLAR WIND STUDIES
BY RADIOSTRONOMICAL, GROUND-BASED AND DIRECT METHODS

This workshop was held in Moscow, U.S.S.R., 5-10 April 1979, organized by the Soviet Geophysical Committee and sponsored by IAGA. Prof. K.I. Gringauz acted on behalf of IAGA.

The solar wind has long been studied by a variety of indirect techniques; indeed was actually "discovered" by Biermann through analysis of comet tail observations. Of course direct spacecraft observations are vastly superior when and where they are available, but the methods are complimentary. Ground-based methods are used to extend our information, both to inaccessible regions near the sun and out of the ecliptic, and to span a much larger time period. Although interesting and important results are coming from such work, surprising little attention has been paid to the use of spacecraft data to 'calibrate' the ground-based data in regions of overlap. This workshop, which was held in Moscow, April 5 through 10, is a first step in this direction. The meeting was widely attended by Soviet and East European scientists but participation by North American and West Europeans was weakened by almost simultaneous meetings on related subjects.

In reviewing our understanding of the solar wind three basic problems were identified: 1) Where does the solar wind get its energy? 2) Why do minor ions in the solar wind behave in a special way? and 3) What is the reason for the distinction between fast and slow solar wind? The problem of solar wind energetics is most severe in the high speed solar wind. Although heat conduction makes the solar wind necessary, it is not sufficient to drive as fast an expansion as is observed. This problem is compounded by the fact that high speed solar wind evolves from only 20% of the solar corona. Alfvén waves could provide part of the energy source but face the difficulty that pure Alfvénic (transverse) fluctuations in the MHD limit (having constant density and magnetic field magnitude) do not heat the plasma.

A solution to question 1 seems to require both an identification of the fluctuations present near the coronal base which are responsible for the high-speed coronal expansion as well as a theoretical understanding of their effects on internal plasma transport. Such an understanding is also needed to answer questions 2 and 3. However, a fundamental question concerning the physics of the convection zone, which distinguishes between a fast or slow expansion of the outer coronal layers, still remains.

Progress towards answering the foregoing basic questions can be made on several fronts. The biggest gap in our present understanding stems from an absence of detailed information concerning solar wind conditions close to the sun. Equally important is our lack of understanding of the physics of the solar convection zone. Although ultimately in situ space probes will be required to fill the gaps which concern coronal energetics, important clues can be gleaned from indirect and necessarily integral probes such as provided using radio-astronomical techniques. Near-term progress therefore requires a calibration of these techniques.

Experimental information needed to help sort out the physics of the convection zone will come in part from determination of the global structure of the coronal expansion over time periods long compared with the period of the solar activity cycle. Because of the singular nature of in situ space probe measurements and the nonuniqueness of the information gleaned from radio-astronomical and ground-based measurements, progress requires a combined, closely coordinated study program using all available techniques.

A good deal of discussion was devoted to the various radio-propagation techniques. Reviews of propagation theory, spacecraft radioscience experiments, and scintillation of cosmic sources were given. Two new results are particularly important. First, there is a wide agreement that the plasma electron density spectrum contains more structure than, say, a simple power-law or gaussian. Observers using a variety of techniques presented evidence for an "inner scale" and for a spectral flattening at frequencies just below this "cutoff". These features become more pronounced near the sun. The "inner scale" increases with solar distance and is of the order of 10 km at $10 R_{\odot}$. If this 'structure' can be observed to change during the passage of a stream or a shock, some useful inferences about plasma microstructure can be drawn. The second result is a two-month series of maps showing a daily average enhanced scintillation presented by the group from the Lebedev Institute. These are compiled from daily observations of 150 sources at 102.5 MHz, giving a mean resolution of 12° . In these maps one can identify spatially distinct structures moving outwards. Although the analysis of these maps is incomplete, the potential is striking. This technique will be most valuable for the study of transient events; one hopes that sufficient observing time can be allocated for this purpose during SMY. In general the radiopropagation techniques allow us to explore regions inaccessible to spacecraft and to study microturbulence of higher frequency than spacecraft but they cannot extend our temporal baseline.

In situ plasma measurements were presented by representatives of several groups active in the field. Topics of interest included: 1) long-term interplanetary variations; 2) latitudinal and radial variations of large scale solar wind structures; 3) solar wind heavy ion characteristics and correlation; 4) detailed characteristics of small scale structures such as shocks and non-compressive density enhancements; 5) high energy-angle resolution measurements of electron velocity distributions within flare gas showing bi-directional, field-aligned streaming.

Geomagnetic observations have been used to infer the polarity of the interplanetary magnetic field and this has permitted the extension of solar wind observations back many solar cycles. This work and studies of the connection of solar magnetic fields to the interplanetary magnetic field was reviewed. Of particular interest is the use of Pc3 and Pc4 micropulsations to indicate the presence of a high speed stream. It is claimed that one can distinguish between corotating streams emanating from coronal holes and fast plasmas from a flare-induced transient.

The meeting organizers did an admirable job of balancing the technical sessions with informal discussions. Such discussions were particularly useful in bringing together workers who might not otherwise have met.

Reported by: William A. Coles
University of California, San Diego
W.C. Feldman, Los Alamos Scientific
Laboratory.

This report appeared originally in EoS, Vol. 60, No. 51,
December 18, 1979.

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The International Solar-Terrestrial Predictions Workshop
April 23 - 27, 1979 in Boulder, Colorado, U. S. A.

The purpose of this workshop was to provide in-depth interaction among prediction users, forecasters and scientists involved in research and development of prediction techniques. The goals were to determine current practice at forecast centers throughout the world, applications of predictions, future needs for predictions, and suggestions for new prediction schemes. The Solar-Terrestrial Predictions Workshop was hosted by the NOAA Space Environment Laboratory. Science sponsors included the American Geophysical Union, American Meteorological Society, COSPAR, IAGA, IAU, IUNDS, SCOSTEP, and URSI. Financial and science sponsors included AFGL, AFOSR, Department of Energy, NASA, NSF and the NOAA Environmental Research Laboratories.

The workshop was attended by nearly 200 scientists and forecasters from 18 countries. Representatives from 19 forecast centers attended, including solar physicists from Yunnan Observatory, Peking Observatory and Purple Mountain Observatory, China. It was the largest gathering of solar terrestrial forecasters to date.

In the Working Group on Spacecraft Applications of Solar-Terrestrial Predictions led by A. L. Vampola (Aerospace Corporation, Los Angeles), the major problems discussed included energetic-particle radiation hazards to astronauts and space equipment, space craft charging and neutral atmosphere predictions for estimating satellite orbital lifetime. The working group report concentrates on the users' requirements of predictions for space craft application in the 1980's.

The Working Group on Geomagnetic Applications led by W. H. Campbell (U. S. Geological Survey, Denver, Colorado) discussed mainly the geomagnetic disturbances on long-line electric power networks, long pipe-lines, and geomagnetic survey. Work on geomagnetically induced currents is becoming an increasingly important area of geophysics. One major result of this working group is the formation of a permanent association of those concerned with the effects of geomagnetic variations upon human enterprise. The long-line electric power applications require predictions of the time rate of change of the vector geomagnetic field for individual geomagnetic zones.

The Working Group on Communication Predictions led by A. P. Mitra (NPL, New Delhi, India) included two main subdivisions, one on Ionosphere-Reflected Propagation (led by B. M. Reddy of NPL) and the other on transionosphere propagation (led by J. A. Klobuchar of AFGL, Bedford, Mass.). The latter is a new area for predictions and is starting to use simple empirical global models. The need for ionosphere-reflected propagation predictions and particularly for further research in support of such services has been questioned in the United States. On the one hand, the likelihood that further research will greatly improve predictions has been increasingly doubted because of the apparent lack of major improvements in HF propagation predictions in the past decade. Furthermore, technologically advanced countries can invest in self-adaptive communication systems for emergency military applications that automatically sense and adjust to the current conditions for a particular communications link. The recent increased use of communications satellites and tropospheric microwave links (and the eventual use of fiber optics for communications

cables) has had a major impact on HF radio communications in the United States. The main result of the working group on ionosphere-reflected radio propagation predictions is to emphasize that it is still the major prediction service throughout most of the world and will remain of major importance particularly for third-world countries, especially at low latitudes where HF communications are relatively insensitive to solar-terrestrial disturbances.

Solar activity was considered by two groups, namely Long-Term Solar Activity Predictions led by P. S. McIntosh (NOAA, Boulder, Colorado), and Short-Term Solar Activity Predictions led by P. Simon (Meudon Observatory, France). The main advance in long-term predictions in the past ten years is based on the work of G. M. Brown (University College of Wales) and A. I. Ohl (U.S.S.R.), who found empirical relations between geomagnetic data during the decline of one cycle and the maximum sunspot numbers in the next eleven-year cycle. There is however, strong applications need for even longer term predictions (10 - 20 years) where the accuracy of current predictions are inadequate.

Magnetospheric disturbances were considered by three working groups: Solar Wind and Magnetosphere Interactions, led by C. T. Russell (UCLA); Geomagnetic Storms, led by S.-I. Akasofu (University of Alaska); and Energetic Particle Disturbances, led by G. A. Paulikas (Aerospace Corp.). One common result of these groups is a move away from the traditional geomagnetic indices toward monitoring a basic set of solar wind and magnetosphere parameters in order to improve forecasts of the magnetosphere and ionosphere. Ionospheric disturbances were considered by four working groups: Magnetosphere-Ionosphere Interactions, led by R. R. Vondrak (SRI); High Latitude E- and F-Region Ionospheric Predictions, led by R. Hunsucker (University of Alaska); Midlatitude and Equatorial E- and F-Region Predictions, led by C. Rush (ITS, NTIA, Boulder, Colorado); and D-Region Predictions, led by E. Thrane (NDRE, Kjeller, Norway). The reports of these groups each presents numerous recommendations about future monitoring measurements, indices, research and prediction development work.

The Working Group on Solar-Weather Predictions was led by K. Schatten (Boston University). Solar-weather relations has recently been a very active research topic and was included to consider whether this field is ready to make predictions. Some argue that the results of recent correlative studies of solar activity and weather should be used to make predictions. Conversely, others insist the correlations are too low and the physical link between solar activity and weather relations is not yet known. The group's recommendations involve further research on the most promising sun-weather mechanisms. A forecast about the 22 year drought cycle is made in the working group report as an academic prediction against which our knowledge can be tested in the next few year.

The Solar-Terrestrial Predictions Proceedings is available from the U. S. Government Printing Office. Volume I contains review papers by groups that routinely make some type of solar-terrestrial prediction. Volume II includes the working group reports and topical review papers. Contributed papers on new prediction techniques are in Volume III.

[Reported by Richard F. Donnelly, Space Environmental Laboratory, NOAA/ERL Boulder, Colorado 80303, U.S.A.]

Report on an Informal Workshop on Natural EM Fields at Audio Frequencies
held under the auspices of IAGA at the 1979 Assembly, Canberra

An informal workshop was convened (7.30-11 pm, 11 December) to explore the state of knowledge regarding variations in natural EM fields in the ELF and lower VLF. The question arose when specifying sensors for Audio MT equipment, and it became evident that the behaviour of amplitudes with latitude, season, and time of day is not well known. We wished to consider whether it would be useful to plan a cooperative program of synoptic measurements. The 50-60 participants heard presentations by D. Hoover (USGS), D. Strangway (Toronto), G. Fischer (Neuchatel), L. Holcomb (Macquarie), J. Clarke (Berkeley), and N. Kleimenova (Inst. Phys. of the Earth, Moscow).

Hoover described his system, results, and difficulties. He finds that at times he is unable to measure useable signal between 300 Hz and 3 kHz, but that interference from power line fundamental and harmonic frequencies is a more severe problem in some regions. It was essential that his band selection filters be sufficiently narrow to reject these frequencies. Constant Q filters were unsatisfactory for higher harmonic rejection.

Strangway also uses a switchable narrow band scalar system, with which he has done more than a thousand sites. He also reported occasional problems with weak signal in the 1-3 kHz band. His approach is to rapidly acquire data at many locations with perhaps $\pm 5\%$ accuracy, instead of $\pm 1\%$ data at fewer sites. Thus the infrequent loss of data in this absorption band is not serious. With this approach he has carried out surveys at high latitudes in both winter and summer.

Fischer referred to a paper he and Schnegg were to give on the 14th. Their measurements in Switzerland suffer severe interference from the electric railways using $16^{2/3}$ Hz and the mains at 50 Hz. Thus in addition to facing power line fundamental and harmonics, they must deal with a strong subharmonic. The approach they have developed is to notch filter enough of the highest amplitude harmonics that they can record digitally, without saturation, most of the time. Those record segments which include saturation are rejected. Remaining harmonics are filtered digitally, and then results from the majority are averaged together. Averaging continues until impedance-frequency plots are acceptably smooth.

Holcomb sketched the AMT system assembled at Macquarie, then went on to describe the low noise induction coil-preamplifier design. By choice of materials and design, a resonant frequency of 3 kHz and a Q in excess of 50 was obtained. This is loaded and drives a "cold resistance" preamplifier integral to the coil structure. The predicted noise level ($\sim 10^{-6}$ nT/Hz^{1/2}) in the absorption band is 30-40 db below the signal levels reported there by Bleil and by Clerc. At lower frequencies, preamplifier noise increases as f^{-1} , and may be too great near 1 Hz. This can be overcome by using a chopper amplifier for the lower frequency band (0.1-100 Hz). By virtue of a large dynamic range and slewing rate, the system operates without saturating in suburban Sydney.

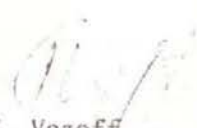
Clarke outlined the physical basis of Josephson junction Squids, including the difference between AC and DC designs, and between magnetometers and gradiometers. Noise is determined by junction capacitance and circuit inductance. Using precision photolithographic equipment to reduce junction

area, he is now able to produce DC Squids with noise levels of 10^{-7} - 10^{-8} nT.Hz^{-1/2} with a frequency response from DC to well above any frequency of geophysical interest. The latter is limited by the slewing rate of associated electronics rather than by the Squid itself. Clarke also showed the great improvement in MT apparent resistivity curves which results from using the "remote reference" technique pioneered in his laboratory in 1977-78.

Kleimenova's laboratory has for many years routinely monitored variations above 700 Hz as a tool for investigating magnetospheric processes. It appears to be the only such observatory, and is located well outside a small village which is several hundred km from the closest power transmission line. Because of their concern with processes outside the atmosphere, they record hiss, chorus, and whistlers, but reject atmospherics which are the dominant signal. He estimates that atmospherics are typically 20 db larger than the magnetospherics.

Due to the lateness of the hour (and the imminent closing of the bar) concluding discussions were held in the University Union. It appeared that the new Squids offered adequate sensitivity for AMT purposes, although they might not have sufficient dynamic range to deal with very large near-source atmospherics and power transients at the same time as the worldwide atmospherics background. Only minor improvements can be anticipated in portable induction coil systems. These apparently have low enough noise most of the time for most purposes. However, it is evident that the statistical parameters of field variations are not well known (except possibly for magnetospheric events).

From these considerations one can conclude that there is some benefit to be gained from synoptic monitoring using common equipment and procedures. This benefit might be considerably enhanced if the measurements are done in such a way as to assist ionospheric, radio propagation, or meteorological studies as well. Individual discussions have since been held on the topic, Macquarie will send a tentative design to interested parties for comment, and will build at least one channel during 1980. Hoover definitely plans to participate as well. Correspondence and suggestions are invited.


K. Vozoff
Exploration Geophysics centre
Macquarie University

FUTURE INTERNATIONAL MEETINGS OF INTEREST TO IAGA SCIENTISTS

The international conferences listed below are those likely to be of interest to IAGA scientists, whether or not they are sponsored by IAGA.

INTERNATIONAL CONFERENCE ON PLASMA PHYSICS (Joint Conference of "Fourth International Congress on Waves and Instabilities in Plasmas")

Nagoya, Japan; 7-11 April 1980

Sponsors: IUPAP; supported also by URSI

Scope: The Conference will cover almost all subjects on plasma physics, i.e. theory, computation and basic experiments on waves, instabilities, nonlinear phenomena, transport phenomena, particle acceleration, turbulence, coherence, stochasticity, etc., in plasmas, such as those found in fusion devices, space and laboratories. Emphasis will be placed on fully-ionized, rather than partially-ionized gases.

Contact address: Prof. Y.H. Ichikawa, Secretary General of ICPP-1980, Institute of Plasma Physics, Nagoya University, Nagoya 464, Japan.

INTERNATIONAL WORKSHOP ON RELATIONS BETWEEN LABORATORY AND SPACE PLASMAS (in association with the International Conference on Plasma Physics 1980)

Tokyo, Japan; 14-15 April 1980

Topics: 1) The critical velocity
2) Beam plasma discharges and interactions
3) Double layers and shocks
4) Instabilities in the equatorial and auroral electrojets
5) Other outstanding problems

Further Information from: Prof. H. Kikuchi (Organizer), Nihon University, College of Science and Technology, Kanda Surugadai 1-8, Chiyoda-ku, Tokyo 101, Japan.

SYMPOSIUM "ACTUAL PROBLEMS OF GEOMAGNETIC RESEARCH"

Niemegk, GDR; 2-6 June 1980

Organizer: The Academy of Science of German Democratic Republik

Background: This symposium is planned in connection with the 50th anniversary of the "Adolf-Schmidt-Observatory" for Geomagnetism in Niemegk. This geomagnetic observatory had its opening ceremony on 23 July 1930, the 70th birthday of Prof. Dr. Adolf Schmidt. The geomagnetic observatory was established first in 1889 in Potsdam, and then it moved to Seddin in 1908, and further to Niemegk in 1930 with new facilities. Hence the observatory has now the records of routine observations over 90 years.

Further information on the ceremony and the symposium can be obtained on request from Dr. H. Schmidt, Adolf-Schmidt-Observatory, Lindenstrasse 7, 1824 Niemegk, German Democratic Republic.

XIII COSPAR MEETING AND ASSOCIATED ACTIVITIES

Budapest, Hungary; 2-14 June 1980 (see the information under item COSPAR)

WORKSHOP ON SHOCK WAVES IN THE SOLAR CORONA AND INTERPLANETARY SPACE

Smolenice near Bratislava, Czechoslovakia; 15-19 June 1980 (post-COSPAR)

Topics: The workshop will cover almost all subjects on shock waves in the solar corona and interplanetary space, i.e. observations and theoretical considerations with emphasis on physical interpretations:

- Generation and basic physics of shock waves in chromosphere, corona and interplanetary space.
- Structure of shock in collisionless interplanetary plasma.
- Interplanetary shock propagation and energetic particle modulation.
- Shock propagation, particle acceleration and transients in the corona.
- Shock wave interaction with planetary magnetospheres and ionospheres.

Further Information from: Dr. S. Pinter, Geomagnetic Observatory, Geophysical Institute of the Slovak Academy of Sciences, CS 947 01 Hurbanovo, Czechoslovakia.

XVI INTERNATIONAL GEOLOGICAL CONGRESS

Paris, France; 7-17 July 1980

Organizer: IUGS

Special Colloquia on: Mineral resources, Energy resources, Geology of the oceans; Geology of continental margins; Geology of alpine chains; Geology of Europe; Geology of France.

Further Information from: Dr. W.W. Hutchinson, IUGS Secretary General, Geological Survey of Canada, 601 Booth Street, Ottawa K1A 0E8, Canada, or Secretariat General of the XVI International Geological Congress, Maison de la Géologie, 77-79 rue Claud Bernard, 75005 Paris, France.

XV INTERNATIONAL SYMPOSIUM ON EQUATORIAL AERONOMY

Quebradillas near Arecibo, Puerto Rico; 17-24 July 1980

Sponsors: URSI, IAGA, IUGG, COSPAR.

Topics: It is anticipated that a broad variety of subjects bearing directly and indirectly on equatorial aeronomy will be discussed. In addition to problems in low-latitude aeronomy and geomagnetism, symposium topics may include problems in radio propagation (such as trans-equatorial propagation, spread-F scattering, etc.), lower and middle atmospheric behaviour, and solar-interplanetary effects on equatorial aeronomy-climatology. Special emphasis will be given to plasma bubbles, equatorial airglow, electromagnetic and dynamic interactions between high and low latitudes, and particularly the dynamic coupling or interaction between the thermosphere and middle atmosphere as observed by the MST radar technique.

Further information from: Prof. S. Matsushita (Chairman of ISEA Organizing Committee), High Altitude Observatory of NCAR, P.O. Box 3000, Boulder, Colorado 80307, U.S.A.

WORKSHOP ON LATIN AMERICAN GEOMAGNETIC OBSERVATORY AND SURVEY PRACTICE

Rio de Janeiro, Brazil; 20-26 July 1980

Sponsors: Observatorio Nacional, Pan American Institute of Geography and History, Inter American Geodetic Survey, Instituto Geofisico del Peru, World Data Center A, U.S. Naval Oceanographic Office, U.S. Geological Survey, and IAGA.

Participants: Geomagnetic workers in Latin America and other geomagneticists and observers.

Purpose: To improve the quality of the Latin American geomagnetic programs by: Informing the participating technicians and geophysicists of the state-of-the-art in the various areas of geomagnetic work, and of the methods of application; discussing common problems and their solutions; promoting information exchange by personal contact among the participants; providing information which might assist in strengthening the bases of the national programs; and encouraging participation in the international programs.

Further Information from: Dr. L.M. Barreto, Observatorio Nacional, R General Bruce 586-ZC-08, Sao Cristovao, 20000 Rio de Janeiro, Brazil.

INTERNATIONAL SYMPOSIUM ON MIDDLE ATMOSPHERE DYNAMICS AND TRANSPORT

Urbana, Illinois, U.S.A. (University of Illinois); 28 July-1 August, 1980.

Sponsors: IAMAP, IAGA, URSI, COSPAR, SCOSTEP, IUCRM

Topics: The program will consist of invited review papers and contributed papers on the following topics:

- Recent Developments in Techniques of Observations of Middle Atmosphere Dynamics-ground-based, in situ, and satellite techniques
- Results of Observations of Middle Atmosphere Dynamics-analysis of observations, climatology, long waves, sudden warmings, tides, gravity waves, turbulence, solar-middle atmosphere relations, etc.
- Models of Middle Atmosphere Dynamics-general circulation models, 2-dimensional models, and models of particular phenomena of all scales
- Interaction between Middle Atmosphere Dynamics and Chemistry and Radiation
- Coupling between the Middle Atmosphere and Troposphere and Thermosphere-including mass exchange coupling, and the dynamical effects of radiation and chemistry.
- Future Directions-progress in theory and modelling, critical observations and observing programs, future developments in techniques of observation, the Middle Atmosphere Program.

Remarks: The deadline for abstracts will be in April 1980. The Second Circular, giving details for preparation of abstracts, travel accommodations, and other Symposium information, will be sent to the mailing list of the MAP Newsletter. Pre-registration forms are available from T.E. VanZandt (Chairman of the Organizing Committee), NOAA R445, 325 South Broadway, Boulder, Colorado 80303, U.S.A., or S.A. Bowhill, Department of Electrical Engineering, University of Illinois, Ann Arbor, MI 48109, U.S.A.

VI INTERNATIONAL CONFERENCE ON ATMOSPHERIC ELECTRICITY

Manchester, England, 28 July-1 August, 1980.

Organizer: International Commission on Atmospheric Electricity of IAMAP

Session arrangement: A conference committee has been established to deal with the organization of the conference and an executive panel has been formed to guide and advise the organizers of the conference. The sessions will be streamlined according to the following Subcommittee infrastructure of the ICAE and the Subcommittee officers will carry the burden of structuring their respective sessions. Subcommittees are:
I. Methods of Measurement, Stations, Units, Terminology, Standards;
II. Global Circuit and Fair-Weather Electricity; III. Planetary and Space Problems of Atmospheric Electricity; IV. Ions, Aerosols, Radioactivity; V. Cloud-, Precipitation-, and Thunderstorm-Electricity;
VI. Lightning and Sferics; VII. Applications of Atmospheric Electricity.
Further Information from: Dr. L.H. Ruhnke, Secretary of ICAE,
11208 Wedge Drive, Reston, VA 22090, U.S.A.

INTERNATIONAL OZONE SYMPOSIUM

Boulder, Colorado, U.S.A.; 4-9 August 1980

Sponsors: IAMAP Ozone Commission, WMO, COSPAR

Further Information from: Prof. J. London, Department of Astro-Geophysics,
University of Colorado, Boulder, Colorado 80309, U.S.A.

INTERNATIONAL RADIATION SYMPOSIUM

Fort Collins, Colorado, U.S.A.; 11-16 August 1980

Sponsors: IAMAP Radiation Commission, WMO, COSPAR

Further Information from: Prof. T.H. Vonder Haar, Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado 80523, U.S.A.

FIFTH WORKSHOP ON ELECTROMAGNETIC INDUCTION IN THE EARTH AND MOON

Istanbul, Turkey; 17-24 August 1980

Organizer: IAGA Working Group I-3

Sponsors: IAGA, IUGG

Topics: The Workshop programme will focus on some of the following topics, proposed by the Business Meeting of the IAGA WG I-3 in Canberra, but papers on other topics in the field of electro-magnetic induction will be also welcome.

1. Electrical properties of minerals and rocks in relation to crustal and upper mantle conditions
2. Geophysical prospecting with electromagnetic methods
3. Observational techniques on land and sea
4. Forward and inverse problems in electro-magnetic studies
5. Time-dependent transfer functions
6. Electrical conductivity structure in the lower crust.
7. Electromagnetic induction in the oceans
8. ELAS (a progress report)

Further Information from: Dr. A.M. Isikara, Department of Geophysics,
Faculty of Earth Sciences, University of Istanbul, Istanbul, Turkey.

VII MPAE-LINDAU SYMPOSIUM ON IONIC COMPOSITION

Lindau (Harz), Fed. Rep. Germany; 25-29 August 1980

Scope: Composition of ions with energies up to 1 MeV per per nucleon.

The objectives of the symposium are to bring together experimentalists and theorists for a discussion of new measurement techniques, results, and theories, relating to ion composition of space plasmas. The symposium is planned as a rather informal meeting with emphasis on discussion as is the tradition of the MPAE-Lindau Symposia.

Further Information from: Dr. C.K. Goertz, Max-Planck-Institut für Aeronomie, D-3411 Katlenburg-Lindau 3, Fed. Rep. Germany.

AUTUMN COURSE ON PHYSICS OF FLOW IN THE OCEANS, ATMOSPHERE AND DESERTS

Trieste, Italy; 30 September-28 November 1980

Organizer: The International Centre for Theoretical Physics, Trieste, Italy

Sponsors: IUGG, IAEA, UNESCO

General Programme:

Weeks 1-4 (30 September-24 October): Course on Geophysical Flow Dynamics (Directed by Prof. A.H. Cook)

Week 5 (27-31 October): Topical Meeting on Physics of Waterlogging and Salinity (Director to be appointed)

Week 6 (3-7 November): Conference on Circulation and Transport in the Mediterranean (Directed by Prof. H. Lacombe)

Weeks 7-9 (10-28 November): Workshop on Physics of Desertification (Directed by Dr. M.H.A. Hassan)

Further Information from: International Centre for Theoretical Physics, P.O. Box 586, I-384100 Trieste, Italy

VII INTERNATIONAL CODATA CONFERENCE

Kyoto, Japan; 8-11 October 1980

Scope: The subtitle of this conference is "Role of Data in a Dynamic World". The scope will range from the role of data in basic scientific research to applications focusing on major problems facing society. Some of the aspects which will receive special emphasis are: formation of new scientific concepts and solution of problems using existing data; needs for new, evaluated data to test new working hypotheses; critical evaluation of data; promotion of data reliability in scientific applications.

Further information from: Japan Society for CODATA, Dai-ichi Kanamori Bldg, Yushima 1-5-31, Bunkyo-ku, Tokyo, 113 Japan.

Note: Scientists from many parts of the world representing different disciplines will participate in sessions specifically devoted to: Natural and Controlled Ecosystems, Biological Sciences, Geosciences, Computer Storage and Dissemination of Data, Large Data Banks, Data in Industrial Applications, Thermodynamics, Spectroscopy, and other submitted contributions.

RECENT PUBLICATIONS (IAGA BULLETINS AND OTHERS)

IAGA BULLETINS

IAGA Bulletin No.32-series "Geomagnetic Data".

No.32g (Geomagnetic Data 1976) was published in April 1978, and No.32h (Geomagnetic Data 1977) in May 1979. The next issue No.32i (Geomagnetic Data 1978) is now in preparation. These are available at \$4.50 each from the IUGG Publications Office (39 ter, Rue Gay-Lussac, 75005, Paris France)

Some Remarks in the Report from the International Service of Geomagnetic Indices (issued in October 1979)

Since the last IAGA Assembly in Seattle, the work of ISGI has gone on in a regular way, apart from incidental delays in the publication of monthly and yearly bulletins, caused by irregularities in the data flow. The monthly bulletins on Kn, Ks, Km etc., issued by the Institute de Physique du Globe de Paris are now also included in the ISGI-work.

It appeared from studies by Dr. M. Siebert and Dr. P. Mayaud that the aa-indices for 1969 through 1976, as published in IAGA-Bulletin No.39 (1968-1975) and No. 32g (1976) are not correct. Revised indices were computed in Paris and correction-sheets for the values 1969-1975 were sent to all recipients of IAGA-Bulletin No.39. The revised aa-indices for 1976 were published in IAGA-Bulletin No.32h.

As usual, the lists of rapid variations were prepared at the Observatorio del Ebro. For ssc's the new method, adopted at the Grenoble-Assembly, was applied successfully, although it was sometimes difficult to gather the magnetograms. Solar-flare effects and "very unusual events" were listed with the help of check-lists, scrutinized at the observatories. Due to differences in the reporting practices of the observatories, the composition of the check-lists and the definite lists caused a lot of trouble to Dr. Romana. Especially for the "very unusual events", it appeared to be very difficult to arrive at a satisfactory listing.

A new list of letter-symbols for the magnetic observatories was prepared by the Director of ISGI and sent to observatories, institutes etc. for comments. The definite list of symbols has been composed at the WDC-A for Solar Terrestrial Physics, which has also taken over the task of assigning appropriate symbols to new magnetic observatories, in close cooperation with the center which assigns symbols to seismological observatories. The new symbols were used already in the last part of IAGA-Bulletin No. 32h, to which an explanatory list was added

In order to improve the quality of the K-indices, needed for the determination of the indices Kn, Ks and derivatives, Dr. P. Mayaud visited the observatories which partake in this project. The results of his work are given in a special report.

The financial situation of the ISGI has been favourable during recent years. The decision made some years ago to stop the mechanical processing of K-indices caused a noticeable decrease of the expenses and resulted in a rather high positive balance. However, the situation is changing quickly now because of the diminished value of the subvention, received through FAGS. For 1979 the subvention will be scarcely sufficient to cover the direct cost of the regular bulletins. Part of the balance is earmarked for the publication of an extra IAGA-Bulletin (No. 40, Dst-tables and diagrams for the years 1957-present). If the FAGS Subvention is not increased, it may be necessary to take further economising steps or to call on IAGA for financial help in the near future.

IAGA Bulletin No. 41. Transactions of the Third General Scientific Assembly of IAGA in Seattle, U.S.A., 1977

The 204-page publication is still available at \$10.00 from the IUGG Publications Office.

IAGA Bulletin No. 42. Program-Abstracts of the First International Symposium on IMS Results held at La Trobe University, Melbourne, Australia, Nov.-Dec. 1977

This 64-page publication is now available at \$3.00 from the IUGG Publications Office.

IAGA Bulletin No. 43. Program-Abstracts of the XVII IAGA General Assembly in Canberra, Australia in December 1979

This 389-page booklet is now available at \$5.00 from the IUGG Publication Office, but there are only a limited number of copies left. This insufficient number of stock copies resulted from the unexpected number of copies (more than 110) purchased in Canberra by the IUGG participants who registered for Associations other than IAGA.

PUBLICATIONS AVAILABLE ON REQUEST

AN INTRODUCTION TO THE AFGL MAGNETOMETER NETWORK

This 18-page report (authors: D.J. Knecht, R.O. Hutchinson and C.W. Tsacoyeanes) published in April 1979 summarizes the essential features of the magnetometer network constructed and operated by the Air Force Geophysics Laboratory. The descriptions cover "Data Collection Stations" (station sites, scientific instruments, data-conditioning circuitry), "Data Acquisition Station (the communication link, network control, data reception and processing), "Output Data" (magnetograms, digital data tapes, realtime data, request for data), with 12 illustrations and 1 table.

At the IAGA Meeting in Canberra, Dr. P. Fougere collected many names and addresses of scientists who wanted to receive a copy of the above report. Unfortunately his brief case containing that list was stolen at an airport on the way home. Would anyone who would like to receive a copy of this 18-page document, please send a letter or postcard to one of the authors or to Dr. P. Fougere, AFGL/PHG, Hanscom AFB, MA 01731 U.S.A.

GEOMAGNETIC OBSERVATORIES 1978 (Report SE-21 from the World Data Center A for Solid Earth Geophysics)

This 88-page report was published in November 1979 as a contribution to IAGA. The included materials were compiled through IAGA Working Group V-1 on Magnetic Observatories by C. Sucksdorff, H. Nevanlinna and K.L. Svendsen. This publication contains the information on the various observatories data reporting and exchange, recording instruments and methods of baseline control, as well as ordering the 209 magnetic observatories throughout the world according to name, latitude and country. Included are a copy of the questionnaire (on which the report is based) and IAGA Resolutions concerning magnetic observatories adopted since 1963.

WDC-A for Solid Earth Geophysics have already distributed this publication to all the names on its geomagnetism list, but a small remaining stock of this publication is kept to fill the request from others. Request for copies should be directed to World Data Center A for Solid Earth Geophysics, EDIS/NOAA, Boulder, Colorado 80303, U.S.A.

ICOSAHEDRON GLOBE OF THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD

A do-it-yourself icosahedron globe of the IGRF is available on request from the National Geophysical and Solar-Terrestrial Data Center (NGSDC) in NOAA, Boulder, Colorado 80303, U.S.A.

MAGNETOSPHERIC STUDY 1979

This is the Proceedings of the International Workshop on Selected Topics of Magnetospheric Physics, held in Tokyo, 13-16 March 1979. This publication of 401 pages contains the extended abstracts of the papers.

I.	Magnetospheric Disturbances	19 papers
II.	Magnetospheric ULF Waves	20 papers
IIIA.	Wave-Particle Interactions in the Magnetosphere Observed by Satellites	12 papers
IIIB.	Wave-Particle Interactions in Polar Regions and VLF Phenomena	7 papers
IIIC.	Planetary Radio and Plasma Waves	1 paper
IV.	Solar Wind-Magnetosphere Interactions	14 papers
V.	Physics of the Plasmopause	9 papers

In addition, the proceedings contain "Some Remarks on IMS and Outline of the Chinese Program" given by K.K. Tschu at the closing session.

A limited number of copies of this publication is still available on request from

Dr. A. Nishida, Institute of Space and Aeronautical Science,
University of Tokyo, Tokyo 153, Japan.

NATIONAL REPORTS PRESENTED TO THE IAGA CANBERRA ASSEMBLY

To the XVII General Assembly of IAGA in Canberra in December 1979, National Reports were presented from the following IAGA member countries: Czechoslovakia, German Democratic Republic, Federal Republic of Germany, France, Hungary, India, Italy, Turkey, U.S.S.R., U.K. and U.S.A.

The Secretary General keeps in his office a limited number of the reports from Czechoslovakia, FRG, France, Hungary, India, U.S.S.R., U.K. and U.S.A. Please write to N. Fukushima (Geophysics Research Laboratory, University of Tokyo, Tokyo 113, Japan) if you wish to have some of these reports. If the copies in stock become exhausted, I will pass your request on to the National Correspondents of these member countries. The requests for the National Reports from GDR, Italy and Turkey must be sent directly to the National Correspondents.

USEFUL INFORMATION OF INTEREST

MODIFICATION OF DIGITAL DATA EXCHANGE TAPE FORMAT

(refer to IAGA News No. 12, p. 34)

At the Canberra-Assembly, the tape formats used in exchange of geomagnetic observatory data were widely discussed in the Working Groups of IAGA Div V and in the Div V business meeting. As a result, IAGA Div V recommends the following:

To maintain maximum compatibility between the many different computers in use, coded rather than binary format should be used.

Preferred format (1): 9-track; 1600 bpi ASCII format; odd parity.
Other standard formats: (2): 9-track; 1600 bpi; EBCDIC format; odd parity.
(3): 9-track; 800 bpi; NRZI, ASCII and EBCDIC formats, odd parity.
(4): 7-track; 556 and 800 bpi; NRZI and BCD formats; even parity

Tapes should be unlabelled as there is great variation in label conventions. End of information should be identified by two consecutive file marks.

The World Digital Data Centers accept the tape formats as follows:

World Digital Data Center	Formats in use
WDDC-A for Solar Terrestrial Physics Environmental Data Service NOAA, Boulder, Colorado 80302, USA	(1), (2), (3), (4)
WDDC-B Molodezhnaya 3 Moscow 117 296, USSR	(1), (3)
WDDC-C1 Geomagnetism unit Institute for Geological sciences Hertsmonceux Castle, Hailsham, Sussex, BN27 1RP United Kingdom	(1), (2), (3)
WDDC-C2 for Geomagnetism Indian Institute of Geomagnetism Colaba Bombay 5, India	(1), (2), (3), (4)

MAGSAT INFORMATION

The MAGSAT project is a cooperative effort between NASA and the U.S. Geological Survey, and is one of several integrated elements of NASA's Resources Observation Program dedicated to the use of satellites for studies of non-renewable Earth Resources. The project's objectives include obtaining an accurate description of the Earth's magnetic field, acquiring data for updating and refining world and regional magnetic charts, compiling a global crustal magnetic anomaly map, and the interpretation of that map in terms of geologic/geophysical models of the Earth's crust.

The MAGSAT satellite was successfully launched by NASA from the Western Test Range near Lompoc, California, on October 30, 1979, at 1416 U.T. aboard a scout launch vehicle. The preliminary orbital elements are as follows:

Apogee 561 km, Perigee 352 km, Period 93.726 min. Inclination 96.76°. The satellite lifetime is now estimated to be until mid or late March 1980, i.e. 4.5 to 5 months from the launching.

The magnetometer boom was extended on November 1. Both scalar and vector magnetometers have been turned on, the attitude transfer system is functioning, and the star cameras are turned on. Quick look data are currently being processed, and the data quality is being assessed.

THE MAGSAT PAYLOAD. The Magsat payload consists of scalar and vector magnetometers. Data from the instruments are collected continuously and stored alternately on the two spacecraft tape recorders. These magnetometers are deployed after launch to a position 6 meters behind the spacecraft. At this distance, the influence of magnetic materials from the instrument and base module (chiefly from the star cameras) is less than 1 nT (gamma).

The scalar magnetometer has two dual-cell, cesium-vapor sensor heads whose output frequency is proportional to the total magnetic field. The scalar magnetometer's basic accuracy is of the order of 0.5 nT with a digital resolution and accuracy of between 0.5 and 1.0 nT, and is sampled 4 times a second.

The vector magnetometer consists of three fluxgate sensing elements aligned along orthogonal axes. The magnetic field is sampled 16 times per second along each axis. Each vector measurement is expected to have a resolution of better than 1 nT and an absolute accuracy of better than 3 nT root sum square (rss).

Onboard star sensors, the sun sensor, and the ATS will be used for determination of the spacecraft attitude. Initial attitude data will be processed to an accuracy of 20 arc-minutes and, later, the attitude data will be processed to an accuracy of 20 arc-seconds.

In response to the MAGSAT Announcement of Opportunity, 53 proposals were received by NASA. After the selection by evaluation of these proposals, NASA is now taking action to make contract/agreement with selected investigators, to whom a set of MAGSAT data will be provided. However the MAGSAT data products are available also to non-contractors in the following way.

NSSDC (National Space Science Data Center, the address is shown below) will provide data and information upon request to any user or organization resident in the United States. In addition, the same services are available to users outside the United States through the World Data Center A for Rockets and Satellites (WDC-A-R&S).

Normally, a charge is made for the requested data to cover the cost of reproduction and the processing of the request. The user will be notified of the cost, and payment must be received prior to processing the request.

However, as resources permit, the Director of NSSDC/WDC-A-R&S may waive the charge for modest amounts of data for use in scientific studies or specific educational purposes when they are requested by a researcher affiliated with:

- NASA installations, NASA contractors, or NASA grantees
- Other United States Government agencies, their contractors, or grantees
- Universities or colleges
- State or local governments
- Nonprofit organizations

Magsat digital data will be available in both complete form ("Chronicle" data) and a lower resolution form ("Investigator" data). On request, the "Investigator" data can be selected within a specified geographical area, and it can also be separated according to magnetically quiet or magnetically disturbed time periods.

The data products, price quotes, standard order forms, and ordering instructions will be available from:

For domestic orders: National Space Science Data Center
Code 601
NASA/Goddard Space Flight Center
Greenbelt, MD 20771
Telephone: 301-344-6695

For foreign orders: World Data Center A for Rockets and Satellites
Code 601
NASA/Goddard Flight Center
Greenbelt, MD 20771, U.S.A.
Telex: 89675 NASCOM GBLT

NASA is issuing the MAGSAT Information Bulletin; 3 Bulletins appeared before the launching of MAGSAT in October 1979. These bulletins contain a variety of information on the MAGSAT itself and the availability of many other useful publications related to the MAGSAT investigations. Those who wish to receive this bulletin must send their request directly to

MAGSAT Bulletin
Missions Utilization Office
NASA-GSFC, Code 902
Greenbelt, MD 20771, U.S.A.

International Geophysical Calendar for 1980

(See other side for information on the use of this Calendar)

JANUARY							FEBRUARY							MARCH							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4	5						1	2							1
6	7	8	9	10	11	12	3	4	5	6	7	8	9	2	3	4	5	6	7	8	
13	14	15	16	17	18	19	10	11	12	13	14	15	16	9	10	11	12	13	14	15	
20	21	22	23	24	25	26	17	18	19	20	21	22	23	16	17	18	19	20	21	22	
27	28	29	30	31			24	25	26	27	28	29		23	24	25	26	27	28	29	
														30	31						

APRIL							MAY							JUNE							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4	5					1	2	3							
6	7	8	9	10	11	12	4	5	6	7	8	9	10	1	2	3	4	5	6	7	
13	14	15	16	17	18	19	11	12	13	14	15	16	17	8	9	10	11	12	13	14	
20	21	22	23	24	25	26	18	19	20	21	22	23	24	15	16	17	18	19	20	21	
27	28	29	30				25	26	27	28	29	30	31	22	23	24	25	26	27	28	
														29	30						

JULY							AUGUST							SEPTEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4	5						1	2							
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13	
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20	
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27	
27	28	29	30	31			24	25	26	27	28	29	30	28	29	30					
							31														

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4						1								
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31			
							30													

JANUARY 1981						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

- ⑰ Regular World Day (RWD)
- ⑭ Priority Regular World Day (PRWD)
- ⑬ Quarterly World Day (QWD) also a PRWD and RWD
- 2 Regular Geophysical Day (RGD)
- ⑩ Day of Solar Eclipse
- 16* Dark Moon Geophysical Day (DMGD)
- 7-8 World Geophysical Interval (WGI)
- 6-7 Airglow and Aurora Period
- 3, 27 Day with unusual meteor shower activity, Northern, [or Southern,] Hemisphere

- NOTES:**
- Solar Maximum Year continues throughout the year.
 - Flare Buildup Study (FBS) Alert Period May-June, 1980.
 - Study of Energy Release in Flares (SERF) Alert Period September 15 - October 15, 1980.
 - IAGA/URSI Working Group on Passive Electromagnetic Probing of the Magnetosphere International Campaign June 22 - July 19, 1980.
 - Middle Atmosphere Program, MAP, will have:
 - Preliminary Map Project-1 Coordinated Study of the Behavior of the Middle Atmosphere in Winter continues January-March 1980.
 - Preliminary Map Project-2 Equatorial Wave Dynamics throughout 1980 corresponding to NIMBUS-G observations.
 - Preliminary Map Project-3 Study of Photochemical Processes in the Upper Stratosphere and Mesosphere by Complementary Spacecraft, in Situ and Ground Measurements - July 1980.

EXPLANATIONS

This Calendar continues the series begun for the IGY years 1957-58, and is issued annually to recommend dates for solar and geophysical observations which cannot be carried out continuously. Thus, the amount of observational data in existence tends to be larger on Calendar days. The recommendations on data reduction and especially the flow of data to World Data Centers (WDCs) in many instances emphasize Calendar days. The Calendar is prepared by the International Ursigram and World Days Service (IUWDS) with the advice of spokesmen for the various scientific disciplines. For greater detail concerning explanations or recommendations your attention is called to information published periodically in STP Notes, IAGA News, IUGG Circulars, URSI Information Bulletin or other scientific journals.

The definitions of the designated days remain as described on previous Calendars. Universal Time (UT) is the standard time for all world days. Regular Geophysical Days (RGD) are each Wednesday. Regular World Days (RWD) are three consecutive days each month, always Tuesday, Wednesday and Thursday near the middle of the month. Priority Regular World Days (PRWD) are the RWD which fall on Wednesdays. Quarterly World Days (QWD) are one day each quarter and are the PRWD which fall in the World Geophysical Intervals (WGI). The WGI are fourteen consecutive days in each season, beginning on a Monday of the selected month, and normally shift from year to year. In 1980 the WGI will be January, April, July and October.

The Solar Eclipses are February 16 (total) beginning in the South Atlantic Ocean, crossing Africa south of the equator, the Arabian Sea, the southern part of India and ending in the southern part of China, and August 10 (annular) beginning in the South Pacific Ocean north of the Phoenix Islands, crossing the central part of the Pacific Ocean, Peru, Bolivia, Paraguay and ending in southeastern Brazil.

Meteor Showers (selected by P. M. Millman, Ottawa) include important optical showers and also unusual showers observable mainly by radio and radar techniques. The dates are coded to indicate whether the shower is observable in the northern or southern hemisphere.

The occurrence of unusual solar or geophysical conditions is announced or forecast by the IUWDS through various types of geophysical "Alerts" which are widely distributed by telegram and radio broadcast on a current schedule. Stratospheric warnings (STRATWARM) are also designated. The meteorological telecommunications network coordinated by WMO carries three worldwide Alerts once daily soon after 0400 UT. For definitions of Alerts see IUWDS "Synoptic Codes for Solar and Geophysical Data, Third Revised Edition, 1973" and its amendments. Retrospective World Intervals are selected and announced in STP Notes and elsewhere to provide additional analyzed data for particular events studied in the ICSU Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) programs.

RECOMMENDED SCIENTIFIC PROGRAMS OPERATIONAL EDITION

(The following material was reviewed in 1979 by spokesmen of INAG, WMO, COSPAR, and IAU as suitable for coordinated geophysical programs in 1980.)

Airglow and Auroral Phenomena. Airglow and auroral observatories operate with their full capacity around the New Moon periods. However, for progress in understanding the mechanism of, inter alia, low latitude aurora, the coordinated use of all available techniques, optical and radio, from the ground and in space is required. Thus, for the airglow and aurora 7-day periods on the Calendar, ionosonde, incoherent scatter, special satellite or balloon observations, etc., are especially encouraged. Periods of approximately two weeks' duration centered on the New Moon are proposed for high resolution studies of ionospheric, auroral and magnetospheric observations at high latitudes during northern winter.

Atmospheric Electricity. Not-continuous measurements and data reduction for continuous measurements of atmospheric electric current density, field, conductivities, space charges, ion number densities, ionosphere potentials, condensation nuclei, etc.; both at ground as well as with radiosondes, aircraft, rockets; should be done with first priority on the RGD each Wednesday, beginning on 2 January 1980 at 1200 UT, 9 January at 1800 UT, 16 January at 0000 UT, 23 January at 0600 UT, 30 January at 1200 UT, etc. (beginning hour shifts six hours each week, but is always on Wednesday). Minimum program is at the same time on PRWD beginning with 16 January at 0000 UT. Data reduction for continuous measurements should be extended, if possible, to cover at least the full RGD including, in addition, at least 6 hours prior to indicated beginning time. Measurements prohibited by bad weather should be done 24 hours later. Results on sferics and ELF are wanted with first priority for the same hours, short-period measurements centered around the minutes 35-50 of the hours indicated. Priority Weeks are the weeks which contain a PRWD, minimum priority weeks are the ones with a QWD. The World Data Centre for Atmospheric Electricity, 7 Karbysheva, Leningrad 194018, USSR, is the collection point for data and information on measurements.

Geomagnetic Phenomena. It has always been a leading principle for geomagnetic observatories that operations should be as continuous as possible and the great majority of stations undertake the same program without regard to the Calendar.

Stations equipped for making magnetic observations, but which cannot carry out such observations and reductions on a continuous schedule are encouraged to carry out such work at least on RWD (and during times of MAGSTORM Alerts).

The International Ursigram and World Days Service (IUWDS) is a permanent scientific service of the International Union of Radio Science (URSI), with the participation of the International Astronomical Union and the International Union of Geodesy and Geophysics. IUWDS adheres to the Federation of Astronomical and Geophysical Services of the International Council of Scientific Unions. The IUWDS coordinates the international aspects of the world days program and rapid data interchange, and also publishes subsequently Condensed Calendar Records of solar and geophysical indices and events, published in STP Notes.

This Calendar for 1980 has been drawn up by J. V. Lincoln, of the IUWDS Steering Committee, in close association with A. H. Shapley, Chairman of MONSEE of SCOSTEP, and spokesmen for the various scientific disciplines in SCOSTEP and COSPAR. Similar Calendars have been issued annually beginning with the IGY, 1957-58, and have been published in various widely available scientific publications.

Published for the International Council of Scientific Unions with the financial assistance of UNESCO. UNESCO Subvention 1979 DG/2-11414/471.

Additional copies are available upon request to IUWDS Chairman, Dr. P. Simon, Ursigrammes Observatoire, 92190 Meudon, France, or IUWDS Secretary for World Days, Miss J. V. Lincoln, WDC-A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80303, U.S.A.

Ionospheric Phenomena. Special attention is continuing on particular events which cannot be forecast in advance with reasonable certainty. These will be identified by Retrospective World Intervals. The importance of obtaining full observational coverage is therefore stressed even if it is possible to analyze the detailed data only for the chosen events. In the case of vertical incidence sounding, the need to obtain quarter-hourly ionograms at as many stations as possible is particularly stressed and takes priority over recommendation (a) below when both are not practical.

For the vertical incidence (VI) sounding program, the summary recommendations are: (a) all stations should make soundings at least every quarter hour. Stations which normally record at every quarter should, if possible, record more frequently on RWDs; (b) all stations are encouraged to make f-plots on RWDs; f-plots should be made for high latitude stations, and for the so-called "representative" stations at lower latitudes for all days (i.e., including RWDs and WGIs). (Continuous records of ionospheric parameters are acceptable in place of f-plots at temperate and low latitude stations); (c) all stations are encouraged to make profile parameters on RWDs and include them in data sent to WDCs except for stations which already undertake full profile programs or produce monthly median profiles for synoptic purposes; (d) copies of hourly ionograms with appropriate scales for RWDs are to be sent to WDCs; (e) stations in the eclipse zone and its conjugate area should take continuous observations on solar eclipse days and special observations on adjacent days. See also recommendations under Airglow and Auroral Phenomena.

For incoherent scatter observation program, every effort should be made to obtain measurements at least on the Dark Moon Geophysical Days (DMGD) and intensive series should be attempted whenever possible in WGIs or the Airglow and Aurora Periods. The need for collateral VI observations with not more than quarter-hourly spacing at least during all observation periods is stressed. Dr. P. Bauer (France), URSI Working Group G.3, is coordinating special programs.

For the ionospheric drift or wind measurement by the various radio techniques, observations are recommended to be concentrated on the weeks including RWDs.

For traveling ionosphere disturbances propose special periods for coordinated measurements of gravity waves induced by magnetospheric activity, probably on selected PRWD and RWD.

For the ionospheric absorption program half-hourly observations are made at least on all RWDs and half-hourly tabulations sent to WDCs. Observations should be continuous on solar eclipse days for stations in eclipse zone and in its conjugate area. Special efforts should be made to obtain daily absorption measurements at temperate latitude stations during the period of Absorption Winter Anomaly, particularly on days of abnormally high or abnormally low absorption (approximately October-March, Northern Hemisphere; April-September, Southern Hemisphere).

For back-scatter and forward-scatter programs, observations should be made and analyzed on all RWDs at least.

For synoptic observations of mesospheric (D region) electron densities, several groups have agreed on using the RGD for the hours around noon. For ELF noise measurements involving the earth-ionosphere cavity resonances any special effort should be concentrated during the WGIs.

It is recommended that more intensive observations in all programs be considered on days of unusual meteor activity.

Meteorology. Particular efforts should be made to carry out an intensified program on the RGD — each Wednesday, UT. A desirable goal would be the scheduling of meteorological rocketsondes, ozone sondes and radiometer sondes on these days, together with maximum-altitude rawinsonde ascents at both 0000 and 1200 UT.

During WGI and STRATWARM Alert intervals, intensified programs are also desirable, preferably by the implementation of RGD-type programs (see above) on Mondays and Fridays, as well as on Wednesdays.

Solar Phenomena. The Solar Maximum Year continues through 1980. Special periods are planned for the Flare Buildup Study (FBS) and Study of Energy Release in Flares (SERF), see below Calendar for dates. Observatories making specialized studies of solar phenomena, particularly using new or complex techniques, such that continuous observation or reporting is impractical, are requested to make special efforts to provide to WDCs data for solar eclipse days, RWDs, and during PROTON/FLARE ALERTS. The attention of those recording solar noise spectra, solar magnetic fields and doing specialized optical studies is particularly drawn to this recommendation.

Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy. Experimenters should take into account that international effort in other disciplines tends to be intensified on the days marked on the Calendar, and schedule balloon and rocket experiments accordingly if there are no other geophysical reasons for choice. In particular it is desirable to make rocket measurements of ionospheric characteristics on the same day at as many locations as possible; where feasible, experimenters should endeavor to launch rockets to monitor at least normal conditions on the Quarterly World Days (QWD) or on RWDs, since these are also days when there will be maximum support from ground observations. Also, special efforts should be made to assure recording of telemetry on QWD and Airglow and Aurora Periods of experiments on satellites and of experiments on spacecraft in orbit around the sun.

For the URSI/IAGA Working Group on Passive Electromagnetic Probing of the Magnetosphere augmented synoptic recordings are called for June 22 - July 19.

SHORT ARTICLES FOR MAGNETIC-FIELD OBSERVATIONS

The IAGA Working Group V-1 on Geomagnetic Observatories, Instruments and Standards (which was formed after the amalgamation of the previous IAGA Working Groups V-1 and V-3) submitted the following two short articles which contribute to the observation of magnetic field variations.

IAGA NEWS No. 18 (February 1980)

SEASONAL VARIATIONS IN THE LA COUR BASELINE VALUES AT SCOTT BASE, ANTARCTICA

Thelma A. Rodgers

PEL Geophysical Observatory
P.O. Box 2111, Christchurch, New Zealand

INTRODUCTION

The Scott Base Magnetic Observatory is on Ross Island in the Antarctic at latitude -77° Geographic and -79° Geomagnetic. It is administered by New Zealand.

A large and regular seasonal variation in the baseline values obtained at Scott Base has been noted for some years, but detailed observations have not been possible until the author was present at the observatory for an extended period in 1978-1979. Upon return to New Zealand in October 1979 a very preliminary investigation of the data was initiated, and the results are summarised herein.

The Scott Base Magnetic Observatory was established in 1957 for the IGY years at Pram Point, which lies on the eastern side of the Hut Point Peninsula at the most southerly extension of Ross Island (Gerard, 1958). The site is a most unsatisfactory place for a magnetic observatory, being composed of loose basalt scoria which is highly magnetic, but other considerations determined the siting of the base. There is a large magnetic anomaly over the base with a difference of 500nT being observed between the variometer hut and the absolute hut 25m apart. Construction of the huts was carefully scrutinised to ensure no magnetic materials were used.

The variometers are of the La Cour type, recording X, Y and Z, and a QHM and Proton Magnetometer are used for absolute observations.

SCOTT BASE GEOMAGNETIC FIELD-MONTHLY MEAN BASELINES

BASELINE = ABSOLUTE VALUE (nT) - ORDINATE (nT)

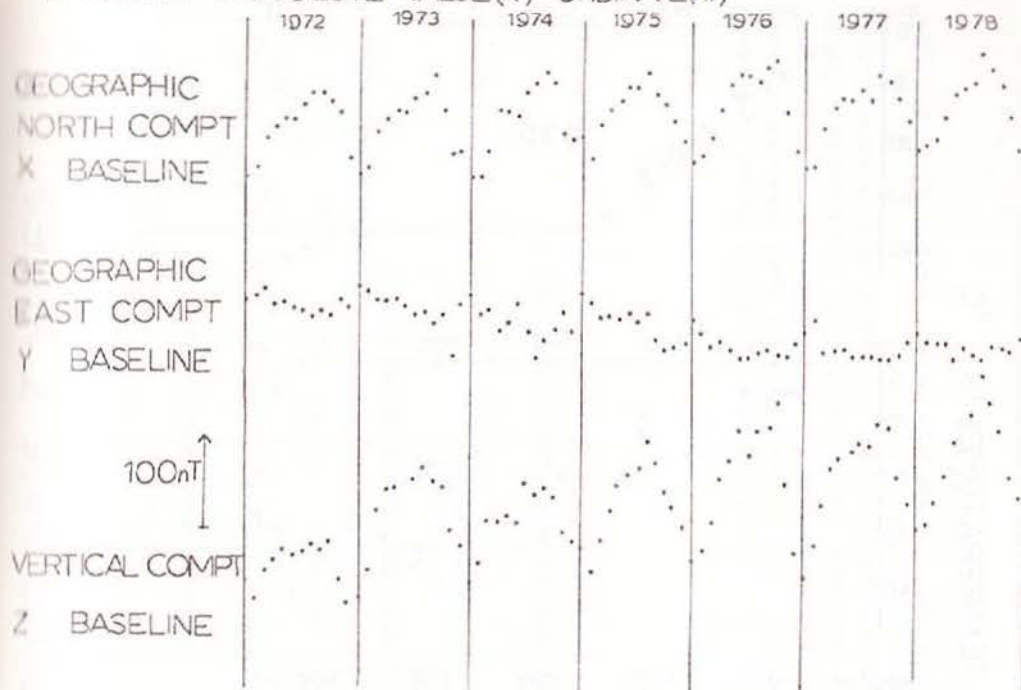


FIG. 1. Scott Base Monthly Mean Baselines 1972-1978. Vertical lines dividing years correspond to month of January.

ANALYSIS OF DATA

Figure 1 shows the monthly mean baseline values in X, Y and Z for the years 1972 to 1978. The seasonal effect is strong in the X and Z components but weaker in the Y component. The amplitude of the effect varies from year to year in any one component, but the ratio between the amplitude of one component and another stays reasonably constant for any one year. This suggests that the same mechanism is responsible for the effect in all three components.

To check whether there were any errors in the instrumental constants used in past years tests were made to redetermine them. They were found to be correct. In any case the temperature in the variometer hut is kept thermostatically controlled to within a few degrees and the large variation seen is unlikely to arise from the small changes that do occur.

However the individual baseline values did seem to show some correspondence with the outside temperature. Graphs were drawn of the Z baseline values versus mean temperatures derived from the daily maxima and minima for periods of one, three, seven, fourteen and twentyone days prior to the absolute observation. The graphs versus 14 day mean temperatures showed the minimum amount of scatter and three typical years are shown in Figure 2.

SCOTT BASE Z BASELINE STUDY

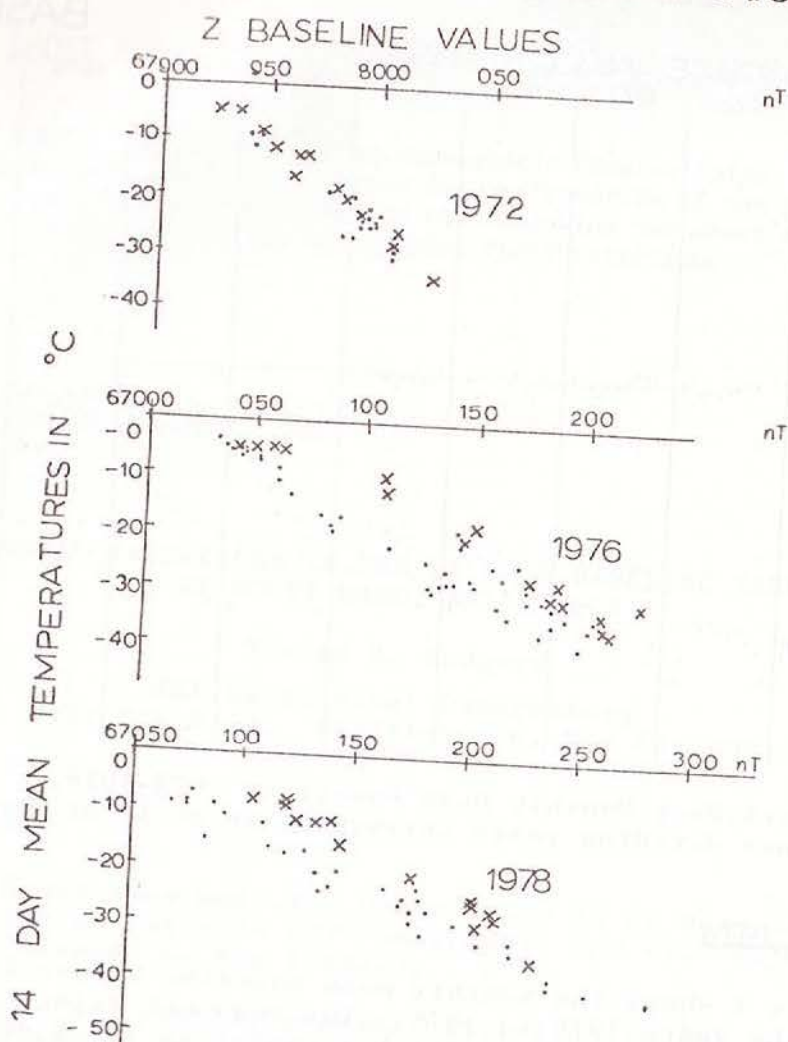


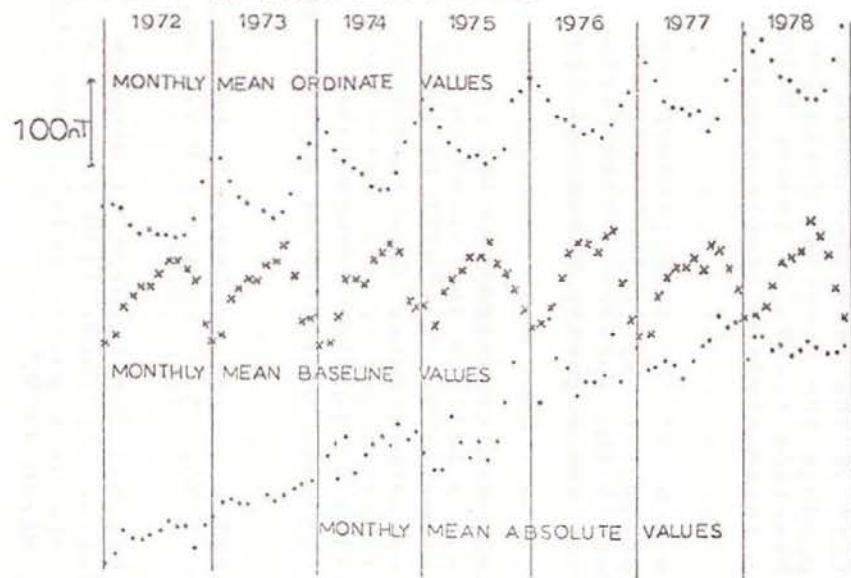
FIG. 2. Scott Base Baseline Values versus preceding 14 day mean temperatures in °C. No correction has been made for baseline drift, or for instrument adjustments made between 1972 and 1976.
 x - September to December temperatures.

Using the thermal diffusivity figures for ice and basalt this time lag suggests the effect may arise from a depth of 0.5m to 1.5m below the ground as a result of the annual temperature variation.

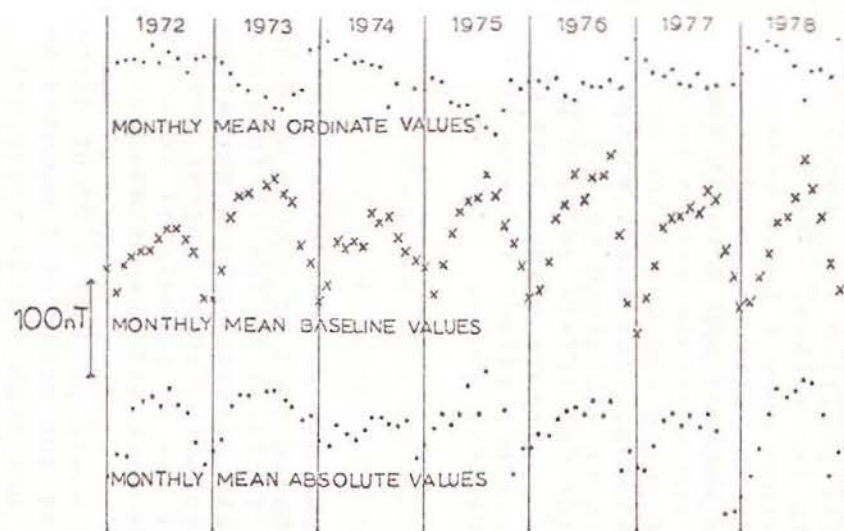
We can examine the spatial distribution of the effect over the observatory area by looking at the ordinate values and the absolute values. The monthly mean ordinate values indicate changes at the variometer house, the monthly mean absolute values show changes at the absolute house while the baselines show the difference between the two sites. Figure 3 shows these values separately for each component.

The effect is clearly at the variometer house in the X

SCOTT BASE X VALUES



SCOTT BASE Z VALUES



SCOTT BASE Y VALUES

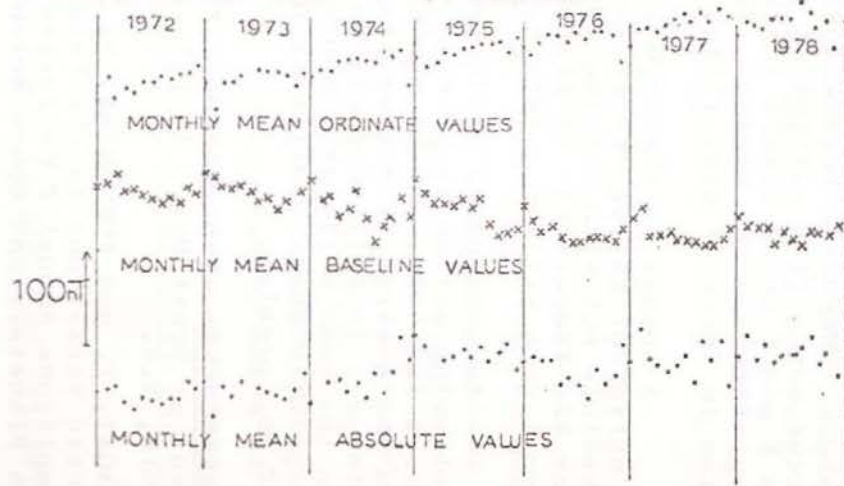


FIG. 3. Scott Base Monthly Mean Ordinate Values, Baseline Values and Absolute Values for components X, Y and Z. All values corrected for variometer temperature. Secular variation (linear approximation) removed from Z values. Vertical lines dividing years correspond to month of January.

component but in the Y component its position is inconclusive as it is obscured by the scatter in the values. The Z component monthly mean absolute values show a large seasonal variation at the absolute house but the extremes tend to occur at the solstices instead of at the warmest and coldest times as shown in the baseline values. The absolute values in fact show the typical large amplitude Z polar cap variation such as discussed by Nagai and Fukushima (1979). The small variations in the Z ordinate values could then be explained as the difference between the known Z Polar Cap effect as seen in the absolute values and the supposed temperature effect with which it is out of phase, i.e. the temperature effect is seen at the variometer house but not at the absolute house.

DISCUSSION

From the above analysis we can now say the effect has a relationship with a temperature change such as occurs at 0.5m to 1.5m depth and that the effect is local to the variometer hut. This discounts any large scale effect such as variations due to ice thickness. The most probable causes appear now to be movement of the variometer pier due to permafrost action or a change of magnetic moment of the rock with temperature.

A variometer pier tilt that would produce a 200nT difference in the Z component would be of the order of 7 minutes in the Magnetic East-West direction, but such a tilt would not account for the observed movement in the X and Y ordinate values. Magnetic North-South tilts of the same pier could also occur but a tilt sufficient to produce the observed deviation in X and Y would result in the baseline traces no longer being registered on the record. There is no obvious simple explanation in terms of pier tilts.

A change in the magnetic moment of the rock presupposes a different geology under the variometer hut to that near the absolute hut with nothing obvious on the surface. Exact values for the temperature coefficient of the magnetic moment of the local rock will be determined.

As a result of this preliminary investigation the following action is planned. Levels will be installed on the piers for 1980, and proton magnetometer surveys will be made in the general area over the temperature range from summer to winter. Installation of another variometer on a different pier in the same variometer house will give further information. Hopefully these additional observations will lead to a solution of the problem.

REFERENCES - V.B. GERARD. "Installation of Geomagnetic Equipment at Scott Base, 1957." Report No. 25, Geophysics Division, DSIR, N.Z.

NAGAI, T. and FUKUSHIMA, N. "Seasonal Dependences of Geomagnetic Variations in the Polar Regions in Connection with Large Amplitude Annual Z Variation at the Geomagnetic Pole", submitted to Planetary and Space Science, March 1979.

TURBOMAG: A SMALL ABSOLUTE VECTOR MAGNETOMETER

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At the Grenoble IUGG General Assembly Usher and Reid^{1,2)} presented a highly accurate vector magnetometer of rather new design. The principle of this instrument is closely related to that of the classical earth-inductor. A somewhat similar but much smaller instrument, the Vantson "NEW Probe"³⁾, is available commercially. In these two instruments an annular single-turn rotor, similar in principle to the one sketched in Fig. 1, is sent into rotation pneumatically. Any field component perpendicular to the axis of rotation induces currents in the metallic rotor. These currents then induce a voltage in a multi-turn stator, at twice the frequency of rotation. The signal output is therefore a maximum when the rotation axis is at right angles to the ambient field, whereas it disappears when this axis is rotated parallel to the field.

The Usher and Reid^{1,2)} instrument is designed specifically as a high-accuracy vector magnetometer. It is rather large in size and is meant as an observatory standard for baseline calibrations. It is constructed, therefore, with the utmost mechanical precision to ensure maximum stability of the axis of rotation, whose direction can be determined extremely accurately by methods of autocollimation with theodolites. In actual operation the axis of rotation is set close to the direction of the ambient field, but remains fixed. The signal is then nulled by means of compensating Helmholtz coils. The instrument operates at spinning rates of up to 80 Hz, achieving then a maximum directional sensitivity of about 0.6 arc-seconds (0.6").

The Vantson³⁾ sensor, on the other hand, is designed primarily

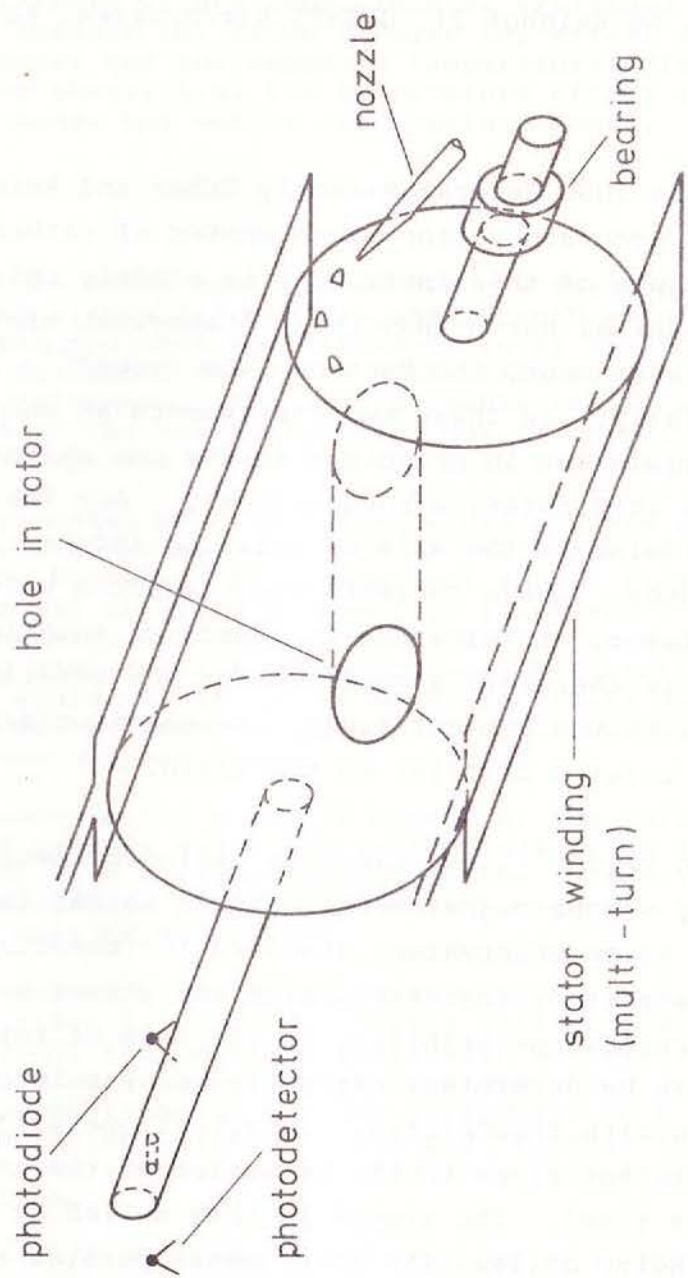


Fig. 1: Sketch of the Turbomag vector magnetometer.

Fig. 1

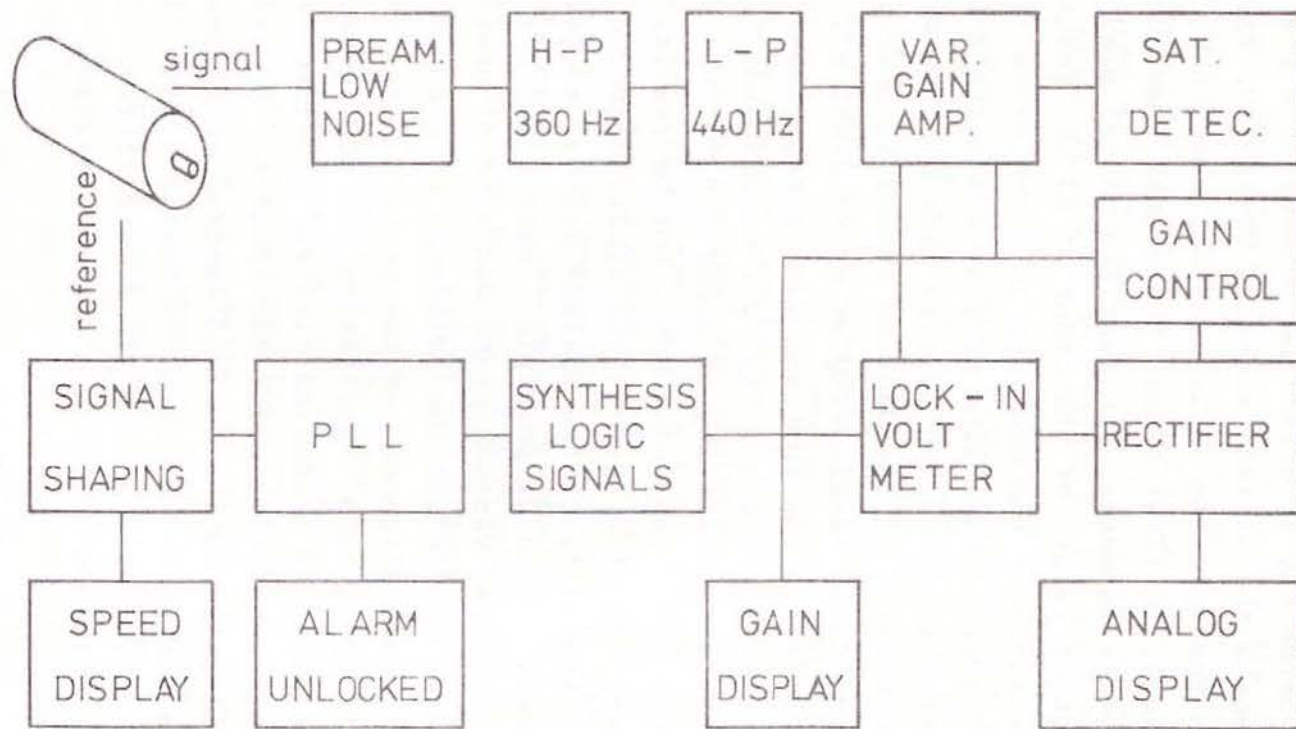


Fig. 2: Schematic diagram of Turbomac electronics.

Fig.2

to measure very weak fields, as for example in space exploration. In general, therefore, its spinning axis is set at right angles to the field. The probe may in effect be mounted on a platform which rotates and seeks the maximum signal. Obviously, for this type of application the spinning axis does not have to be particularly stable since, to first order, the signal does not decrease for small misalignments. In fact the radial play of the Vantson probe is rather large, of the order of 25 μm , resulting in an angular uncertainty of the order of 10 arc-minutes (10'). Furthermore, in a gravity field, like that at the earth's surface, the probe works best when its spinning axis lies horizontally. The directional instability of the Vantson sensor is unfortunate, because its very high field sensitivity of up to 0.005 nT, at a spinning rate of 300 Hz (18 000 rpm) and with appropriately sophisticated electronics (see, e.g., Fig. 2), corresponds "in principle" to an angular sensitivity of about 0.02". But an angular stability of this order can, of course, not be realized mechanically. However, the high theoretical limit, compared with the low 10' angular stability of the Vantson sensor, suggests that mechanical improvement should be possible. Because of its small size and weight an improved Vantson probe would be of great interest, since it could be mounted on the telescope of a non-magnetic theodolite. After proper alignment of the probe's rotation axis with the telescope's optic axis, declination and inclination could be read off the theodolite's graduated circles, provided of course a reference azimuth were available for declination. However, the Vantson probe is ill-suited for the desired improvements, precisely because the probe's design is not directed toward a high directional stability, but only toward a high field sensitivity. This explains why an entirely new design was deemed necessary.

The prototype vector magnetometer we have built and which we shall baptize Turbomag, works on the same physical principle as the Usher and Reid^{1, 2)} magnetometer or the Vantson³⁾ probe, and is likewise powered pneumatically. However, the actual design, sketched in Fig. 1, is quite different from these two instruments.

The cylindrical rotor body is machined together with its axles from a single piece of high-purity copper. A hole is bored at a right angle to the axis through the cylinder to provide the single-turn rotor. The multi-turn stator is rigidly imbedded into an epoxy resin and encloses the rotor quite snugly. The precision non-magnetic bearings are mounted under axial load. The load is adjusted so as to ensure that axial and radial play both vanish for all orientations of the probe in the earth's gravity field. But this load is still low enough that the rotor can be sent into rotation pneumatically with a pressure of only 0.5 bar (7 psi) and a gas flow of about 4 lt/min (about 9 cu ft/hr). The gas streams from a carefully adjusted nozzle, impinging on one of the end-faces of the rotor cylinder in which little cups have been hollowed out (cf. Fig. 1). The speed of rotation can be adjusted, but varying the gas pressure, up to at least 20 000 rpm, although we have usually operated the prototype at 200 Hz (12 000 rpm). The gas then leaves the probe without streaming through the precision bearings, to minimize the possibility of introducing dust particles into the bearings. Nevertheless, high-purity gas is used, preferable CO₂ which can be stored in liquid form in non-magnetic aluminium bottles, thus greatly reducing the distance necessary between gas supply and magnetometer.

One of the axles is made much longer than the other and can be sighted from outside the instrument after removal of a cap. This axle extremity is machined to yield a highly reflecting surface. This makes it possible to align the rotor axis with the optic axis of the telescope by autocollimation techniques. The instrument thus becomes an absolute instrument as it needs no magnetic calibration as far as directionality is concerned: all adjustments can be made by optical and mechanical means to accuracies of the order of one arc-second. Close to the extremity of the long axle a small hole is drilled through the axle. A miniature photodiode and photodetector placed symmetrically with respect to the axle then yield the reference signal necessary for synchronous phase-sensitive detection of the main signal. A schematic

diagram of our electronics is given in Fig. 2. The sensitivity of our prototype is $0.25 \mu\text{V}$ (peak to peak) per nT at 200 Hz rotation speed.

Our prototype Turbomag has been mounted on a Zeiss-Jena⁴⁾ 020-A non-magnetic theodolite. The circles of this theodolite are graduated in one-minute intervals and readings are made to a tenth of a minute, i.e., 6". Our tests have shown that the stability of the rotation axis is better than 6" and that reproducibility probably also exceeds the capacity of the theodolite. It is clear, therefore, that the Turbomag is not just an accurate absolute field instrument, but satisfies the requirements of most observatory standards as an absolute instrument for baseline calibrations. Because the Turbomag will usually be mounted on a theodolite, it can easily be combined with a gyroscope, like the Wild GAK-1 theodolite gyroscope⁵⁾. Note however that magnetic North must be sought with the Turbomag without placing the gyroscope on the theodolite, because gyroscopes are usually magnetic. The gyroscope is used before or after the Turbomag to find true or geographic North. With a gyroscope one becomes independent of any reference azimuth and can operate in complete darkness, as for example in tunnels and caves, since the telescope is not needed and the theodolite graduated circles can easily be lit artificially. The accuracy of the gyroscope is about $\pm 12''$, and thus somewhat below that of the magnetometer.

Finally we should also like to mention that our magnetometer is a "real-time" instrument, yielding inclination and declination at the time when a null reading is achieved. Only one reading is necessary, so that there is no averaging, nor any internal reduction during the measurement process to cancel the field variations while the various steps of the measuring procedure are being carried out.

So far, as we have said above, we have built and tested one prototype Turbomag. We would like, if other people are interested

in this instrument, to build a small series of such instruments. The cost of the Turbomag, with associated electronics, but without gas supply, is estimated at about Sw.Fr. 8 000.-. A non-magnetic Zeiss-Jena⁴⁾ 020-A theodolite costs about Sw.Fr. 6 500.-. To mount the Turbomag on the telescope and perform the alignment between the two may cost about Sw.Fr. 1 500.-. The optional Wild⁵⁾ gyroscope with the necessary mounting bridge that has to be added to the Zeiss theodolite would cost about Sw.Fr. 27 000.-. To help anyone interested in the Turbomag we recapitulate below the characteristics of this instrument.

REFERENCES

- [1] Usher, M.J. and Reid, J.P.: An Absolute Vector Magnetometer. Abstract SM-13, p. 133 of IAGA Bulletin No. 36: Program and Abstracts XVI IUGG General Assembly, Grenoble 1975.
- [2] Usher, M.J. and Reid, J.P.: An Absolute Vector Magnetometer. J. Phys. E: Sci. Instrum., vol. 11, pp. 1169-1172 (1978).
- [3] Vantson NEW (Nulling, Eddy-current, Wind-driven) Probe: Vantson Enterprises, P.O. Box 673, ARCADIA, Ca-91006, USA.
- [4] Theodolite THEO-020-A (non-magnetic version): VEB Carl Zeiss Jena, Betrieb für Export und Import, Handelsbereich 1, DDR-69 JENA.
- [5] Gyroscope attachment WILD-GAK-1: Wild-Heerbrugg A.G., CH-9435 HEERBRUGG, Switzerland.

Characteristics of the Turbomag Vector Magnetometer

Principle of operation:	Similar to earth-inductor
Power Source:	Compressed air or CO ₂ , 4 lt/min, 0.5 bar
Speed of rotation:	12'000 rpm in normal operation, up to 20'000 rpm possible
Sensitivity at 12'000 rpm:	0.25 μ V (peak to peak) /nT, $\propto C F^{3/2}$
Radial play of rotation axis:	Theoretically nil through axial load
Directional sensitivity:	Better than 6 arc-seconds
Reproducibility:	Better than 6 arc-seconds
Alignment on theodolite:	Optically by autocollimation i.e. absolute
Magnetic azimuth and inclination:	Direct readings on non-magnetic theodolite graduated circles, to 6 arc-seconds
Absolute declination:	Determined with gyroscope (optional)
Dimensions and weight:	$\emptyset = 4.0$ cm L = 9.0 cm W = 350 gr.
Prices:	
Turbomag with electronics (without compressed gas supply)	Sw.Fr. 8 000.-
Non-magnetic theodolite	Sw.Fr. 6 500.-
Mounting and aligning Turbomag on theodolite	Sw.Fr. 1 500.-
Gyroscope (accessory to theodolite)	Sw.Fr. 27 000.-
Exchange rate: Sw.Fr./US\$ = 1.55(selling)-1.75(buying), Jan. 1980	

Where to inquire: Dr. G. Fischer
 Observatoire Cantonal
CH-2000 Neuchâtel / Switzerland

ESTABLISHMENT OF IUGG IN 1919 and IAGA EXECUTIVE COMMITTEE SINCE 1919

The following is an extract from IAGA Bulletin No.1 (1919), which explains the establishment of IUGG and its Sections in 1919. It is seen in this document that IAGA's predecessor organization started in 1919. The list of persons who served in the IAGA Executive Committee during 1919-1979 is also shown for information.

During the meetings at Brussels, July 18-28, 1919, of the International Research Council, there were established under the auspices of the Council, new international unions of astronomy, geophysics, mathematics, physics, chemistry, geology, and scientific radio-telegraphy. The International Geodetic and Geophysical Union consisted of the following six sections, i.e.

- (A) Geodesy
- (B) Seismology
- (C) Meteorology
- (D) Terrestrial Magnetism and Electricity
- (E) Physical Oceanography
- (F) Vulcanology

[Remark] The Section on Scientific Hydrology joined later in 1922, and all seven Sections became in 1930 the seven Associations under the International Union of Geodesy and Geophysics.

The work of section D (Terrestrial Magnetism and Electricity) could be more completely organized than that of the other sections during the Brussels meeting, as it happened that there were present six members of the pre-war Magnetic Commission of the International Meteorological Committee, viz.: Angot (France), Bauer (U.S.A.), Chree (U.K.), Palazzo (Italy), Schuster (U.K.) and Tanakadate (Japan). At preliminary, informal meetings of the delegates from the various allied countries it developed that there was practically unanimity in the proposal of a section by itself which should be concerned specifically with the subjects of terrestrial magnetism and terrestrial electricity (atmospheric electricity, earth-currents, polar lights, and atmospheric-electric "strays"). The section was accordingly established at the meeting of the Union on July 23 and on July 24.

At the meeting on July 24, 1919, the Section first discussed the kind of work to be undertaken. After Dr. Chree's introduction regarding the work and status of the Executive Bureau of the pre-war International Commission on Terrestrial Magnetism it was resolved:

- I. That a Committee be appointed to consider the best method of securing an adequate comparison of the magnetic instruments in use in different countries, and to consider as to the best method of measuring the magnetic elements in absolute units.
- II. That the Section of Terrestrial Magnetism and Electricity concurs in the resolution of Meteorological Section that international work in atmospheric electricity should be as far as possible placed under the direction of a Committee nominated partly by the Section of Terrestrial Magnetism and Electricity, and partly by the Section of Meteorology.

IAGA EXECUTIVE COMMITTEES since 1919

<u>Period</u>	<u>President</u>	<u>Vice-Presidents</u>	<u>Secretary</u>	<u>Members</u>			
1919-1922	A. Tanakadate (Japan)	C. Chree (U.K.)	L.A. Bauer (U.S.A.)				
1922-1927	C. Chree (U.K.)	L. Palazzo (Italy)	L.A. Bauer (U.S.A.)	J. Jaumotte (Belgium)	Ch. Maurain (France)	A. Tanakadate (Japan)	
1927-1930	L.A. Bauer (U.S.A.)	V. Carlheim-Gyllensköld (Sweden)	Ch. Maurain (France)	C. Chree (U.K.)	J. Jaumotte (Belgium)	L. Palazzo (Italy)	A. Tanakadate (Japan)
1930-1933	J.A. Fleming (U.S.A.)	V. Carlheim-Gyllensköld (Sweden)	Ch. Maurain (France)	D. La Cour (Denmark)	J. Jaumotte (Belgium)	A. Crichton-Mitchell (U.K.)	
				L. Palazzo (Italy)	A. Tanakadate (Japan)		
1933-36	J.A. Fleming (U.S.A.)	V. Carlheim-Gyllensköld (Sweden)	D. La Cour (Denmark)	J. Agostinho (Portugal)	S. Chapman (U.K.)	A. Crichton-Mitchell (U.K.)	
		Ch. Maurain (France)		C. Störmer (Norway)	A. Tanakadate (Japan)		
1936-1939	J.A. Fleming (U.S.A.)	Ch. Maurain (France)	A.H.R. Goldie (U.K.)	A. Crichton-Mitchell (U.K.)	G. van Dijk (Netherlands)	J. Keränen (Finland)	
1939-1948		S. Chapman (U.K.)		C. Störmer (Norway)	A. Tanakadate (Japan)		
1948-1951	S. Chapman (U.K.)	J. Coulomb (France)	J.W. Joyce (U.S.A.)	S.K. Banerji (India)	L.V. Berkner (U.S.A.)	J.A. Fleming (U.S.A.)	
		B.F.J. Schonland (South Africa)		V. Laursen (Denmark)	O. Lützow-Holm (Argentina)	D.F. Martyn (Australia)	
1951-1954	J. Coulomb (France)	J. Bartels (FR Germany)	V. Laursen (Denmark)	A.A. Giesecke, Jr. (Peru)	M. Hasegawa (Japan)	J. Kaplan (U.S.A.)	
		S. Chapman (U.K.)		S.L. Malurkar (India)	J.H. Rayner (Australia)		

<u>Period</u>	<u>President</u>	<u>Vice-Presidents</u>	<u>Secretary</u>	<u>Members</u>		
1954-1957	J. Bartels (FR Germany)	J. Kaplan (U.S.A.) J.M. Rayner (Australia)	V. Laursen (Denmark)	S. Chapman (U.K.) M. Nicolet (Belgium)	J. Coulomb (France) E.B. Roberts (U.S.A.)	M. Hasegawa (Japan) L. Slaucitajs (Argentina)
1957-1960	J. Kaplan (U.S.A.)	A.G. Kalashnikov (U.S.S.R.) V. Laursen (Denmark)	J.O. Cardus (Spain)	J. Bartels (FR Germany) J.M. Rayner (Australia)	T. Nagata (Japan) O. Schneider (Argentina)	M. Nicolet (Belgium) E. Thellier (France)
1960-1963	V. Laursen (Denmark)	M. Nicolet (Belgium) N.V. Pushkov (U.S.S.R.)	J.O. Cardus (Spain)	J. Bartels (FR Germany) T. Nagata (Japan)	J. Bouska (Czechoslovakia) O. Schneider (Argentina)	J. Kaplan (U.S.A.) E. Thellier (France)
1963-1967	M. Nicolet (Belgium)	T. Nagata (Japan) J.O. Cardus (Spain)	L.R. Alldredge (U.S.A.)	H. Friedman (U.S.A.) J.G. Roederer (Argentina)	S.I. Isaev (U.S.S.R.) E. Thellier (France)	V. Laursen (Denmark) J. Veldkamp (Netherlands)
1967-1971	T. Nagata (Japan)	V.A. Troitskaya (U.S.S.R.) E. Thellier (France)	L.R. Alldredge (U.S.A.)	M. Nicolet (Belgium) F.S. Johnson (U.S.A.)	J.O. Cardus (Spain) J.G. Roederer (U.S.A.)	R.M. Casaverde (Peru) R. Turajlic (Yugoslavia)
1971-1975	V.A. Troitskaya (U.S.S.R.)	G.M. Weill (France) J.G. Roederer (U.S.A.)	L.R. Alldredge (U.S.A.)	A.J. Dessler (U.S.A.) M. Nicolet (Belgium)	J.W. Dungey (U.K.) O. Schneider (Argentina)	T. Nagata (Japan) R. Turajlic (Yugoslavia)
1975-1979	J.G. Roederer (U.S.A.)	G.M. Weill (France) K.D. Cole (Australia)	N. Fukushima (Japan)	M. Ackerman (Belgium) A.J. Dessler (U.S.A.)	L.R. Alldredge (U.S.A.) M. Gadsden (U.K.)	V. Bucha (Czechoslovakia) V.A. Troitskaya (U.S.S.R.)
1979-1983	K.D. Cole (Australia)	A.J. Dessler (U.S.A.) M. Gadsden (U.K.)	N. Fukushima (Japan)	V. Bucha (Czechoslovakia) V.A. Troitskaya (U.S.S.R.)	C.-G. Pålthammar (Sweden) D.A. Valencio (Argentina)	J.G. Roederer (U.S.A.) D.J. Williams (U.S.A.)

- III. That the Section of Terrestrial Magnetism and Electricity would welcome co-operation with the International Union of Scientific Radio-Telegraphy in the investigation of electric phenomena of the higher atmosphere.
- IV. That a Committee be appointed on the systematic exchange of magnetic curves.
- V. That special Committees be appointed from time to time for the investigation and report on specific problems in terrestrial magnetism and electricity.
- VI. That the Section of Terrestrial Magnetism and Electricity would welcome co-operation with the International Astronomical Union in investigating the relationships between solar and terrestrial magnetic and electric phenomena.
- VII. That the ex-officio members of the Executive Committee be empowered to elect additional members to serve until the next ordinary meeting of the Union.
- VIII. That the Executive Committee consult with the Executive Committees of other Sections of the Union and report to the General Secretary of the Union the amount of funds annually required by the Section during the period of the present Convention.

After the Section had expressed the opinion that it would be well to defer complete organization of the Section, and of the committees to be appointed, until other countries have joined the International Geodetic and Geophysical Union, the following officers were elected in accordance with the Statutes of the Union: A. Tanakadate (Japan), president; Charles Chree (Great Britain), vice-president; Louis A. Bauer (United States of America), secretary and director of the Central Bureau.

At a meeting of the Executive Committee (at that time limited to only the president, vice-president, and secretary who is also the director of its Central Bureau) of the Section on Terrestrial Magnetism and Electricity on July 28, 1919, ten committees on the following subjects were decided upon in order to carry into effect, as soon as possible, the resolutions of July 24, i.e. (1) Comparison of magnetic instruments and methods of absolute magnetic measurements; (2) International work in atmospheric electricity; (3) Co-operative investigation with radio-telegraphists of electric phenomena of upper atmosphere; (4) Exchange and methods of measurement of magnetic curves; (5) Magnetic characterization of days; (6) Co-operative investigation of solar and terrestrial magnetic and electric phenomena; (7) Diurnal variations of terrestrial magnetic phenomena; (8) Magnetic surveys, charts, and secular variation; (9) Publication and exchange of magnetic observatory data; (10) Polar lights and earth currents. The full composition of these committees was deferred until complete organization of the Section has been effected after the entrance into the International Research Council and the Union of other countries.

The INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY (IAGA) is one of the seven Associations in the INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS (IUGG). The objectives of IAGA are:

- a) to promote studies of magnetism and aeronomy of the Earth and other bodies of the solar system, and of the interplanetary medium and its interaction with these bodies, where such studies have international interest;
- b) to encourage research in the above subjects by individual countries, institutions or persons and to facilitate its international coordination;
- c) to provide an opportunity, on an international basis, for discussion and publication of the results of the research work indicated above;
- d) to promote appropriate standardizations of observational programs, data acquisition systems, data analysis and publication.

At present the components of IAGA are as follows.

Division I: Internal Magnetic Fields,
Division II: Aeronomic Phenomena,
Division III: Magnetospheric Phenomena,
Division IV: Solar Wind and Interplanetary Magnetic Field,
Division V: Observatories, Instruments, Indices and Data,
Interdivisional Commission on Antarctic Research,
Interdivisional Commission on History,
Interdivisional Commission on the Middle Atmosphere,
Interdivisional Working Group on Relations between External and Internal Magnetic Variations.

Each Division (and some Interdivisional Commissions also) has Working Groups or Topic Groups for specific items of research.

IAGA holds its ordinary General Assembly every four years in connection with each ordinary General Assembly of IUGG. Between ordinary General Assemblies, IAGA holds a General Scientific Assembly, so that IAGA meets every other year.

IAGA has now two kinds of publications, i.e. IAGA Bulletins and IAGA News. The IAGA Bulletins include (i) Transactions of the IAGA General Assemblies; (ii) Programs and Abstracts of Papers for IAGA General Assemblies; (iii) Geomagnetic Data and Indices for each year; and (iv) Special Data Summary or Useful Information Booklet (published occasionally). In the past, some proceedings of special IAGA symposia have also been published. All of these publications are available through the IUGG PUBLICATIONS OFFICE (39 ter, Rue Gay-Lussac, 75005, Paris France).

IAGA issues an internal publication called "IAGA News" which contains various information of general interest to the IAGA community. The IAGA News is usually published on a yearly basis, and is available free of charge on request from the General Secretary of IAGA.

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REMARKS TO THE IAGA NEWS RECIPIENTS

IAGA News is usually published on a yearly basis, and it is available free of charge on request from the Secretary General of IAGA. At present it is distributed to (i) those scientists who have requested to be on the mailing list, (ii) participants of the previous IAGA Assemblies, (iii) principal observatories, and (iv) officers of the international organizations which are closely related with IAGA's scientific activities. If you know of some new colleagues (or research institutes or observatories) wishing to receive IAGA News, please let me know their names and addresses or advise them to write to me directly. Some back issues (Nos. 15, 16 and 17) of IAGA News are still available on request.

IAGA welcomes all scientists throughout the world to join in research in "Geomagnetism and aeronomy". IAGA is subdivided into Divisions and Interdivisional Bodies, many of which have Working Groups or Topic Groups for the study of specific subjects. Some of these IAGA internal bodies occasionally issue their own circulars or newsletter, and these are available on direct application to their leaders, the names of which are shown under the item "IAGA Internal Structure and Leaders" in this IAGA News.

IAGA News No.18 contains the summary of IAGA activities in connection with the XVII General Assembly of IUGG in Australia in November-December 1979, and other useful information for the IAGA community. The details of the IAGA Canberra Assembly will be published soon in the Transactions of the IAGA Canberra Assembly as IAGA Bulletin No.44. It will be distributed later free of charge to the registrants of the Canberra Assembly. Those who did not attend the Assembly but wish to purchase the Transactions are invited to send their request to the IUGG PUBLICATIONS OFFICE (39 ter, Rue-Gay-Lussac, 75005 Paris, France). The IUGG Publications Office receives orders for any other IAGA Publications on sale, including the "Program and Abstracts" booklets of the IMS Symposium (IAGA Bulletin No.42) and of the IAGA Canberra Assembly (Bulletin No.43) and the yearly publications of Geomagnetic Data and Indices (Bulletin No.32-series).

The Secretary General welcomes any comments on the IAGA News and information related to IAGA's activity, including any criticism on the arrangements of the IAGA Assembly. The recipients are also kindly asked to notify the Secretary General of any error or necessary modification or change of postal address.

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