

Resolutions adopted by the XIIIth General Assembly

(English Text)

Resolution N° 1

The International Union of Geodesy and Geophysics,

NOTING the increase in the number of applications for membership received since the last General Assembly,
EXPRESSES its satisfaction to the outgoing Bureau and
DESIRES that the incoming Bureau actively pursue the enlistment of new adherents.

Resolution N° 2

The International Union of Geodesy and Geophysics,

CONSIDERING the exceptional position of the Tamanrasset Observatory, the importance of work already carried out in Algeria in the field of geophysics, particularly during the International Geophysical Year, the importance of work which could be done there in the future, particularly during International Quiet Sun Years,
DRAWS the attention of the Bureau to Resolution N° 1 with a view to obtaining the adherence of Algeria.

Resolution N° 3

The International Union of Geodesy and Geophysics,

CONSIDERING that the interests of geochemists in the IUGG is well demonstrated by the program presented at the Berkeley Assembly and that this interest was the result of the IUGG action to form the ad hoc Committee on the Problems of Geochemistry and support its activities,

RESOLVES that the ad hoc Committee should be supported and enlarged to include representatives of IAV, IASH, IAMAP, IASPEI, IAPO, and IAGA to facilitate programs of future joint symposia.

Resolution N° 4

The International Union of Geodesy and Geophysics

INSTRUCTS the Committee on Geophysical Bibliography established at the Helsinki General Assembly to continue its work and to pursue its efforts for the implementation of Resolution N° 2 of that Assembly.

Resolution N° 5

The International Union of Geodesy and Geophysics,

RECOMMENDS to ICSU

- 1) To make the Committee for the International Quiet Sun Years independent of the Comité International de Géophysique and to take the IQSY Committee under its direct responsibility
- 2) To retain, with its own General Secretary, the Comité International de Géophysique, but restrict its future role:
 - a) to control the Annals of the International Geophysical Year
 - b) to control the World Data Centres

Resolution N° 6

The International Union of Geodesy and Geophysics,
 CONFIRMS that the Upper Mantle Committee remain an IUGG Committee, with representation from the International Union of Geological Sciences, and
 RESOLVES that this Committee will examine, in due course, its status, particularly with reference to the desirability of its becoming a special, or scientific committee of ICSU.

Resolution N° 7

The International Union of Geodesy and Geophysics,
 REQUESTS that national committees participating in the Upper Mantle Project consider the possibility of regional studies of features of fundamental geophysical and geological significance which transcend international boundaries, particularly the comparative inter-disciplinary study of specific geophysical areas of tectonic interest, e.g., rift zones, oceanic ridges, seismically active zones, etc., and
 RECOMMENDS that areas of special interest be subject to studies carried out on an international basis.

Resolution N° 8

The International Union of Geodesy and Geophysics,
 RESOLVES that a vote of thanks be extended to the Secretary General of the IUGG, G. Laclavere, and his assistant, A. F. Moore for their excellent work in organizing the Symposium on the Upper Mantle Project.

Resolution N° 9

The International Union of Geodesy and Geophysics,
 CONSIDERING that the provisional formulae to the refractive index given in sub paragraph (a) of Resolution N° 3 of the XII General Assembly, while applicable to unmodulated light, are liable to misinterpretation when applied in connection with modulated light,
 RESOLVES that the standard formulae to be used for calculating refractive index in electromagnetic distance measurement be as restated below:

(a) For unmodulated monochromatic light either the Edlen formula: *

$$(n-1) 10^8 = 6786.1 + \frac{3111.799}{146-\sigma^2} + \frac{26.943}{41-\sigma^2}$$

or the Barrell and Sears formula:

$$(n-1) 10^7 = 2876.04 + \frac{16.288}{\lambda^2} + \frac{0.136}{\lambda^4}$$

reduced to ambient conditions by

$$n_L = 1 + \frac{n-1}{1+\alpha t} \cdot \frac{p}{760} - \frac{0.000.000.055e}{1+\alpha t}$$

(b) For modulated light

The formula for n_L as above but substituting for n the refractive index (n_g) corresponding to the appropriate group velocity, calculated as follows:

$$n_g = n + \sigma \frac{dn}{d\sigma} = n - \lambda \frac{dn}{d\lambda}$$

(c) For radio microwaves

$$(n-1) 10^6 = \frac{103.49}{T} (p-e) + \frac{86.26}{T} \left(1 + \frac{5748}{T}\right) e$$

* This is a modified version of Edlen's formula for use in normal conditions (0°C, 760 mmHg).

Notations: n the refractive index of dry air containing 0.03% of CO₂ at normal temperature and pressure.
 n_g the effective refractive index of air for modulated light.
 n_L the effective refractive index of the light in ambient air
 σ the effective wave number of the radiation in (microns)⁻¹.
 λ the effective wave length of the radiation in microns.
 t, T temperature in degrees Celsius and degrees Kelvin.
 p atmospheric pressure in mmHg.
 α coefficient of expansion of air (0.003661).
 e partial water vapour pressure in mmHg.

Resolution N° 10

The International Union of Geodesy and Geophysics,

NOTING

(a) That the use of electromagnetic systems for distance measurement has become an essential feature of geodetic and surveying operations throughout the world and that such use is likely to be greatly extended in the future;

(b) That there are strong objections on the part of other interests in certain countries to the unrestricted use of the frequencies at present normally used by these systems;

(c) That no specific international provision has yet been made for the allocation of frequencies for electromagnetic distance measurement and that such provision as has been made nationally by individual countries is generally unsatisfactory;

(d) That systems operating on higher frequencies than those at present in use are likely to be developed in the future;

RECOGNIZING that it is essential for the satisfactory working of geodetic distance measurement systems and for the development of improved systems that suitable frequencies shall be freely available for international use;

REQUESTS

(a) that the International Council of Scientific Unions approach the International Telecommunications Union to make arrangements for the international allocation of suitable frequencies for electro-magnetic distance measurement;

(b) that such arrangements provide, as an interim measure, for the continued use with the minimum of restriction of the frequencies at present in general use,* and in the long term for the allocation of these or other suitable frequencies exclusively or primarily for distance measurement;

(c) that an adequate frequency band in the region of 36 Mc/s be allocated in the long term;

(d) that the necessity for such allocation be brought to the notice of governments of member nations.

Resolution N° 11

The International Union of Geodesy and Geophysics,

RECOGNIZING the importance of establishing an international calibration standard for gravity meters, and of a first order world gravity network,

REQUESTS adhering bodies to cooperate in all possible ways in this international program.

Resolution N° 12

The International Union of Geodesy and Geophysics,

RECOGNIZING

(a) the importance of time signals transmitted in the band from about 14 to 100 Kc/s, and

(b) the advantages of continuous time signals;

* Note: The electromagnetic systems of distance measurement at present generally available make use of the following radio frequencies:

1.2 - 1.4 Mc/s	(limited use)
2.8 - 3.2 Mc/s	(extensive use)
10.0 - 10.5 Mc/s	(extensive use)

NOTING that such signals are already available in the Americas and that they have proved useful;

RECOMMENDS to the adhering bodies that they approach the authorities in their countries to ensure that such signals be provided and extended.

Resolution N° 13

The International Union of Geodesy and Geophysics,

NOTING that the International Seismological Summary Committee has been requested to provide standards for an international seismological centre, and that the Committee appointed by the President of the Association of Seismology and Physics of the Earth's Interior has recommended that the Centre may best be established at the University of Edinburgh, and that the University of Edinburgh has expressed willingness to undertake this responsibility,

RECOGNIZES the University of Edinburgh as the seat of the new International Seismological Centre, accepts in principle the standards recommended by the ISS Committee as set out in the IUGG Monograph 14 (December 1961) and requests the cooperation of seismologists throughout the world in the establishment of this centre,

ACKNOWLEDGES the initiative of the University of Edinburgh and the support given by the U.S. National Science Foundation, and

EXPRESSES its appreciation of the devoted work of the staff of the ISS and of Dr. R. Stoneley, the retiring Honorary Director.

Resolution N° 14

The International Union of Geodesy and Geophysics,

CONSIDERING the establishment of the International Seismological Centre at the University of Edinburgh,

APPROVES the recommendation of the International Association of Seismology and Physics of the Earth's Interior that,

1. Dr. P. L. Willmore be the Director of the new international centre and of the existing International Seismological Summary under the general surveillance of the International Seismological Summary Committee.
2. That the income, resources and responsibilities of the International Seismological Summary may in due course be combined with those of the new International Seismological Centre.
3. That in the future support be extended to the new International Seismological Centre, and

RESOLVES that the new Bureau, through the IASPEI, will ensure its international character, and determine the relations with FAGS (especially the Strasbourg Centre) and WDC's.

Resolution N° 15

The International Union of Geodesy and Geophysics

RESOLVES to continue in the future the support it has given in the past to the Bulletin Mensuel du Bureau Séismologique International, Strasbourg.

Resolution N° 16

The International Union of Geodesy and Geophysics,

CONSIDERING the present status and prospects for development of the International Tsunami Warning System, and the interest of the World Meteorological Organization, the Intergovernmental Oceanographic Commission (as indicated by its resolution N° 10, 1962), and the UNESCO Intergovernmental Conference on Seismology and Earthquake Engineering (1964) in the Problems of Tsunami warning;

RECOMMENDS that

1. The existing regional warning systems operated in the Pacific Ocean by Japan, U.S.A., and U.S.S.R., and other local systems, together with the existing inter-system communication links, be regarded as the nucleus of an International Tsunami Warning System,

2. Regional warning systems subsequently set up to serve other areas of the world be recognized as components of the International Tsunami Warning System subject to satisfactory communications being established both within these systems and between them and existing systems.

3. a) A high priority be given to improving methods of communication within existing regional systems wherever possible.
b) A high priority be given to improving methods of communication between headquarters of existing systems wherever possible.
c) The best possible systems of communications be utilized, including where appropriate those functioning under the World Meteorological Organization.
d) The possibility of contributing by stations in one system to the operation of another system be recognized and implemented.

REQUESTS National Committees to endorse these resolutions and present them to their respective governments, and

RESOLVES that these resolutions be transmitted to the World Meteorological Organization, the Intergovernmental Oceanographic Commission, and the UNESCO Inter-governmental Conference on Seismology and Earthquake Engineering.

Resolution N° 17

The International Union of Geodesy and Geophysics,

NOTING the extremely uneven distribution of measurements of the heat flow from the interior of the earth and the large areas from which there are no measurements,

RECOMMENDS that measurements be made wherever the present coverage is inadequate and especially in South America, Asia, Africa north of 10°S, the Antarctic and the N.W. Pacific, and

EXPRESSES the wish that measurements be made on shields, in areas of contrasting tectonic types and in areas of abnormally high seismic absorption or electrical conductivity.

Resolution N° 18

The International Union of Geodesy and Geophysics,

CALLING attention to the fact that the World Magnetic Survey is now being coordinated by the WMS Board of IAGA,

URGES all nations to participate in WMS and contribute observations in accordance with the various technical recommendations of IAGA as set forth in IUGG Monograph N° 11, "Instruction Manual for the WMS".

Resolution N° 19

The International Union of Geodesy and Geophysics

NOTES with satisfaction the proposed Canadian-Swedish, Norwegian, Danish-Finnish-Icelandic cooperative plan for a detailed three-component aeromagnetic survey over Greenland, Iceland, the Norwegian Sea, Baltic Sea, Sweden, Norway, Denmark, Finland and Iceland with flight lines spaced 35 km apart and flown at an altitude of 3000 m, and highly endorses this planned program as an important contribution to the World Magnetic Survey.

Resolution N° 20

The International Union of Geodesy and Geophysics

RECOMMENDS that the possibility be investigated of securing observations from aeromagnetic surveys made for geophysical prospecting purposes, particularly in regions where a vector or absolute aeromagnetic survey is available as a reference, and

CONSIDERS that the detailed maps are not needed but only a sufficient number of observations useful to the WMS project, for example, observations spaced approximately 20 km apart.

Resolution N° 21

The International Union of Geodesy and Geophysics

NOTES with satisfaction the work done by a number of countries conducting aeromagnetic measurements that contribute to the World Magnetic Survey, and RECOMMENDS that efforts be made to extend greatly the coverage thus far obtained, over oceanic areas adjacent to the various countries as well as over the central portion of the oceanic basins, using, for example, longer range aircraft than currently employed.

Resolution N° 22

The International Union of Geodesy and Geophysics

RE-AFFIRMS the description given in IUGG Monograph N° 11, "Instruction Manual for the World Magnetic Survey", of the WMS data to be supplied, but wishes to stress the importance of supplying observed data, and RECOMMENDS that any derived values supplied be identified as such.

Resolution N° 23

The International Union of Geodesy and Geophysics

ENDORSES the recommendation of the CIG-IQSY Committee:
"It is recommended that one special feature of the IQSY contribution to the land and ocean survey of the WMS should be provision of magnetic survey measurements at repeat stations through their re-occupation during the IQSY or at least within the 5 year period prior to the ending of the IQSY", and

URGES

(a) the intensification of repeat stations surveys during the IQSY, in accordance with previous IAGA technical recommendations for repeat station observations, and
(b) the listing of the kinds of repeat stations and the values secured during previous re-occupations useful to the WMS.

Resolution N° 24

The International Union of Geodesy and Geophysics

RECOMMENDS that repeat station data from 1950 onwards be supplied to the World Data Centers as a contribution to the WMS,
RECOGNIZES that earlier repeat station data may be supplied in addition if they are of sufficient accuracy to permit reduction to epoch 1965 with reliability commensurate with the standards set by IAGA for the WMS, and
CONSIDERS that survey charts earlier than 1950 may be useful in the historical sequence leading to the WMS charts 1965.0.

Resolution N° 25

The International Union of Geodesy and Geophysics,

RECOGNIZES that the present time delay of one year or more in transmitting the magnetic variometer data to the World Data Centers presents serious difficulty in the rapid evaluation of the magnetic records, and

RECOMMENDS that the National Committees advise their observatories to transmit copies of magnetograms together with provisional base line and scale values to the World Data Centers as soon as possible after observation in accordance with the resolution made by the CIG-IQSY Committee.

Resolution N° 26

The International Union of Geodesy and Geophysics,

CONSIDERING the observatory, repeat station and survey data now in the World Data Centers and available to the World Magnetic Survey project,

RECOGNIZING that, in spite of the extensive program initiated during the IGY and subsequently carried forward under the auspices of SCAR, there are still significant gaps in magnetic coverage of the Antarctic continent and adjacent seas, and particularly of the southern Pacific, Atlantic and Indian Oceans,

RECOMMENDS to SCAR

- a) the desirability of urging the various national participants in the scientific program in the Antarctic to undertake in so far as possible extensive magnetic survey work in the Antarctic,
- b) the valuable contribution to the WMS that is now being made by many expeditionary vessels through the use of towed total-field magnetometers and the desirability of increasing this work by the participation of even more countries so that coverage over the southern oceans can be extended, and

RECOMMENDS further that this last point be communicated to SCOR, for referral to the Intergovernmental Oceanographic Commission with particular regard to urging all countries participating in the International Indian Ocean Expedition to add towed magnetometers to their ship programs in the Indian Ocean.

Resolution N° 27

The International Union of Geodesy and Geophysics

RECOMMENDS that measurements of the total magnetic force for the World Magnetic Survey from satellites below 1000 km altitude be conducted in such a manner that the absolute accuracy of measurement at each point is within 10 gammas without application of corrections for instrument drifts or satellite generated fields, and

RECOMMENDS particularly

- a) that magnetometers of the nuclear or atomic resonance type be used,
- b) that the latitude, longitude, and altitude coordinates of each measurement be known and specified to an accuracy of 1000 m in the horizontal plane and 250 m in the vertical direction, and
- c) that the magnetic field of the satellite be such that its contribution to the field at the magnetometer sensor be small and consistent with the absolute accuracy specified above, and

RECOMMENDS further that the date and universal time of each measurement be specified to permit removal of time variations in the final analysis of survey measurements.

Resolution N° 28

The International Union of Geodesy and Geophysics,

CONSIDERING the importance of better understanding of the distribution in time of the onset of magnetic storms at the Earth's surface, and that the IAGA has chosen a preliminary network of stations having equipment with necessary precision and time control, covering as far as possible all regions of the Earth, (8 in polar regions, 7 in middle latitudes, 4 in equatorial region) and

NOTING the need to fill the gaps still existing in this preliminary network of stations with the necessary equipment

INVITES the collaboration of Reykjavik Observatory,

RECOMMENDS the installation of a permanent station in the region of Great Whale, Canada and would appreciate the installation of quick-run equipment at Trelew, Zaria and Addis Ababa.

Resolution N° 29

The International Union of Geodesy and Geophysics,

CONSIDERING the difficulties for Sq-studies in the Southern Hemisphere,

RECOMMENDS to the National Committees, responsible for magnetic observations on islands of middle and tropical latitudes in the Atlantic, Pacific and Indian Oceans, the installation or reactivation of magnetic observatories in these regions, at least during the IQSY period.

Resolution N° 30

The International Union of Geodesy and Geophysics

NOTES with concern the breaks in the activities of the magnetic station at La Karavia (Elizabethville), which is of such a great importance in the African network of magnetic stations, and wishes that all possible effort be made in order that this observatory can resume its regular operation.

Resolution N° 31

The International Union of Geodesy and Geophysics,

CONSIDERING the research project initiated by Dr. W. Munk and his collaborators of the Institute of Geophysics and Planetary Physics of the University of California, to study the interaction between the principal tidal components and long-period meteorological phenomena,

CONVINCED of the value of this work to our understanding of changes in sea level and the potential value of the detailed analysis of very long series of tidal observations at selected stations to geophysics as a whole, and

NOTING that these data in a form compatible with electronic computing techniques will be made available to the observing authority,

COMMENDS this project to all those organizations possessing suitable data.

Resolution N° 32

The International Union of Geodesy and Geophysics;

ADOPTS the report and recommendations of the first meeting of the joint panel of experts on the equation of state of sea water (NS/9/114B of 4 December 1962, issued by UNESCO) together with the additional report of the panel prepared at its second meeting (NS/114B of 18 August 1963) clarifying the proposed redefinition of salinity and specifying additional measurements still to be undertaken.

CONSIDERS that the panel has successfully accomplished its task within its terms of reference, as outlined in the Resolution of the Hydrographical Committee of ICES, and that therefore these terms of reference should be redefined.

RECOMMENDS

1. that the "joint ICES/IAPO/SCOR/UNESCO Panel of Experts on Oceanographic Tables and Standards", be requested:

a) to carry out all the necessary preparatory work for publishing new oceanographic tables;

b) to advise on the certification of standard sea water;

c) to advise on such further investigations as may be desirable.

2. that for these new tasks the composition of the Panel be reconsidered by the sponsoring organizations; additional members might be required to advise on the nature of the tables and on the appropriate computer techniques.

3. that the International Bureau of Weights and Measures be informed of the work of the Panel, and be invited to send an observer to the next meeting.

4. that the date of the next meeting of the Panel be determined by the Director, Office of Oceanography, UNESCO, after due consultation with the members of the Panel.

5. that the UNESCO Office of Oceanography be asked to continue financial support of this important work, covering further meetings of the Panel and necessary items of measuring equipment.

6. that the Intergovernmental Oceanographic Commission should be requested to inquire among its members whether any of their institutions are in a position to contribute towards this work.

Resolution N° 33

The International Union of Geodesy and Geophysics,

NOTING that a small dome has been present within the crater of El Misti volcano, near the town of Arequipa, Peru, for at least forty years, and that it continues fumarolic

activity without increase in size, and recognizing the scientific importance of this phenomenon,

EXPRESSES the wish that the National Committee of Peru encourage detailed studies of the volcano and the adjacent area.

Resolution N° 34

The International Union of Geodesy and Geophysics,

NOTING that UNESCO plans to provide for the development of volcanological studies throughout the world and for training and research at an international center of volcanology,

EXPRESSES the hope that the International Institute of Volcanological Researches at Catania, and also all volcano observatories and volcanologists in universities, by their free exchange of information and personnel and by expansion of teaching facilities, will be able to provide UNESCO with all possible assistance, and

REQUESTS that the IUGG through IAV be regularly informed of all programs organized by the UNESCO that are related to volcanology.

Resolution N° 35

The International Union of Geodesy and Geophysics,

NOTING the importance of water to all nations of the world for their domestic, agricultural, and industrial needs is increasing rapidly, and if there is no controlled development and utilization of available water resources, serious water shortages can be expected in the very near future even in countries which are not yet industrially developed, and

NOTING that this matter has received the serious attention of UNESCO leading to its recommendation for a program of study and research on hydrology on a world-wide scale during the next decade to be designated the "International Hydrological Decade", and UNESCO has already prepared a proposed program for the Decade and asked the members of the United Nations to prepare appropriate plans and budgets to facilitate a program of international cooperation in hydrology; and

CONSIDERING that the main function of UNESCO in the Decade will be that of organization and training, and that it is imperative that proper scientific guidance be made available to insure that the program accomplishes its basic goals, namely the expansion of data, education, and research in hydrology; therefore,

RECOMMENDS strongly that UNESCO should call upon IUGG to serve as the scientific advisor for the preparation and the implementation of the Decade program;

RESOLVES that appropriate committees of IUGG be established as required to meet the needs for scientific guidance and studies for the IHD, and recognizes that the International Association of Scientific Hydrology should play a pre-eminent role in the scientific aspects of the Decade;

CONSIDERING on the other hand that hydrology is an interdisciplinary science which requires the application of a wide variety of scientific talents to the study of hydrologic problems; and

RECOGNIZING, therefore, that each Union and Association in the ICSU family should have a voice commensurate with its interests and capabilities with respect to the international programme in scientific hydrology;

REQUESTS ICSU to seek the participation of other unions interested in this project.

Resolution N° 36

The International Union of Geodesy and Geophysics,

RECOMMENDS that FAGS consider the formation of a permanent service on the fluctuation of glaciers, and

INSTRUCTS the Secretary of IASH to provide the necessary information to FAGS on the operation of the service and the estimated financial requirements.

Resolution N° 37

The International Union of Geodesy and Geophysics,

EXTENDS its most sincere thanks for the arrangements made to hold the XIII General Assembly in Berkeley to the National Academy of Sciences of the United States, the General Arrangements Committee of the American Geophysical Union, the Regents of the University of California and to the Local Arrangements Committee.

Resolution N° 38

The International Union of Geodesy and Geophysics,

RECOGNIZING the important contributions made by UNESCO in initiating and furthering many international geophysical research projects,

PLACES ON RECORD its deep appreciation of the support given by UNESCO, particularly the Department of Natural Sciences under the direction of Professor Kovda.

Resolution N° 39

The International Union of Geodesy and Geophysics,

RECOGNIZING the important role of the IUGG Chronicle and the IUGG Monographs, PLACES ON RECORD its grateful thanks to Ing. Gen. G. Laclavere, the retiring IUGG Secretary-General, for initiating and publishing these series, and for his efforts to secure their wide distribution.

Resolution N° 40

The International Union of Geodesy and Geophysics,

RECOGNIZING the great and invaluable contributions made by Ing. Gen. G. Laclavere, IUGG Secretary-General 1951-1963, during which period the IUGG has become a strong and important organization,

PLACES ON RECORD its deep appreciation and gratitude for all his services

INTERNATIONAL ASSOCIATION OF GEODESY

Resolution N° 41

See IUGG Resolution N° 9

Resolution N° 42

See IUGG Resolution N° 10

Resolution N° 43

The International Association of Geodesy,

NOTING the great and increased use of electromagnetic methods for geodetic distance measurement and the confusion that often results from the variety of different terms that are used in this connection:

CONSIDERS that there is a need for uniform terminology, and

RESOLVES that the terminology set out in the report of the Special Study Group N° 19 for 1960-1963 be adopted as standard

Resolution N° 44

The International Association of Geodesy

CONSIDERING 1) that the determination of refractive index now constitutes a most difficult problem and serious source of error in electromagnetic distance measurement;