

ORIGIN AND DEVELOPMENT OF THE AMERICAN
GEOPHYSICAL UNION, 1919-1952

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Abstract--The American Geophysical Union has to do with those theoretical and applied sciences relating to the Earth, its configuration, its structure, and the natural forces acting upon and within it. Since the founding of the Union in 1919, it has gradually developed so that in 1952, with nearly 5000 members, it is perhaps the principal organization in the United States of America acting as a clearing house for new scientific thoughts and ideas relating to Geophysics.

Sponsored by the National Research Council of the National Academy of Sciences, the Executive Committee of the Union is the Committee on Geophysics of the Council and the National Committee for the United States of America of the International Union of Geodesy and Geophysics.

The wide-spread special interests of the eight Sections of the Union are expressed in papers presented at the annual meetings, in the regional meetings (often held in co-operation with other scientific organizations), and in the Union's Transactions, which were formerly published annually and published bimonthly since 1945. Symposia on timely subjects are annual features of the General Assemblies.

The fields of the Sections of the Union are: (a) Geodesy; (b) Seismology; (c) Meteorology; (d) Terrestrial Magnetism and Electricity; (e) Oceanography; (f) Volcanology; (g) Hydrology; and (h) Tectonophysics.

The American Geophysical Union has made every endeavor in the past 33 years to increase coordination and collaboration of interests, both nationally and internationally, and to maintain continuity of the functions of the International Union of Geodesy and Geophysics, thus protecting for future international activities those relations so essential to geophysical investigations, especially during World War II. A prominent Geophysicist of California has said: "The Union, in my opinion, is to be congratulated for having the vision and courage to proceed (during the War) with the annual meetings. The Nation needs more, not less, scientific endeavor."

In these chaotic days following World War II, as never before, responsibility for continued attainment of geophysical knowledge falls with particular emphasis upon the Geophysicists of the Western Hemisphere. Now, as never before, American scientists personally benefit by affiliation with their fellow scientists and co-workers, since the individual worker is under a great handicap. Now, as never before, scientists in general of the Western Hemisphere need to affiliate and play their part not only in the immediate problems of application, in which the Geophysicist is contributing effectively, but in the rehabilitation of international relations and endeavors particularly vital to investigations of the Earth sciences.

This article must be limited to a general account of the origin and development of the Union during the 33 years from 1919 to June, 1952. As a matter of record, detailed particulars of the Union's history are given in the Appendices on subjects as indicated in the Table of Contents.

Early organization--Soon after the establishment of the National Research Council in 1916, Chairman Hale of the Council asked for a memorandum respecting provision to be made for certain geophysical sciences through the concept of the American Geophysical Union even prior to the formation of the International Research Council (designated International Council of Scientific Unions since 1932) and its Union of Geodesy and Geophysics.

In a memorandum prepared by Louis A. Bauer is the statement: "It would appear that great opportunities are before us to make our influence felt in the world of science by which are meant those subjects of research which embrace the Earth or even the universe within their legitimate provinces." In subsequent correspondence with Hale, the term "Geophysics" was defined to include Geodesy, Geological Physics, Meteorology, Terrestrial Magnetism and Electricity, Seismology, and Tides and Oceanography. It was recommended that there be formed a special committee of the Council or a subcommittee of Geophysics dealing especially with world physical sciences. Stimulation was given to the project as early as 1916 at a joint meeting of the American Physical Society and the Section of Physics for the American Association for the Advancement of Science in a paper by Bauer entitled *Our Part in the Advancement of World Physical Sciences*. Following the establishment in 1918 of the International Research Council, when World War I was drawing to a close, there was tentatively established by the National Research Council an American Section of the proposed International Geophysical Union, one of the bodies contemplated by

the International Research Council. In all the early documents, the purpose seems to have been to provide a meeting ground for men having points of contact and common interest in geophysical research. This already had been accomplished in Great Britain by July, 1917, when a special Committee on Geophysics was appointed by the British Association for the Advancement of Science. The British Committee on Geophysics held its first meeting in London during November, 1917; that Committee has had geophysical meetings quite frequently ever since.

In December, 1918, Chairman Hale of the National Research Council appointed a small committee to consider the question of the organization of an American Section of the proposed International Geophysical Union and named R. S. Woodward as Chairman. Woodward's report of March 4, 1919, addressed to the Chairman of the National Research Council, is quoted as a major stone in the eventual foundation of the American Geophysical Union:

Your Committee appointed to consider the question of a logical and practicable organization of the proposed American Section of the International Geophysical Union respectfully submits the following report:

The Earth is at once the subject and the object of many sciences. Of these the most important are Astronomy, Geodesy, Geology, Meteorology, Seismology, Terrestrial Magnetism, Terrestrial Electricity, Tides, and Volcanology.

While each of these sciences is more or less distinct in itself, they are closely related to one another, and progress in any one of them may be expected to depend to a great extent on the general progress attained in the others. Each of these sciences has its devotees and its experts, and the number of these in the aggregate is now very large. Hence in any scheme of effective organization it is essential to secure groupings of these various subdivisions of Geophysics in order that the number of groups may not be too unwieldy in the transaction of business essential to such organizations. But it should be distinctly understood that in recommending a limited number of groups for purposes of administration it is not desired to discourage relations of closest reciprocity between the devotees to the various sciences included in the groups. On the contrary, it is the opinion of your Committee that progress in the future is most likely to result from active cultivation of the borderlands that now serve to distinguish, but only indefinitely, the several fields of Geophysics.

It should be understood also that the groupings recommended are to be regarded as provisional and subject to such changes as future experience may suggest. It is recognized also that the groupings here recommended may not be the most appropriate for all countries or possibly for an international organization, since much regard should be given in all such matters to historical precedents and to the circumstances presented at any epoch by individual investigators, and especially by governmental organizations, of any country.

With these reservations the Committee recommends that the following groups of subjects should be recognized in the organization of the American Section of the International Geophysical Union:

Group 1: Geodesy--This group may be assumed to deal with questions concerning the size, the shape, and the mechanical properties of the Earth.

Group 2: Seismology and Volcanology.

Group 3: Meteorology and Mareology, including especially all questions presented by the mechanical properties of the atmosphere and the oceans.

Group 4: Terrestrial Magnetism and Terrestrial Electricity--This group is intended to deal with the magnetic and electric properties of the Earth, including its atmosphere.

The Committee recommends that initially the designation of members to constitute the proposed Geophysical Section be made by the National Academy of Sciences. It is further recommended that in making such designations regard be had to the desirability of securing representatives from the following Government Bureaus: Bureau of Fisheries; Bureau of Mines; Bureau of Standards; Coast and Geodetic Survey; Hydrographic Office, U. S. Navy; Geological Survey; Weather Bureau.

Similarly, the Committee suggests that representatives also may be fitly chosen from the following national societies: American Astronomical Society; American Mathematical Society; American Physical Society; Geological Society of America; Seismological Society of America.

The Committee further recommends that, in order to promote research and discovery in geophysical science in general, steps be taken by the American Section of the International Geophysical Union toward the formation of a new society to be called the American Geophysical Society.

The Executive Committee of the Division of Physical Sciences of the Council approved the organization and initial membership of the American Section on Geophysics on March 10, 1919 (see Appendix A). This action was soon thereafter approved by the National Academy of Sciences. On

April 15, 1919, the Executive Board of the Council named a Provisional Executive Committee of the American Section of the International Geophysical Union. The first meeting of this Committee was held in Washington, D. C., May 20, 1919. Members present were William Bowie, Cross, Leuschner, Marvin, Peters (representing Bauer), Reid, Woodward, and, by invitation, Wood.

A. O. Leuschner quoted the following recommendations from the minutes of the joint meeting of the Executive Board and the Council of the National Academy of Sciences: The formation of an American Section of the proposed International Geophysical Union was tentatively approved with the provision that the subjects to be included and their grouping be determined by the Section after its permanent organization, reference to the Section of the question of the formation of an American Geophysical Society, and nomination on behalf of the Executive Committee of the Division of Physical Sciences for membership in the Section. These were adopted.

William Bowie, Moulton, and Marvin were appointed a Committee on Variation of Latitude of the American Section of the International Geophysical Union, to confer with a similar Committee of the American Section of the International Astronomical Union and to make joint recommendations with that Committee as regard future organization of researchers on the variation of latitude.

Bauer, William Bowie, Cross, Reid, Marvin, and Leuschner, with Woodward as Chairman, were appointed to prepare recommendations regarding international cooperation in geophysical subjects for consideration by the American Section of the International Geophysical Union, with the understanding that this Committee had power to increase its membership.

Following the appointment of William Bowie as Acting Chairman of the American Section of the International Geophysical Union, an organization meeting of the Section was designated to be held in Washington in conjunction with the meeting during June, 1919, of the American Section of the International Astronomical Union, and H. O. Wood was made a member of the American Section and designated as its Secretary.

Committees of one were appointed to prepare brief statements in regard to the past history, present status, and scientific purposes of: (1) International Geodetic Association; (2) International Seismological Association; (3a) International Meteorological Committee; (3b) International Committee for the Study of Free Atmosphere; and (4) International Commission of Terrestrial Magnetism.

Those appointed were Bowie for (1); Reid for (2); Marvin for (3a) and (3b); and Peters for (4). Instructions were also given that the Chairman of the small Committee prepare a brief general statement in regard to the past history, present status, and scientific purposes of Geophysics in general.

For the information of this Committee, the British proposals for the Convention of an International Union of Geophysics under the International Research Council were read and Leuschner was requested to prepare a clarifying statement in regard to foreign proposals.

This led to a discussion of the appropriate place of Volcanology and other subjects in the organic scheme of the International Union of Geodesy and Geophysics. To illustrate the difference of opinion as regards classification, a letter from C. E. Mendenhall of the Office of the Scientific Attaché Research Information Service at the American Embassy in London, conveyed the attitude of the Royal Society of Great Britain as to its attitude on the subject of Volcanology:

The Royal Society feels that all branches of volcanology, except those using seismological methods and observations, are essentially geological in character and are largely in the hands of geologists at present. In this opinion I imagine that Dr. Cross would agree with them, but their way of handling the situation is exactly opposite to that of Dr. Cross. They feel that the geophysical organization is already so complex and involves so many connections with other subjects that it would be better in this case not to attempt to embody the whole subject of volcanology under geophysics and to establish the liaison with geology, which would be necessary in that case, but rather to establish the subject definitely under geology and then let the geologists establish the necessary liaison with the Seismological Section of the Geophysical Union. This, of course, represents only the recommendation of the Royal Society, and it does not follow that it will necessarily be adopted at the Brussels Meeting.

As a result of the discussion, various members of the Committee were requested to prepare statements regarding the subdivisions of geophysical science in their international aspects for

consideration at its second meeting, which was held March 11, 1920. At the second meeting of this Committee reports were heard from the Committees on Statutes and By-Laws and on the First Annual Meeting to be held on April 23, 1920. A preliminary meeting of the tentative American Section of the proposed American Geophysical Union was held in Washington on June 24-25, 1919. At that time, the Council of the Academy was not prepared to recognize the need of a special body for Geophysics alone, and considered that the desired object could be attained by merging Geophysics with Geography. But, soon after this action, a more distinctive recognition was granted Geophysics in that it was mentioned specifically in the title of one of the more important divisions of the organization of the National Research Council, namely, the Division of Physics, Mathematics, Astronomy, and Geophysics.

At the close of World War I and the reorganization of the National Research Council on a peace basis, the question arose as to how best to secure representative membership for the various Divisions of the Council, Physical Sciences, Chemistry, Geology, and others. For those sciences which had national societies, the solution was relatively easy as representatives could be recruited through the Division of Physical Sciences from recommendations made to the National Research Council by the American Physical Society, the American Astronomical Society, the American Mathematical Society, and so on. Representatives for the geophysical sciences, however, could not be so easily chosen because the only society then interested in Geophysics was the Seismological Society of America, and there were no distinct national societies for Geodesy, Terrestrial Magnetism and Atmospheric Electricity, Volcanology, Oceanography, and Geophysical Chemistry. It was not until later that the American Meteorological Society was organized.

The second meeting of the Provisional Executive Committee in June, 1919, was followed by a preliminary meeting in Washington, D. C., of the tentatively organized American Section of the proposed International Geophysical Union on June 24-25, 1919.

William Bowie acted as Chairman at this meeting and it was agreed that permanent organization be deferred until after the first international meeting was held in Brussels. The proposal that the Geophysical Committee be a part of the Division of Physical Sciences and concern itself with national, as well as international, problems in Geophysics was agreed to. Delegates were appointed to the Brussels Meeting and resolutions were adopted respecting various matters of interest to the organization and Section of the proposed International Union. The delegates (William Bowie, Bauer, and Marvin) were also named a committee to draft a plan for the permanent organization of the American Section after the Brussels Meeting during July 18-28, 1919.

On November 13, 1919, the Secretary of the tentative American Section transmitted to the members, Proposals for the Permanent Organization and Statutes of the American Geophysical Union. These were prepared by a subcommittee, after giving careful consideration to: (1) the structure and Statutes of the International Research Council, and the International Union of Geodesy and Geophysics, definitely formed at Brussels in July, 1919; (2) the present relations of the existing American Section of the proposed International Geophysical Union to the National Research Council, and the relations considered desirable in future; and (3) views expressed by present members especially at an informal conference of the Committee of the Brussels geophysical delegates with members of the American Section who reside in or near Washington, D. C. This conference was held on October 31, 1919, at the National Research Council; there the subcommittee had the benefit of extended discussion with Chairman Mendenhall of the Council's Division of Physical Sciences, and with Washington, both of whom were present at Brussels. Secretary Wood further stated in his transmitting letter:

The present status of the American Section is that of a Committee of the Division of Physical Sciences of the National Research Council. This status it will retain until it is discharged as such, or until it is superseded by the adoption, at some definite date, of proposals for permanent organization which change its status. In this connection it has seemed best to the Committee on Organization to recommend that the proposed American Geophysical Union be made a Committee of the Council as a whole, and that the Union be so constituted as to unite and coordinate in our country the interests of physics, chemistry, and geology in geophysical questions.

The name American Geophysical Union was settled upon as the result of careful consideration and evolution of various preliminary drafts. Thus, instead of Union it was originally proposed to use the term Committee, and later Commission; however, as progress was made in drawing up the proposals, the need of a more appropriate term became evident. Thus, the American Geophysical Union, as proposed, is a union of two distinct committees, namely, the American National Committee of the International Geodetic and Geophysical Union, and the Committee on Geophysics of the National Research Council. In the absence of

an American Geophysical Society in the United States, the proposed Union would seek to bring together and coordinate all societies, bodies, and institutions in the United States interested in geophysics.

The proposals were unanimously approved by the Executive Board of the National Research Council on December 20, 1919. On February 20, 1920, the American Geophysical Union was made a Committee of the Executive Board of the Council, and its first meeting, as a Union, was held on April 23, 1920.

The records for the earlier years are fragmentary and the materials for the section on Early Organization (p. 5 and following) have been, of necessity, largely taken from Louis A. Bauer's The Organization and Aims of the American Geophysical Union, presented at the Annual Meeting, April, 1923 [Bull. Nat. Res. Council, no. 41, pp. 7-18, 1924; see also H. O. Wood, Science, v. 50, pp. 233-238 and 255-259, 1919].

History and functions--Thus the American Geophysical Union (AGU) was created in 1919 as an Executive Committee by the National Research Council of the National Academy of Sciences (NRC NAS) to function as the American National Committee of the International Union of Geodesy and Geophysics (IUGG) and the Committee on Geophysics of the NRC. Its defined duties are "to promote the study of problems concerned with the figure and physics of the Earth, to initiate and coordinate researches which depend upon international and national cooperation, and to provide for their scientific discussion and publication." Presently these duties are organized under eight Sections of the Union, namely: Geodesy, Seismology, Meteorology, Terrestrial Magnetism and Electricity, Oceanography, Volcanology, Hydrology, and Tectonophysics. These fields are briefly described in Appendix D. The Statutes and By-Laws, as amended to July 31, 1950 (no subsequent changes), are shown in Appendix B.

The original limit in number was 65. This limit held until April, 1922, when it was set at 75. Late in 1928 it was revised to 100, and in April, 1930, the limit was removed by action of NRC. From 1919 to 1931 funds required for the expenses of the Union were provided by NRC. Because of the rapid growth and extension of interests, it was arranged that from 1932 annual contributions (\$2 through 1936, \$3 during 1937 to 1945, \$5 during 1946 to 1949, and \$7 since 1950) be made by each person associated with AGU. The annual aid from NRC was reduced to \$400. Nearly 5000 qualified persons are now collaborating as annual contributors; about one-half of these were enrolled during 1944 to 1950 [see Appendix I]. Printed alphabetical lists of members and officers are published about every two years.

A list of the officers of the Union and its Sections from the founding up to 1952 is presented in Appendix C.

An important milestone in the history was passed in 1939 when Richard M. Field, then President of AGU, brought to successful culmination the establishment of the William Bowie Medal, the award of which has been described by impartial observers as "about the highest honor a man in (this) field can receive." More details regarding the establishment and award of this Medal are given in Appendix E.

National responsibilities--The AGU serves national interests in its specified duties in co-ordinated fact finding and applications of the dynamics of Earth sciences in part through (1) annual meetings (33 were held in Washington through 1952) for presentation and discussion of scientific papers and progress reports in the eight branches of Geophysics and their interrelations and interpretations, and (2) regional meetings (27 since 1934; see subsequent section entitled Regional meetings) for similar agenda. These annual and regional meetings, appraised by competent authorities to be most stimulating and profitable, afford unique opportunities for contact and discussion among leading investigators and for the promotion and development of knowledge and applications in the related fields. In the earlier years communications were received annually not only from the United States but also from Canada, Mexico, Central America, and some of the South American countries. The rapidly increasing knowledge in all fields of Geophysics, for example, from the determination of dynamics of soil erosion, cosmic relations of radio wave propagation, to forecasting water resources from snow surveys within the past few years, has enlarged the responsibilities of the Union in national progress.

International responsibilities--The AGU serves international interests in studies of natural Earth forces that condition human endeavor and progress in making use of the Earth's resources, of land, of minerals, and of water, and must have world-wide coordination of effort, that is, co-operation which is unrestricted by national boundaries. The Union has taken prominent part,

through designation of delegates by NRC and NAS upon the Union's recommendation to the triennial assemblies of the IUGG. (So far nine assemblies, usually triennial, have been held, namely: Rome in 1922, Madrid in 1923, Prague in 1927, Stockholm in 1930, Lisbon in 1933, Edinburgh in 1936, Washington in 1939, Oslo in 1948, and Brussels in 1951.) These meetings have coordinated and stimulated international plans and efforts. During the War the AGU was an important factor in maintaining continuity of international activities, which otherwise would have lapsed. It thus insured normal and effective postwar rehabilitation of the IUGG. In particular, the AGU has taken part in enlarging the interest and participation of the other countries of the Western Hemisphere in Geophysics.

Publications--The AGU serves science by advancing knowledge and facilitating applications of dynamics to Earth forces and materials. This is done through the publication of scientific papers, discussions, and reports at the annual and regional meetings in the Union's Transactions (for list, corrected through January, 1954, see Appendix J). Up to 1944 these included 22 annual volumes with 31 separate parts. Since August, 1945, the Transactions have been published bi-monthly. Through the method of offset printing directly from prepared copy, the all-inclusive cost of publication has been remarkably low. Some 17,767 pages have been published since 1920 (equivalent to about 25,000 pages in the usual conventional printed format) in editions of 2000 and over at a rate per page much less than the cost for ordinary letter-press printing. Volumes 1 to 25 (1920-1944) total 11,053 pages, and Volumes 26 to 33 (through Part 3) of the bimonthly series of the Transactions total 6714 pages. The number of each issue printed by the offset method is now 5600. The Transactions are distributed to those enrolled in the Union, to reviewing journals, and by subscription and gift to nearly 1000 geophysicists and interested organizations and libraries abroad. Other publications (see Appendices J and K) include five volumes and 49 exhibit maps concerned with the Washington Assembly of IUGG in 1939, a series of annual bibliographies of American hydrologic literature from 1935-1940, and an index to the Transactions from 1920-1944. Until 1944 the editing and preparation of master copy for publication was done gratuitously in the spare time of officers of the Union, particularly its General Secretary. Since August, 1945, the Transactions have been published bimonthly (each issue containing 150 pages or more), and the editing has been done by the members of the Editorial and Publication Committee.

Opportunity--The opportunity for enlarged service to our national and international contributions in Earth sciences is almost boundless. The following are typical examples of the Union's usefulness in obtaining international and national cooperation.

(1) The AGU sponsored and organized two naval expeditions to the Caribbean. These would hardly have been attempted by private organizations. They represented a cost equivalent to hundreds of thousands of dollars in the use of surface and subsurface vessels and scientific personnel and equipment made available, largely upon the Union's solicitation, by governmental and research organizations (United States Navy, Department of State, American Telephone and Telegraph Co., Princeton University, Carnegie Institution of Washington, Woods Hole Oceanographic Institution, the Dutch Government, and others). The results of this are shown by the Bathymetric Chart of the Caribbean Sea of the Hydrographic Office [H. O. Miscell. 9062, 26 1/2 by 50 inches; a limited supply of these maps is available through the American Geophysical Union and copies will be inserted in reprints of this paper], the title of which is reproduced here as Figure 1. The opportunity for enlarged service of the Union to national and international contributions to the scientific aspects of the Earth sciences seems almost boundless. This expedition is an outstanding example.

BATHYMETRIC CHART OF THE CARIBBEAN SEA

To Accompany Report of Navy-Geophysical
Union Gravity Expedition, 1936-1937,
by H. H. Hess

Compiled at the U. S. Hydrographic Office, mainly
from sounding data obtained by U. S. Navy Vessels

Fig. 1--Title of Bathymetric Chart of the Caribbean Sea

(2) Just before the outbreak of World War II the Union, in collaboration with the National Geographic Society and the University of Virginia, had obtained authority for the use, during one year, of a United States Coast Guard 300-foot cutter with complete complement of men, and had secured scientific personnel and equipment from various research organizations for extensive geophysical and biological surveys in the area of the South Pacific Islands, all without expense to AGU, and with the gratuitous services of scientific investigators, an unique example of use of facilities requiring coordination and cooperation. The large practical and scientific additions to knowledge that would have resulted, had not the War interfered just when arrangements had been made and equipment in large measure assembled on the West Coast, can hardly be estimated.

(3) The AGU has not only stimulated organization of major expeditions, as in (1) and (2), for the securing of needed data, but was also active in fostering coordinated analyses, and the diffusion of new information thus obtained. This was partly brought about through the Union's cooperation in sponsorship and presentation of joint symposia; examples are (a) The Geophysical Exploration of the Ocean Bottom, with the American Philosophical Society, and (b) The Surface and Sub-surface Exploration of Continental Borders, with Sections D (Astronomy) and E (Geology and Geography) of the American Association for the Advancement of Science.

It is this type of catalytic functioning in many fields which the AGU can bring about with comparatively little actual expenditure of its own funds and without burden upon scientific endowments.

Effect of the War--The War greatly increased the demands upon the resources of the Union by reason of (1) increased costs, (2) increased number of associates in the armed forces and the consequent increased burden upon those available to continue essential and expanding operations, not only because of applications to the war effort but also the rapidly enlarging potential applications in postwar progress, and (3) increased need of maintenance to safeguard continuation of international progress and cooperative effort.

Postwar and present needs--The continued and future success of the AGU depends upon (1) publication of Transactions, (2) moderate financial aid besides that contributed by its present 5000 associates to overcome the handicap caused by the abnormal conditions induced by the War, and (3) a paid full-time Executive Secretary and staff. To meet these pressing needs the AGU planned, in 1943, to establish a financial basis consonant with the opportunities to advance geophysical knowledge and applications in both international and national undertakings. To this end additional special voluntary contributions from associates were solicited in a total of \$10,000 toward the estimated goal of \$30,000 required for the three years from July 1, 1944, to June 30, 1947; the additional \$20,000 required to realize this total was generously granted by the Rockefeller Foundation in 1944. By 1947, and with the return of normal conditions, the number of persons associated with AGU had so increased that the annual contributions became sufficient to meet fully the expenses of maintenance and future development.

In the mid 1940's, the contribution of voluntary services had become such a heavy burden under existing conditions with the increasing responsibilities of the Union that it could not equal the need. Continued and enlarged functioning, in keeping with the growing opportunity, was provided by the appointment of a full-time paid Executive Secretary and staff of three beginning in September, 1944.

Thus, for the purpose of serving more effectively the sciences dealing with the Earth itself and of ultimately applying such knowledge more efficiently to the advancement of human interests, the AGU has now (1952) placed its operations on an independent footing, and now that the Union is functioning as it should, it is in a position to meet its many opportunities and responsibilities for national and international progress.

Annual General Assemblies--As stated above, the objects of the Union are to promote the study of problems concerned with the figure and physics of the Earth, to initiate and coordinate researches which depend upon international and national cooperation, and to provide for their scientific discussion and publication. To this end, the Union is divided into the eight Sections cited earlier, following the general plan of organization of the International Union of Geodesy and Geophysics. A Section of Geophysical Chemistry was discontinued May 31, 1924, as the International Union had failed to provide such a Section. The Section of Hydrology was established November 15, 1930; matters pertaining to scientific hydrology referred to the AGU were previously looked after by Special Committees on Hydrology. The Section of Tectonophysics (a Section not included in the IUGG) was established April 9, 1940, for the purpose of promoting and encouraging research of fundamental importance to our knowledge of Earth structure not covered in any one of the other Sections of the Union.

General Assemblies of the Union and meetings of its Sections for presentation and discussion of papers and symposia are held in Washington, D. C., each year. A brief account of these is presented in Appendix F. The first Annual Meeting or Assembly of the Union was that of 1920.

One of the unusual features of the Union is, of course, the possibility it offers for personal contacts, nationally and internationally, among geophysicists everywhere. In the early years, when membership was small, dinners were frequently arranged at the time of annual meetings; in later years, beginning in the 1930's, smokers, with light refreshments, have been arranged and have proved very valuable in providing social contact, and opportunity for meeting colleagues on a purely informal basis. Appendix G provides an example of the earlier phase of this Union activity.

Regional meetings--Following the formation of the Section of Hydrology, regional meetings were held usually jointly with other organizations having coordinated interests. For the purpose of such meetings, the Executive Committee of the Section of Hydrology originally designated selected regional areas, namely: North Continental Divide -- Montana, Idaho, eastern Washington, eastern Oregon, and Alberta (affiliated); South Continental Divide -- Colorado, Wyoming, Utah, and New Mexico; North Pacific Coast -- western Washington, western Oregon, Alaska, and British Columbia (affiliated); South Pacific Coast -- California, Nevada, Arizona, and Hawaii. Besides the regional meetings sponsored by the Section of Hydrology, the Union has also encouraged joint meetings with organizations and societies interested in the discussion of various aspects of the geophysical sciences.

Thus far, regional meetings have been held as follows (references to publication of proceedings given refer to the Transactions of the Union, part and year):

- (1) South Pacific Coast Area at Berkeley, California, jointly with Western Interstate Snow Survey Conference, June 20-21, 1934 [pt. 2, 1934, pp. 522-633].
- (2) South Pacific Coast Area at Pasadena, California, jointly with Western Interstate Snow Survey Conference, January 31-February 1, 1936 [pt. 2, 1936, pp. 455-562].
- (3) South Continental Divide Area at Denver, Colorado, jointly with South Continental Divide Snow Survey Conference and with the Society of American Foresters, June 21-26, 1937 [pt. 2, 1937, pp. 509-663, with addendum in pt. 2, 1938, pp. 668-669, and Journal of Forestry, v. 35, pp. 991-1055 1937].
- (4) North Continental Divide Area at Spokane, Washington, December 28-29, 1937 [pt. 2, 1938, pp. 590-594].
- (5) South Pacific Coast Area at Davis, California, jointly with Western Interstate Snow Survey Conference, January 7-8, 1938 [pt. 2, 1938, pp. 595-667 and 672-743].
- (6) South Pacific Coast Area at Los Angeles, California, jointly with the Western Interstate Snow Survey Conference, December 16-17, 1938 [pt. 1, 1939, pp. 3-96].
- (7) Symposium on The Surface and Subsurface Exploration of Continental Borders, at Richmond, Virginia, jointly with Sections D and E of the American Association for the Advancement of Science, December 27, 1938 [pt. 3, 1940, pp. 781-826].
- (8) North Continental Divide Area at Spokane, Washington, jointly with the Western Interstate Snow Survey Conference, December 28, 1938 [pt. 1, 1939, pp. 97-138].
- (9) South Pacific Coast Area at Stanford University, California, jointly with the Western Interstate Snow Survey Conference, January 12-13, 1940 [pt. 1, 1940, pp. 3-143].
- (10) Symposium on Applications of Mathematics in the Earth Sciences, and Hydrologic Problems in the Ohio and Michigan Basins, at Columbus, Ohio, jointly with Sections A and E of the American Association for the Advancement of Science, the American Mathematical Society, the Mathematical Association of America, and the Geological Society of America, December 29, 1939 [pt. 4, 1940, pp. 1065-1146].
- (11) North Pacific Coast and North Continental Divide Areas at Seattle, Washington, jointly with the Western Interstate Snow Survey Conference and Section E of the American Association for the Advancement of Science, June 19-22, 1940 [pt. 3, 1940, pp. 831-1061].
- (12) South Pacific Coast Area at Sacramento, California, jointly with the Western Interstate Snow Survey Conference, January 16-18, 1941 [pt. 1, 1941, pp. 5-216].
- (13) Symposium on Relation of Geology to the Ground-Water Problems of the Southwest, at Dallas, Texas, jointly with the American Association for the Advancement of Science, December 30, 1941 [pt. 1, 1942, pp. 3-56].
- (14) South Pacific Coast Area at Pasadena, California, jointly with the Western Interstate Snow Survey Conference, January 16-17, 1942 [pt. 1, 1942, pp. 57-171].
- (15) North Pacific Coast Area at Corvallis, Oregon, jointly with the Western Snow Conference, June 16, 1943 [pt. 3, 1943, pp. 1-99, and Addendum on pp. A1-A3].
- (16) South Pacific Coast Area at Berkeley, California, jointly with the Western Snow Conference and Pacific Coast Section of the American Society of Agricultural Engineers, February 17-18, 1944 [pt. 1, 1944, pp. 3-185].

(17) South Pacific Area at Los Angeles, California, February 27, 1945. (The Transactions were published bimonthly beginning in August, 1945, and from that date onward papers have no longer been printed as a unit, related to a particular meeting, but individually.)

(18) South Pacific Area at Sacramento, California, jointly with the Pacific Coast Section of the American Society of Agricultural Engineers and the Western Snow Conference, February 26-28, 1946.

(19) South Pacific Area at Pasadena, California, February 15, 1947.

(20) North Pacific Area at Portland, Oregon, jointly with the Western Snow Conference and the Columbia Basin Water Forecast Committee, April 21-23, 1947.

(21) New England Meeting at Middletown, Connecticut, at Woods Hole, Massachusetts, and at Cambridge, Massachusetts, September 17-19, 1947 (meeting at Cambridge jointly with the American Meteorological Society).

(22) South Pacific Coast Area, Sections of Hydrology, Oceanography, and Meteorology, at Berkeley, California, February 13-14, 1948.

(23) South Pacific Coast Area, Sections of Hydrology and Meteorology, at Los Angeles, California, February 4-5, 1949.

(24) South Continental Divide Area at Denver, Colorado, jointly with the Western Snow Conference, April 26-28, 1949.

(25) South Pacific Coast Area, Sections of Meteorology and Hydrology, at Davis, California, February 3-4, 1950.

(26) South Pacific Coast Area, Sections of Meteorology and Hydrology, at Fresno, California, February 9-10, 1951.

(27) Pacific Southwest Region, Sections of Meteorology and Hydrology, at Pasadena, California, February 8-9, 1952.

Following World War II, there was considerable sentiment for the increase of regional activity, extending it, possibly, to all Sections. Merrill Bernard was appointed chairman of a special committee to study the problem, and after an extensive survey a report was adopted [see Trans., v. 30, pp. 936-939, December, 1949] establishing a very flexible plan of regionalization. The Pacific Southwest Region is the only one formally organized under the plan [for By-Laws, see Trans., v. 33, pp. 629-630, August, 1952], but sentiment for regional activity is growing in other regions, and others will no doubt be organized in due course.

Student subscriptions--In 1948, a special committee (Chairman W. C. Jacobs and Florence Robertson) was established to study the problem of a possible student membership. The Committee did not find among universities and other institutions of higher learning any significant student population that could be conveniently and significantly brought into a student group or chapter form of membership. Though the report [Trans., v. 31, pp. 648-649, August, 1950] was generally favorable to the establishment of such a membership, questions were raised if the likely number of such memberships would justify the necessary changes in the Statutes and By-Laws. It was subsequently decided [Trans., v. 32, p. 146, February, 1951] that, as a trial, a student subscription be established at a rate to be set by the General Secretary that would defray costs. (The rate of \$4 was subsequently established.) Since that action, the number of student subscriptions has been about 20 per year; this small number justifies the judgment of the Executive Committee. It is a natural consequence of the fact that files of the Transactions are found in practically every library of universities offering courses in any aspect of the broad field of Geophysics.

Miscellaneous--Since 1925, the Union has had, without charge, office quarters and storage space with the Carnegie Institution of Washington first at its Department of Terrestrial Magnetism (5241 Broad Branch Road, Northwest, Washington 15, D. C.) until 1947, and then at the Administration Building of the Institution (1530 P Street, Northwest, Washington 5, D. C.). This has taken an important part in the economical operation of the Union, one certainly equivalent to an annual gift of not less than \$2000. Grateful acknowledgments of this have been made by resolutions unanimously adopted at each Annual Meeting.

Review of Appendix H on finances of the Union from 1932 to June, 1952, shows how generously the Rockefeller Foundation of New York and the Geological Society of America have aided the progress of the Union by substantial grants-in-aid.

The relation of the Union to, and the sponsorship by, the National Research Council of the National Academy of Sciences and the continued annual grants of the Council have also greatly aided the Union in its attainment of the recognition of Geophysics as a profession. That progress has been more definitely indicated by the establishment, within the Academy, of a formal Section of Geophysics on July 1, 1951, presently (June, 1952) numbering 20 members, following the elections to membership in the Academy of eminent geophysicists of the United States as sponsored by the Temporary Nominating Committee on Geophysics of the Academy during the preceding nine years.

**APPENDIX A--MEMBERSHIP OF PROVISIONAL COMMITTEE OF AMERICAN SECTION,
PROPOSED INTERNATIONAL GEOPHYSICAL UNION, APRIL, 1919, TO APRIL 23,
1920, AND OF MEMBERSHIP OF AMERICAN GEOPHYSICAL UNION
FOR FIRST TEN ANNUAL MEETINGS, 1920-1929**

Membership^a of "American Section of the proposed International Geophysical Union" as of July 1, 1919, and members elected before first Annual Meeting of AGU, April 23, 1920

C. G. Abbot	H. C. Graves (4) [1919]	A. A. Michelson (4) [1931]
S. J. Barnett (5) ^b	G. E. Hale [1938]	R. A. Millikan (3) [1953]
Joseph Barrel (1) [1919] ^c	J. F. Hayford (1) [1925]	F. R. Moulton (4) [1952]
L. A. Bauer (5) [1932]	D. L. Hazard [1951]	G. P. Paine [1929]
H. B. Bigelow (4)	A. J. Henry [1931]	F. A. Perret [1943]
W. R. Blair (3) [1949]	L. M. Hoskins [1937]	W. J. Peters [1942]
E. H. Bowie (3) [1943]	W. J. Humphreys (3) [1949]	H. F. Reid (2) [1944]
William Bowie (1) [1940]	T. A. Jaggar [1953]	F. Schlesinger (1) [1943]
J. C. Branner (2) [1922]	A. O. Leuschner (1) [1953]	R. B. Sosman (2)
L. J. Briggs	G. W. Littlehales (4) [1943]	W. F. G. Swann (5) (resigned 1953)
E. W. Brown (1) [1938]	C. F. Marvin (3) [1943]	C. E. Van Orstrand (resigned 1952)
Whitman Cross (2) [1949]	Max Mason (dropped 1921)	R. DeC. Ward [1931]
R. A. Daly (2)	S. J. Mauchly [1928]	J. T. Watkins (4) (resigned 1926)
W. M. Davis [1934]	A. G. Mayor (4) [1922]	H. O. Wood (2)
A. L. Day (2)	A. G. McAdie (3) [1943]	R. S. Woodward (1) [1924]
R. F. Faris (5) [1932]	G. F. McEwen (4)	J. B. Woodworth [1925]

Elected after First Annual Meeting, April 23, 1920,
through Tenth Annual Meeting, April 25-26, 1929^d

L. H. Adams	J. W. Greig	R. C. Murphy (resigned 1950)
O. S. Adams	Harvey C. Hayes (dropped 1934)	Frank Neumann
E. T. Allen	N. H. Heck [1953]	William E. Parker [1942]
John A. Anderson (resigned 1953)	C. A. Heiland	G. T. Rude (resigned 1946)
J. P. Ault [1929]	C. V. Hodgson [1929]	Waldo L. Schmitt
L. W. Austin [1932]	E. O. Hulburt	E. S. Shepherd [1949]
H. G. Avers [1947]	C. O'D. Iselin	Edward H. Smith
W. D. Bancroft (resigned 1933)	Lewis V. Judson	George Steiger [1944]
D. C. Barton [1939]	H. H. Kimball [1944]	C. H. Swick
N. L. Bowen	W. D. Lambert	F. A. Tondorf [1929]
Austin H. Clark	Esper S. Larsen, Jr.	S. D. Townley [1946]
F. W. Clarke [1931]	A. C. Lawson [1952]	M. A. Tuve
H. H. Clayton [1946]	J. B. Macelwane	T. Wayland Vaughan [1952]
J. H. Dellinger	H. A. Marmer [1953]	G. R. Wait [1953]
C. N. Fenner [1949]	H. E. McComb [1952]	H. S. Washington [1934]
Charles J. Fish	W. C. Mendenhall (resigned 1934)	Roger C. Wells [1944]
J. A. Fleming	H. E. Merwin	Frank Wenner
Oliver H. Gish	H. F. Moore [1939]	Bailey Willis [1949]
W. R. Gregg [1938]	George W. Morey	Fred E. Wright [1953]
		E. G. Zies

^aEx-officio members not listed were the Chairmen of the five Divisions of the National Research Council: Chemistry (W. D. Bancroft in 1919, who was elected to AGU in May, 1920, after expiration of appointment as Chairman in 1919-20); Biology and Agriculture (C. E. McClung in 1919-20 [1946]); Geography and Geology (E. B. Mathews in 1919-20 [1944]); Physics (C. E. Mendenhall in 1919-20 [1935]); Foreign Relations (G. E. Hale in 1919 [1938], who was elected to AGU in March, 1920, after expiration of appointment as Chairman).

^bThe figure in parentheses following name indicates geophysical field in tentative American Section of the proposed International Geophysical Union, namely: (1) Geodesy; (2) Seismology; (3) Meteorology; (4) Physical Oceanography; (5) Terrestrial Magnetism.

^cIndication in brackets following name is the year of death of the individual.

^dTotal net membership excluding five ex-officio members, namely, Chairmen of Divisions of National Research Council, as of April 26, 1929, was 95.

APPENDIX B
NATIONAL RESEARCH COUNCIL
AMERICAN GEOPHYSICAL UNION

STATUTES AND BY-LAWS

(Originally adopted at organization in 1919 and as amended to July 31, 1950)

PREAMBLE

The American Geophysical Union is hereby established by the National Research Council. It supersedes the "American Section of the proposed International Geophysical Union." The American Geophysical Union is the American National Committee of the International Union of Geodesy and Geophysics and the Executive Committee of the American Geophysical Union is the Committee on Geophysics of the National Research Council.

STATUTES

Article 1: Objects--(a) To assist in carrying out the objects of the International Union of Geodesy and Geophysics, which are: To promote the study of problems concerned with the figure and physics of the Earth; to initiate and coordinate researches which depend upon international cooperation, and to provide for their scientific discussion and publication; and to facilitate special researches.

(b) To promote, coordinate, and facilitate the study of the various branches and interrelationships of geodesy and geophysics in the United States of America, its outlying territories, and the ocean; to provide for scientific discussion, publication, and dissemination of information relative to these fields through the Transactions of the American Geophysical Union and other means.

Article 2: Bequests, Grants, Contributions, and Funds--The Union, upon approval of the National Research Council, may receive bequests, grants, contributions, and funds and may make disbursements therefrom, upon approval of the National Research Council.

Article 3: Membership--The membership of the American Geophysical Union shall be as follows:

(a) Members--(1) Those who composed the membership of the "American Section of the proposed International Geophysical Union" on July 1, 1919.

(2) Citizens of the United States of America engaged in geophysical research or its applications, elected by the Executive Committee of the American Geophysical Union.

(3) Nationals of other countries having the same qualifications, elected by the Executive Committee of the Union; these may not vote or be officers of the Union or of its Sections, or delegates of the Union to International Assemblies or Meetings.

Members in good standing for a total of 15 years shall, following retirement from active professional service because of age and upon advice to the General Secretary, be extended the complete privileges of members without further payment of dues.

(b) Members ex officio--(1) The Chairmen of the following Divisions of the National Research Council: Foreign Relations; Physical Sciences; Chemistry and Chemical Technology; Geology and Geography; and Biology and Agriculture.

(2) Officers of the International Union of Geodesy and Geophysics and of its Associations, who are citizens of the United States of America.

(c) Corresponding Members--Nationals of other countries, outstanding in the field of geophysics, elected by the Executive Committee of the American Geophysical Union; they shall not

pay dues but shall enjoy the privileges of Members except that they may not vote or be officers of the Union or of its Sections or delegates of the Union at International Assemblies or Meetings.

(d) Associates--Citizens of the United States of America other than those eligible for regular membership under Article 3, Sections (a) or (b), whose interest in Geophysics is deemed by the Executive Committee of the Union to warrant their election. Associates shall enjoy the privileges of Members except that they may not be officers of the Union or of the Sections, or be delegates of the Union at International Assemblies or Meetings.

(e) Corporation Members--Corporations and other organizations interested in geophysics, elected by the Executive Committee of the Union. The designated representative of each such organization shall enjoy the privileges of a Member.

Article 4: Sections--The American Geophysical Union shall consist of Sections as follows: (a) Geodesy; (b) Seismology; (c) Meteorology; (d) Terrestrial Magnetism and Electricity; (e) Oceanography; (f) Volcanology; (g) Hydrology; and (h) Tectonophysics.

Members, Corresponding Members, Associates, and Corporation Members shall designate the Section, or Sections, with which they desire to be affiliated. The function of the Sections, in their respective fields, shall be the promotion of the objects of the American Geophysical Union.

Article 5: Officers of the American Geophysical Union--The officers of the American Geophysical Union shall consist of a President, a Vice-President, and a General Secretary, whose terms of office shall expire June 30, 1947, but terms of office effective July 1, 1947, shall be for periods of three years, with the limitation that the President and Vice-President shall not be eligible for immediate reelection; in case any office becomes vacant, the Executive Committee of the Union shall designate a successor in office to complete the term. These officers shall be elected by mail ballot.

There may also be elected, by mail ballot, an Honorary President whose nomination shall be tentatively approved at a meeting of the Executive Committee, followed by a mail ballot of the entire Executive Committee. A confirming vote of three-fourths of those voting shall be required to place the name on the ballot. This office shall be filled only as a special honor for outstanding service to the Union. It shall be for life without payment of dues.

The General Secretary shall act also as Treasurer and shall receive and disburse all dues, grants, and funds otherwise received as authorized by the Executive Committee of the Union; his accounts shall be audited annually by a Committee on Audit.

The Executive Committee of the Union may employ an Executive Secretary, who shall be directly responsible to the General Secretary.

Article 6: Officers of Sections--The officers of each Section of the American Geophysical Union shall consist of a President, a Vice President, and a Secretary, whose eligibility and periods of office shall correspond to those of the Union as indicated under Article 5. These officers shall be elected by mail ballot. In case any office becomes vacant the Executive Committee of the Section concerned shall designate a successor in office to complete the term. The President of each Section shall have the power to appoint, with the right to vote, a representative of the Section to such meetings of the Executive Committee of the Union as he may be unable to attend.

Article 7: Executive Committees--The Executive Committee of the Union shall consist of the President, the Vice President, and the General Secretary of the Union, and of the President or his designated representative and Secretary of each Section of the Union, the last past Presidents of the Union and of the Sections, Chairmen of the Standing Committees of the Union; and, in addition, ex officio, the Honorary President, the Executive Secretary of the Union, those officers of the International Union of Geodesy and Geophysics and of its Associations who are citizens of the United States of America, and the Chairman of each of the following Divisions of the National Research Council: Foreign Relations; Physical Sciences; Chemistry and Chemical Technology; Geology and Geography; and Biology and Agriculture.

This Committee shall have charge of all administrative matters of the American Geophysical Union, and shall be the representative of the Union in its relations with the National Research Council and with the International Union of Geodesy and Geophysics. The Executive Committee of the Union, in consultation with the Sections, shall nominate to the Executive Board of the National Research Council delegates, or representatives, to the Assemblies and Meetings of the International Union of Geodesy and Geophysics and of its Associations, in accordance with the regulations fixed by the International Research Council for the voting power of the United States of America.

There shall be an Executive Committee of each of the Sections of the Union which shall include at least the President, Vice-President, and the Secretary and the last past President of the Section.

Article 8: Annual Meetings--The American Geophysical Union and its Sections shall meet annually at such time and place as may be chosen by the Executive Committee of the Union.

Article 9: Special Meetings--Special meetings of the American Geophysical Union, of any Section or of any group of Sections, and of any Local or Regional Branch may be called by the respective Presidents with the advice of the respective Executive Committees; notification of such meetings must be communicated promptly to the office of the General Secretary of the Union.

Article 10: Branches of the Union--Local or Regional Branches of the Union may be established on the approval of the Executive Committee of the Union. These Branches shall be organized along the general lines of the Union, shall be responsible to the Executive Committee of the Union, and shall duly report their activities through the General Secretary.

Article 11: Publications--The official publication of the Union shall be the Transactions of the American Geophysical Union published under the auspices of the National Research Council of the National Academy of Sciences. Control of matter to be published in the Transactions shall rest in an Editorial and Publication Committee composed of at least one Member from each Section, designated by the Executive Committee of the Section which he represents and appointed by the President of the Union. The General Secretary of the Union shall be ex-officio Chairman and the Executive Secretary of the Union shall be ex-officio Secretary. The Editorial and Publication Committee shall have responsibility (a) of acceptance, editorial revision and condensation, or rejection of any material submitted for publication in the Transactions and (b) as regards any special publications subject to the approval of the Executive Committee of the Union.

Non-members of the Union may subscribe to the Transactions, and purchase individual copies thereof, as well as other publications of the Union at rates approved by the Executive Committee of the Union.

Article 12: By-Laws--The American Geophysical Union is authorized to enact such By-Laws as may be necessary for the performance of its functions and duties.

Article 13: Amendments--(a) Any Member, Associate, or Corporation Member may propose an amendment to the Statutes or By-Laws, which after consideration by the Committee on Statutes and By-Laws and upon approval by the Executive Committee of the Union, shall be submitted for vote to the membership of the Union.

(b) After 30 days' notice has been given, amendments to the Statutes or By-Laws shall be voted on by mail. They require for adoption a majority vote of the membership voting.

(c) Amendments to the Statutes of the American Geophysical Union shall be subject to the approval of the National Research Council.

BY-LAWS

(1) The fiscal year of the American Geophysical Union shall conform to the fiscal year of the National Research Council.

(2) Members of the Union, in classes (a) and (d) of Article 3 of the Statutes, shall pay dues not to exceed \$7 for each calendar year, the amount for each year to be fixed by the Executive Committee of the Union; Members of class (e) shall pay dues of \$100 for each calendar year; any Member or Associate, on payment of \$100 at any time, shall be relieved of further payment of dues.

(3) Standing Committees shall be as follows: Statutes and By-Laws; Membership; Meetings; Nominations; Budget; Audit; and Editorial and Publication.

(4) Special Committees shall be established from time to time, as need arises, to consider special matters approved by the Executive Committee of the Union.

(5) Appointments to Committees of the American Geophysical Union shall be made by the President or President-Elect and appointments shall terminate at the end of the fiscal year for which they are made, unless otherwise specifically designated; no appointment shall extend, however, beyond the term of office of the appointing President or President-Elect.

(6) Meetings of the Union shall be called at least 30 days in advance, and those present at the meeting shall constitute a quorum.

(7) Meetings of the Executive Committee of the Union shall be called by the President at least 15 days in advance and a minimum of 12 shall constitute a quorum.

(8) Final action on matters affecting any Section specifically shall not be taken by the Executive Committee of the Union when that Section is not represented.

(9) Statutes and By-Laws adopted by a Section or Branch shall not conflict with the provisions of the Statutes and By-Laws of the Union.

(10) Matters pertaining solely to a Section and not to the Union as a whole, shall be acted upon by the Section concerned.

(11) No mail ballot of the Union shall be closed until at least 30 days after date of issue.

(12) Officers, designated by the Executive Committee of the Union or the Executive Committee of any of its Sections, to fill uncompleted terms, shall not hold office without election after expiration of the period for which their predecessors were elected.

(13) Removal from the rolls, other than by resignation, of a Member, Corresponding Member, Associate, or Corporation Member of the American Geophysical Union shall be made only upon a three-fourths vote of a quorum of the Executive Committee of the Union; Members, Associates, and Corporation Members who fail to pay dues for two consecutive years shall be reported to the Executive Committee by the General Secretary with recommendation that their names be removed from the Union's rolls.

(14) Under special circumstances and upon request to the General Secretary any Member or Associate may be transferred to an Inactive List of the Union without further payment of dues and without other privileges as Member or Associate but reinstatement may be made upon request and payment of current year's dues.

Reelection of Members and Associates who have been dropped from the rolls by action of the Executive Committee of the Union may be effected only after filing a signed application under the usual procedure for election of Members and Associates.

(15) The Executive Committee of the Union may arrange, either through bequests, special contributions, grants, or other funds of the Union, for awards, medals, honoraria, or certificates of merit to geophysicists in recognition of meritorious work or service in the field of the whole Union or in the field of any of its several Sections, and for scholarships, fellowships, or grants-in-aid to assist worthy candidates in the advancement of geophysical science.

(16) The Executive Committee may appoint Union or Section representatives to other organizations, upon mutual agreement, when such representation may promote coordination and interest in

geophysics. The Executive Committee of the Section concerned shall make tentative arrangements for interorganization-relationships and make selections of representatives of the Sections. Arrangements and commitments must be ratified by the Executive Committee of the Union before they are binding on the Union.

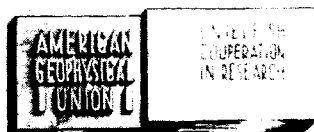
(17) The duties of the President shall be those ordinarily appertaining to this office; he shall preside at the meetings of the Executive Committee and at General Meetings of the Union, shall appoint members of Standing and Special Committees; in the absence or disability of the President, the Vice-President shall carry out the duties ordinarily performed by the President. The more important letters, and especially those concerned with policy of the Union, shall be signed by the President or the General Secretary in accordance with rules, precedents, and decisions of the Executive Committee of the Union.

(18) The General Secretary elected by the Union shall be responsible to the Executive Committee of the Union for the general administration of the Union's activities as determined by the Executive Committee of the Union. He shall exercise general supervision over the Executive Secretary, serve without honorarium, receive and disburse funds for the Union in accordance with the instructions of the Executive Committee of the Union, and provide a surety bond, in a sum set by the Executive Committee of the Union and at the expense of the Union, for funds of the Union in his control. He shall sign checks as General Secretary on the account of the American Geophysical Union with a depository approved by the Executive Committee of the Union; in his absence the President, or, in his absence, the Vice-President, of the Union shall sign checks against the account.

(19) The Executive Secretary shall be responsible to the General Secretary and, with the assistance of such clerical help as is necessary, shall perform all executive and other duties as indicated by the General Secretary.

(20) One copy of each issue of (a) the Transactions, (b) any published List of Members and Officers, and (c) any other publication which may be approved for free distribution to the membership by the Executive Committee of the Union, shall be sent to each Member, Associate, and Corporation Member whose annual dues for the calendar year have been paid by July 1; any person or organization newly elected as Member, Associate, or Corporation Member shall be sent without charge one copy of each of these publications beginning with the calendar year in which elected and for which dues have been paid. Each member on a retired basis, Member ex officio, and Corresponding Member shall be accorded this privilege also.

Each person and organization in good standing in any class of membership may purchase any available publication of the Union at one-third discount from printed price-list to non-members. The General Secretary is authorized to establish discounts for sales of publications in quantity.



**APPENDIX C--OFFICERS OF AMERICAN GEOPHYSICAL UNION
SINCE ORGANIZATION IN 1919**

(The officers of the Union and of its individual Sections until April 28, 1938, were designated as Chairman, Vice Chairman, and General Secretary (for the whole Union) and Secretary (for Sections); thereafter the designations have been President, Vice President, General Secretary, and Secretary.)

Section	President	Vice President	Secretary
General officers of the Union			
Union	W. Bowie ^a (1920-1922)	L. A. Bauer ^a (1920-1922)	H. O. Wood (1919-1921)
	L. A. Bauer ^a (1922-1924)	A. L. Day (1922-1924)	W. J. Humphreys ^a (1921-1922)
	H. F. Reid ^a (1924-1926)	H. S. Washington ^a (1924-1926)	W. Bowie ^a (1922-1925)
	H. S. Washington ^a (1926-1929)	G. W. Littlehales ^a (1926-1929)	J. A. Fleming (1925-1947)
	W. Bowie ^a (1929-1932)	L. H. Adams (1929-1932)	K. H. Beij (1947-1953)
	W. J. Humphreys ^a (1932-1935)	A. H. Clark (1932-1935)	[Waldo E. Smith Executive Secre- tary since Sep- tember, 1944]
	N. H. Heck ^a (1935-1938)	R. M. Field (1935-1938)	
	R. M. Field (1938-1941)	W. C. Lowdermilk (1938-1941)	
	W. C. Lowdermilk (1941-1944)	L. H. Adams (1941-1944)	
	L. H. Adams (1944-1947)	W. H. Bucher (1944-1947)	
	O. E. Meinzer ^a (1947-1948)	H. U. Sverdrup ^b (1947-1948)	
	W. H. Bucher (1948-1953)	F. W. Reichelderfer (1948-1953)	
Officers of the Sections			
(a) Geodesy	W. Bowie ^a (1920-1922)	J. F. Hayford ^a (1920-1922)	H. O. Wood (1920-1922)
	J. F. Hayford ^a (1922-1924)	R. L. Faris ^a (1922-1924)	W. Bowie ^a (1922-1925)
	R. L. Faris ^a (1924-1926)	J. F. Hayford ^a (1924-1925)	W. D. Lambert (1925-1931)
	W. Bowie ^a (1926-1929)	W. Bowie ^a (1925-1926)	C. H. Swick (1931-1937)
	W. D. Lambert (1929-1932)	F. E. Wright ^a (1926-1929)	W. D. Sutcliffe (1937-1943)
	H. G. Avers (1932-1935)	L. J. Briggs (1929-1932)	J. A. Duerksen (1943-1947)
	C. L. Garner (1935-1938)	D. C. Barton ^a (1932-1935)	F. L. Culley (1947-1953)
	C. H. Swick (1938-1941)	P. H. Underwood (1935-1938)	
	R. M. Wilson (1941-1944)	R. M. Wilson (1938-1941)	
	W. D. Sutcliffe (1944-1947)	C. R. Longwell (1941-1944)	
	H. W. Hemple (1947-1950)	P. Kissam (1944-1947)	
	H. H. Hess (1950-1953)	H. H. Hess (1947-1950)	
		A. J. Hoskinson (1950-1953)	

(Continued)

APPENDIX C--Continued

Section	President	Vice President	Secretary
Officers of the Sections -- Continued			
(b) Seismology	H. F. Reid ^a (1920-1922) W. J. Humphreys ^a (1922-1924) J. B. Woodworth ^a (1924-1926) L. H. Adams (1926-1929) N. H. Heck ^a (1929-1932) F. Wenner (1932-1935) F. W. Lee (1935-1938) J. B. Macelwane (1938-1941) H. E. McComb ^a (1941-1944) V. C. Stechschulte (1944-1947) F. Neumann (1947-1950) P. Byerly (1950-1953)	J. C. Branner ^a (1920-1922) J. B. Woodworth ^a (1922-1924) L. H. Adams (1924-1926) N. H. Heck ^a (1926-1929) F. Wenner (1929-1932) F. W. Lee (1932-1935) J. B. Macelwane (1935-1938) H. E. McComb ^a (1938-1941) V. C. Stechschulte (1941-1944) F. Neumann (1944-1947) P. Byerly (1947-1950) L. M. Murphy (1950-1953)	H. O. Wood (1920-1922) D. L. Hazard ^a (1922-1928) F. Neumann (1928-1931) H. E. McComb ^a (1930-1936) F. Neumann (1936-1941) A. Blake (1941-1945) L. M. Murphy (1945-1947) Florence Robertson (1947-1950) J. T. Wilson (1950-1953)
(c) Meteorology	C. F. Marvin ^a (1920-1922) E. H. Bowie ^a (1922-1924) C. G. Abbot (1924-1926) H. H. Kimball ^a (1926-1929) G. W. Littlehales ^a (1929-1932) W. R. Gregg ^a (1932-1935) C. F. Brooks (1935-1938) R. H. Weightman (1938-1941) C. W. Thornthwaite (1941-1944) F. W. Reichelderfer (1944-1947) H. R. Byers (1947-1950) B. Holzman (1950-1953)	W. J. Humphreys ^a (1920-1922) R. DeC. Ward ^a (1922-1924) H. H. Kimball ^a (1924-1926) G. W. Littlehales ^a (1926-1929) W. R. Gregg ^a (1929-1932) C. F. Brooks (1932-1935) R. H. Weightman (1935-1938) C. W. Thornthwaite (1938-1941) C.-G. Rossby (1941-1944) H. R. Byers (1944-1947) B. Holzman (1947-1950) H. C. Willett (1950-1953)	A. J. Henry ^a (1920-1929) O. H. Gish (1929-1935) H. D. Harradon ^a (1935-1947) W. C. Jacobs (1947-1953)
(d) Terrestrial Magnetism and Electricity	L. A. Bauer ^a (1920-1922) W. F. G. Swann (1922-1924) L. A. Bauer ^a (1924-1926) N. H. Heck ^a (1926-1929)	W. F. G. Swann (1920-1922) L. A. Bauer ^a (1922-1924) N. H. Heck ^a (1924-1926) J. H. Dellinger (1926-1929)	J. A. Fleming (1920-1929) H. W. Fisk ^a (1929-1932) E. O. Hulburt (1932-1938)

(Continued)

APPENDIX C--Continued

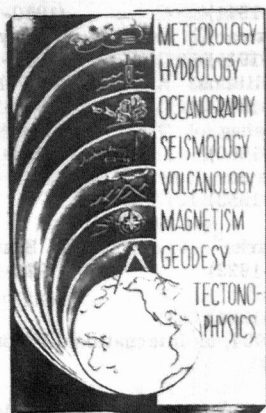
Section	President	Vice President	Secretary
Officers of the Sections -- Continued			
(d) Terrestrial Magnetism and Electricity (concluded)	D. L. Hazard ^a (1929-1932) J. A. Fleming (1932-1935) O. H. Gish (1935-1938) E. O. Hulburt (1938-1941) E. A. Eckhardt (1941-1944) H. F. Johnston (1944-1947) Irwin Roman (1947-1950) J. W. Joyce (1950-1953)	L. W. Austin ^a (1929-1932) S. B. Nicholson (1932-1935) T. H. Johnson (1935-1938) E. A. Eckhardt (1938-1941) H. F. Johnston (1941-1944) Irwin Roman (1944-1947) J. W. Joyce (1947-1950) V. Vacquier (1950-1953)	J. W. Joyce (1938-1944) D. G. Knapp (1944-1950) L. R. Alldredge (1950-1953)
(e) Oceanography	G. W. Littlehales ^a (1920-1922) J. P. Ault ^a (1922-1924) N. H. Heck ^a (1924-1926) T. W. Vaughan ^a (1926-1928) R. L. Faris ^a (1928-1929) (Messrs. Faris and Peters elected at Ninth Annual Meeting to complete terms of officers who resigned because of expected absences from United States during 1929.) A. H. Clark (1929-1932) H. A. Marmer ^a (1932-1935) T. G. Thompson (1935-1938) C. O. Iselin (1938-1941) P. C. Whitney (1941-1944) H. U. Sverdrup (1944-1947) G. F. McEwen (1947-1950) A. C. Redfield (1950-1953)	A. G. Mayor ^a (1920-1922) G. W. Littlehales ^a (1922-1924) W. J. Peters ^a (1924-1926) G. T. Rude (1926-1928) W. J. Peters ^a (1928-1929) H. B. Bigelow (1929-1932) T. G. Thompson (1932-1935) C. O. Iselin (1935-1938) G. F. McEwen (1938-1941) H. U. Sverdrup (1941-1944) Waldo L. Schmitt (1944-1947) Edw. H. Smith (1947-1950) R. R. Revelle (1950-1953)	J. T. Watkins (1920) W. E. Parker (1920-1923) G. T. Rude (1923-1926) A. H. Clark (1926-1929) H. A. Marmer ^a (1929-1932) C. O. Iselin (1932-1935) P. C. Whitney (1935-1941) Waldo L. Schmitt (1941-1944) L. P. Disney (1944-1947) R. H. Fleming (1947-1953)
(f) Volcanology	H. S. Washington ^a (1920-1922) L. H. Adams (1922-1924) T. A. Jaggar, Jr. ^a (1924-1929) A. L. Day (1929-1932) C. N. Fenner (1932-1935)	R. A. Daly (1920-1922) T. A. Jaggar, Jr. ^a (1922-1924) N. L. Bowen (1924-1926) F. E. Wright ^a (1926-1929) R. A. Daly (1929-1932)	H. O. Wood (1920-1921) R. B. Sosman (1921-1928) C. N. Fenner (1928-1932) A. H. Koschmann (1932-1935) (Continued)

APPENDIX C--Concluded

Section	President	Vice President	Secretary
Officers of the Sections -- Concluded			
(f) Volcanology (concluded)	E. T. Allen (1935-1938) E. G. Zies (1938-1941) A. F. Buddington (1941-1944) R. E. Fuller (1944-1947) W. S. Burbank (1947-1950) E. S. Larsen, Jr. (1950-1953)	E. S. Larsen (1932-1935) W. S. Burbank (1935-1938) A. Knopf (1938-1941) J. F. Schairer (1941-1944) Howel Williams (1944-1947) W. F. Foshag (1947-1950) T. P. Thayer (1950-1953)	E. Callaghan (1935-1938) J. Gilluly (1938-1940) E. Ingerson (1940-1941) J. S. Vhay (1941-1944) F. G. Wells (1944-1950) F. Chayes (1950-1953)
(x) Geophysical Chemistry	A. L. Day (1920-1922) H. S. Washington ^a (1922-1924) (Section was discontinued May 31, 1924, as International Union failed to provide for such a Section.)	F. W. Clarke ^a (1920-1922) W. Cross ^a (1922-1924)	R. B. Sosman (1920-1924)
(g) Hydrology (Section organized November 15, 1930)	O. E. Meinzer ^a (1930-1933) C. S. Scofield (1933-1936) L. K. Sherman (1936-1939) N. C. Grover (1939-1942) J. E. Church (1942-1947) L. G. Straub (1947-1950) F. J. Veihmeyer (1950-1953)	R. E. Horton ^a (1930-1933) C. H. Lee (1933-1936) J. E. Church (1936-1939) M. P. O'Brien (1939-1942) L. G. Straub (1942-1947) F. J. Veihmeyer (1947-1950) M. Bernard ^a (1950-1951) W. B. Langbein (1951-1953)	H. N. Eaton (1930-1933) K. H. Beij (1933-1947) Ray K. Linsley, Jr. (1947-1953)
(h) Tectonophysics (Section organized April 9, 1940)	L. H. Adams (1940-1943) E. Cloos (1943-1947) M. K. Hubbert (1947-1950) Robert Balk (1950-1953)	R. A. Daly (1940-1943) L. L. Nettleton (1943-1947) Robert Balk (1947-1950) Francis Birch (1950-1953)	D. T. Griggs (1940-1943) M. K. Hubbert (1943-1947) W. S. Burbank (1947-1953)

^aDeceased. ^bResigned as Vice President, having moved permanently to Norway.

APPENDIX D--DESCRIPTIVE PAMPHLET OF THE AMERICAN GEOPHYSICAL UNION AND OF THE SECTIONS OF THE UNION (AS OF 1952)



THE AMERICAN GEOPHYSICAL UNION

The American Geophysical Union (AGU) was established in 1919 by the National Research Council as the United States Committee of the International Union of Geodesy and Geophysics (IUGG). In this regard it is unique among scientific organizations.

In addition to this international relationship, it is a group of scientists and scientific workers in the broad field of the Earth Sciences. Most of the members are in the United States, with some scattered over the world. The Executive Committee of the Union serves also as the Committee on Geophysics of the National Research Council of the National Academy of Sciences. In this three-fold capacity AGU is in excellent position to keep its membership abreast of developments in Geophysics abroad as well as at home.

The objectives of AGU are to promote the study of problems concerned with the figure and physics of the Earth, to initiate and coordinate researches which depend upon national and international cooperation, and to provide for their scientific discussion and publication.

Papers relating to developments in the broad field of Geophysics and its branches are presented and discussed at the annual meetings and regional meetings which are often held in cooperation with other scientific organizations. These and other papers, submitted directly, are published in the bimonthly *Transactions* which comprise 900 to 1000 pages annually. *Transactions* also include reviews, bibliographic material, and items of general geophysical interest.

In these critical years greater emphasis than ever before is being placed on science and its relationship to international good will. The IUGG has resumed its functions effectively, as evinced by the Eighth General Assembly held at Oslo, Norway, in 1948, and the Ninth at Brussels, Belgium, in August 1951, and is assuming an important role in relation to the International Council of Scientific Unions, United Nations Educational, Scientific, and Cultural Organization, and scientific activity in general.

Workers in any of the branches or fields of interest outlined below, and those such as engineers, geologists, ecologists, and agriculturalists who have a major interest in any of them, may become members of the AGU, take part in its activities, and receive its publications. To become a member, one should consult a member, or write to the American Geophysical Union, 1330 P Street, N.W., Washington 5, D. C., to secure an application form. Dues for individual members are \$7.00 per year, including a subscription to the *Transactions*. Corporation membership dues are \$100 per year. A member may affiliate with as many Sections as he desires without further payment.

THE SECTIONS OF THE UNION

(a) Geodesy

This Section of the Union is devoted to surveying of large areas on the Earth's surface, dealing particularly with triangulation, leveling, and gravimetric surveys. Its objectives are principally determining the shape and size of the Earth and adequate mapping of the Earth's surface. Borderline subjects are photogrammetry and cartography. The fields of interest are:

Shape and size of Earth	Gravimetric surveys and prospecting
Triangulation	Earth tides
Precise leveling	Variation of latitude
Mapping	Deflections of the vertical

(b) Seismology

The Section is of interest to the geophysicist, the geophysical prospector, the foundation engineer, the structural engineer, the geologist, the astronomer, and the insurance executive. The fields of interest are:

Problems of earthquakes	Internal constitution of the Earth
Transmission of vibratory waves through the Earth	Surface structure of the Earth
	Seismic exploration

(f) Volcanology

The Section of Volcanology encourages research not only in "pure" volcanology but also in many fields such as the study of volcanic and intrusive rocks, relation of ore deposits to igneous activity, and laboratory experiments on processes of volcanism and the formation of igneous rocks and ore deposits. Among the fields of interest are:

Origin of igneous rocks	Petrography
Geochemistry and radioactivity	Experimental petrology
Volcanic activity and products	Ore-forming fluids and solubility of elements in them
Mechanics of intrusion	

(g) Hydrology

The Section of Hydrology deals with the distribution, behavior, and disposition of precipitation on the land areas of the Earth, and as such is a borderline science of interest to agronomists, engineers, foresters, meteorologists, soils technicians, geologists, and others. It thus forms a meeting ground for all those who are concerned with any phase of hydrology. Since the inception of the Section in 1931, its membership has contributed much to theories of precipitation, runoff, infiltration and percolation, movement of flood waves, soil erosion and the transportation and deposition of sediment, density currents, the behavior of ground water, evapotranspiration, glaciers, the physics of soil moisture, and the development of useful techniques for dealing with hydrologic problems. The fields of interest are:

Precipitation	Dynamics of streams
Runoff	Transportation and deposition of sediment
Infiltration and percolation	Hydraulics of natural channels
Evaporation and transpiration	Lakes
Chemistry of natural waters	Glaciers
Ground water	Snow and ice, snow surveying
Soil moisture	Permafrost

(h) Tectonophysics

The Section of Tectonophysics coordinates the application of physical methods and geologic and geophysical data to the solution of problems of Earth structure, through laboratory experiments, geological observations, and theoretical analyses. The fields of interest are:

In the laboratory	In the field
Physical constants of rocks and minerals	Metamorphic processes
Deformation of minerals, including ice	Nature and behavior of the crust
Deformation of rocks	World-wide tectonic patterns
Structural Petrology	Mechanics of glacier flow
	Forces available for crustal deformation

(c) Meteorology

Meteorology is the scientific study of the physical processes which occur in the atmosphere and of the connected processes of the lithosphere and hydrosphere. It seeks to provide an understanding of the causes of weather and climatic conditions and their changes. These exert a profound influence on the entire course of existence of everything on the Earth's surface and in its gaseous envelope of utmost interest and the recent developments in artificial weather control. Meteorology is therefore related and of universal interest to all branches of pure and applied science, technology, agriculture, business, communications and transport, and military and naval strategy and tactics. The fields of interest are:

Practical meteorology
Methods, data, forecast, and other applications

Physical properties, composition, and general structure of the atmosphere

Structure, mechanics, and thermodynamics of the atmosphere in general; radiation and temperature; atmospheric pressure, wind, water vapor and hydrometeors, fog, clouds, and precipitation; soil moisture and hydrology; hydrometeorology

Climatology
Solar climate, climatic zones, influence of latitude; variations of climate; micro-climatology; types of climate, bioclimatology; climatology of the free atmosphere; influence of environment

Various phenomena and influences
Cosmic influences; visibility through the atmosphere; optical, electrical, and acoustical phenomena in the atmosphere

(d) Terrestrial Magnetism and Electricity

The field of this Section is the study of the magnetic and electric phenomena of the Earth's interior and atmosphere. The field has experienced new impetus during recent years because of developments in radio communication in which the magnetic and electric properties of the outer atmosphere play a vital role. Cosmic radiation likewise comes into this field. The intimate connection between the electrical and magnetic conditions of the Earth and various solar phenomena has caused many astrophysicists and solar physicists to affiliate with the Section. The fields of interest are:

Magnetic and electric phenomena and properties of the Earth and the atmosphere

Permanent geomagnetic fields; variable fields, internal and external

Natural electric earth currents; earth resistivity

Electric fields of the atmosphere, average and variable aspects

Electrical properties of the atmosphere including the ionosphere

Relations to cosmic phenomena

Iso-magnetic and isoelectric charts and applications to navigation, wired and wireless communication, determination of subsurface geology and ore deposits

Airborne magnetic studies

(e) Oceanography

Covering the greater part of the Earth, the sea has a profound effect on man and the world in which he lives. In their interaction with the atmosphere, the oceans exercise a marked influence over climate and vegetation. Present processes of sedimentation help to interpret the geological history of the Earth. The configuration of the ocean bottom, the formation of sea ice, and the action of waves, tides, and currents have an important bearing on coastal and maritime activities. Oceanic movements together with the physical and chemical properties of sea water affect marine life and thereby influence fisheries. The sea thus presents a field of research not only for the oceanographer but also for workers in bordering branches of science. The fields of interest are:

Configuration of oceanic basins	Physical and chemical properties of sea water
Ocean-bottom deposits and short-line processes	Waves, tides, currents, and related phenomena
Interrelationships between the atmosphere and the surface of the sea	



Proposal forms with information regarding requirements for membership may be secured from the

American Geophysical Union
1330 P Street, Northwest
Washington 5, D. C.

APPENDIX E--THE WILLIAM BOWIE MEDAL AND ITS RECIPIENTS, 1939-1953

In January, 1939, Richard M. Field, then President of the American Geophysical Union, brought to a head an idea he had had for several years as a devoted admirer and younger colleague in research of a most beloved and distinguished alumnus of Trinity College (Hartford, Connecticut), Major (Dr.) William Bowie. Field's plan was for an endowment of a "Bowie Medal" to be awarded by the American Geophysical Union for outstanding achievement in cooperative research, especially when this was accomplished under unusual difficulties. Accordingly President Field sent a letter to the late Dr. Remsen B. Ogilby stating that he thought the Medal could be made possible not only by Bowie's "pet" scientific organization (the American Geophysical Union) for which he did so much, but also by his Alma Mater for which Bowie had such a loyal and warm regard. After consideration of the suggestion, President Ogilby consented to act as Chairman of a Special Committee to canvass for the necessary funds. Meanwhile a suggested design for the proposed Medal had been made by Margaret Fleming Nebeker. [She is the only child of our Honorary President. The design and drawings were made with a nominal honorarium. Many favorable comments have been received regarding the unique and most appropriate design, the motif of the obverse side of which is now used on the cover of the Transactions.--Ed.] The design for the Medal and case are shown by the accompanying reproductions of the original drawings (Fig. 2). The members of the Executive Committee of the Union voted secretly on the suggestion and proposed design early in February, 1939.

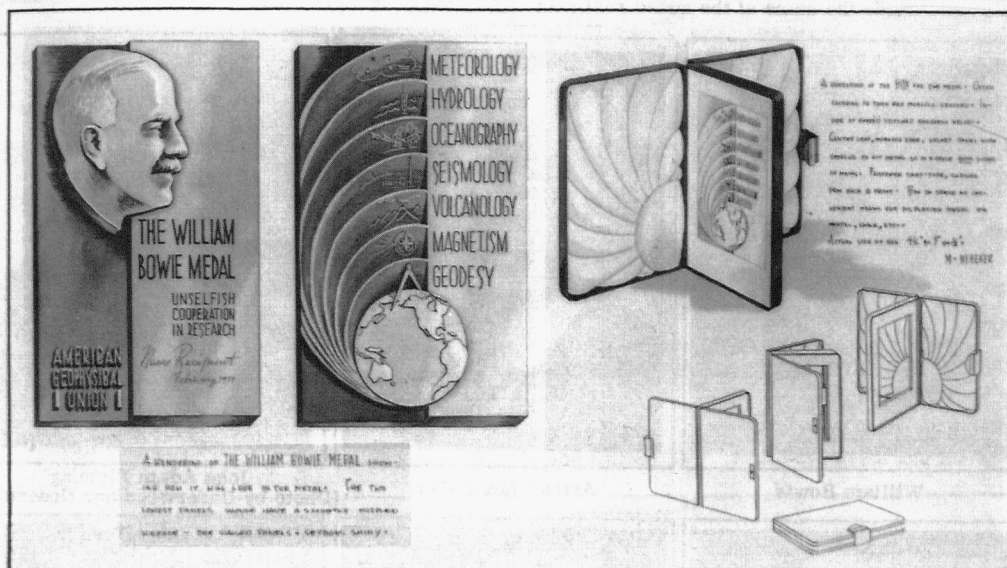
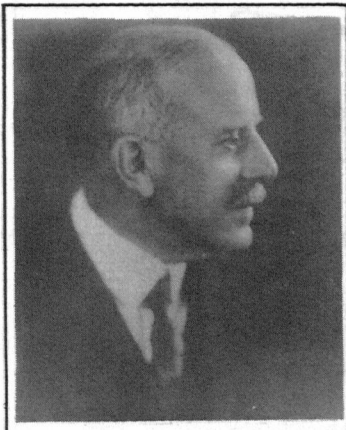


Fig. 2--Reproduction of original drawing for William Bowie Medal and case

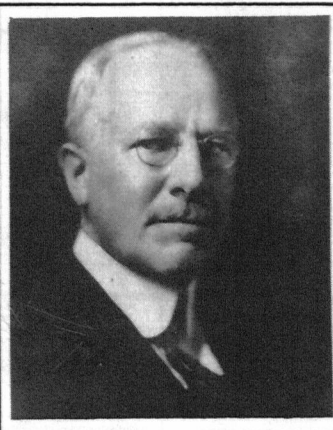
After the unanimous favorable vote of the members of the Executive Committee, an Informal Finance Committee was appointed to seek contributions to endow the Bowie Medal; this Committee consisted of President Ogilby (Trinity College) as Chairman, J. A. Fleming (Carnegie Institution of Washington) as Treasurer, Philip Kissam (Princeton University), H. G. Avers (U. S. Coast and Geodetic Survey), and Richard M. Field (Princeton University). It was not possible for the Committee to inform each of Dr. Bowie's host of friends in an appeal for funds. The Informal Committee solved this difficulty by communications to a selected list of a few of his friends. As a result, 41 friends and coworkers availed themselves of the opportunity of making contributions, individually ranging from \$1 to \$400. The total amount raised by the Informal Committee for the endowment of the Medal was \$738. Fortunately, the cost of the services for the design was most moderate and that for the engraving of the dies by the late B. Basch was less than \$200. Thus the cost of the Medal and its preparation for the first 20 awards was met by the original endowment. At the Thirty-Third Annual Meeting it was decided to revert the then small balance in the endowment to the general funds of the Union and, beginning with the award at the Thirty-Fourth Annual Meeting, to absorb the relatively small annual expense in the general expenditures of the Union.

Recipients of the William Bowie Medal, 1939-1952

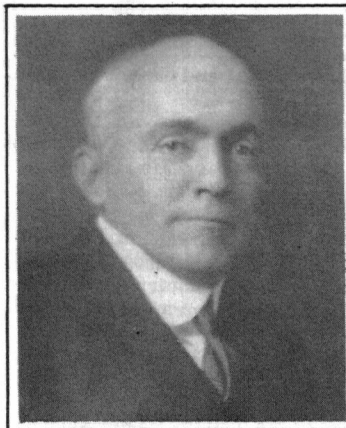
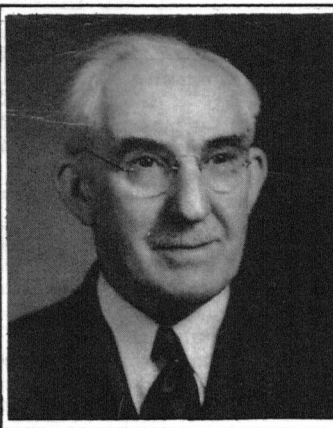
Award	Year	To	Reference in Transactions
1	1939	William Bowie ^a	v. 20, pt. 3, pp. 456-457
2	1940	Arthur Louis Day	v. 21, pt. 2, p. 726
3	1941	John Adam Fleming	v. 22, pt. 2, pp. 234-235
4	1942	Nicholas Hunter Heck ^a	v. 23, pt. 2, pp. 179-180
5	1943	Oscar Edward Meinzer ^a	v. 24, pt. 1, pp. 7-8
6	1944	Henry Bryant Bigelow	v. 25, pt. 2, pp. 214-215
7	1945	Jakob Aall Bonnevie Bjerknes	v. 26, no. 1, pp. 1-2
8	1946	Reginald Alsworth Daly	v. 27, no. 4, pp. 457-458
9	1947	Felix Andries Vening Meinesz	v. 28, no. 3, pp. 359-360
10	1948	James Bernard Macelwane	v. 29, no. 3, pp. 303-305
11	1949	Walter Davis Lambert	v. 30, no. 3, pp. 321-322
12	1950	Leason Heberling Adams	v. 31, no. 3, pp. 341-343
13	1951	Harald Ulrik Sverdrup	v. 32, no. 3, pp. 337-340
14	1952	Harold Jeffreys	v. 33, no. 3, pp. 337-340
15	1953 ^b	Beno Gutenberg	v. 34, no. 3, pp. 353-356

^aDeceased.^bAlthough this report is based on June 30, 1952, it seems appropriate to include the name of the added recipient of this Medal in 1953.--Ed.

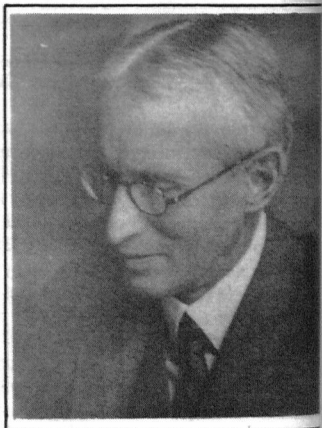
William Bowie



Arthur Louis Day

John Adam Fleming
(Photo by Underwood and Underwood)Nicholas Hunter Heck
(Photo by Harris and Ewing)

Oscar Edward Meinzer



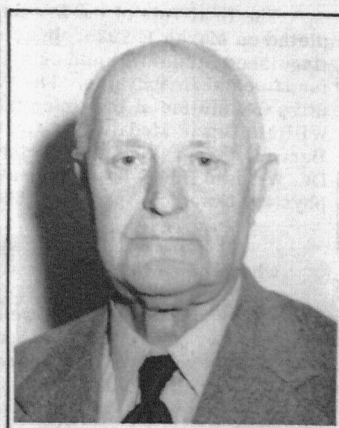
Henry Bryant Bigelow



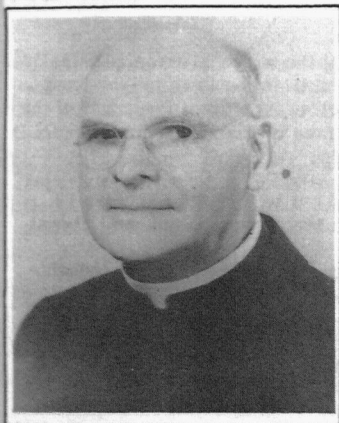
Jakob Aall Bonnevie Bjerknes



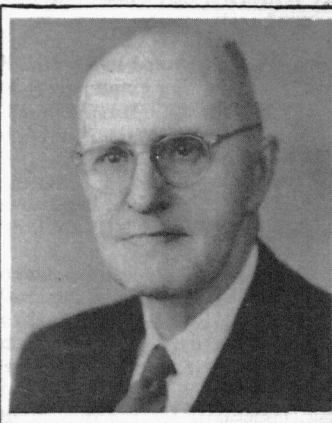
Reginald Alsworth Daly
(Photo by Fabian Bachrach)



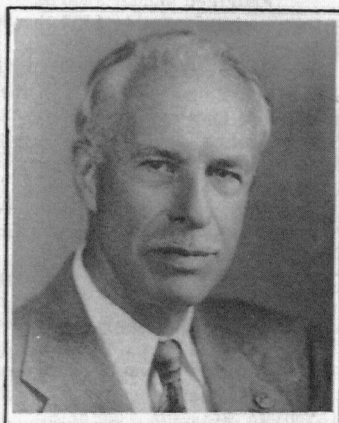
Felix Andries Vening Meinesz



James Bernard Macelwane



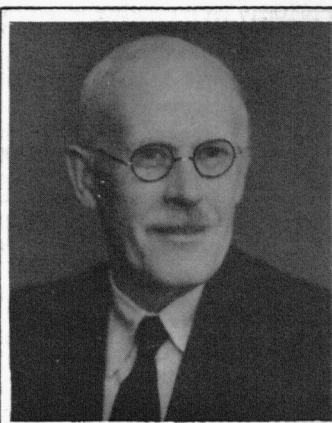
Walter Davis Lambert
(Photo by Harris and Ewing)



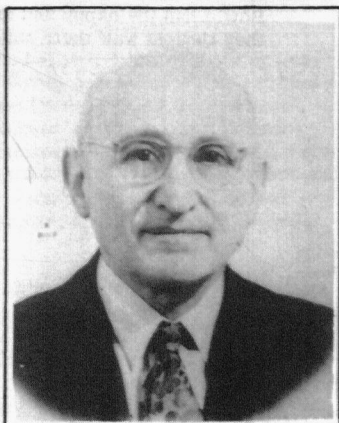
Leason Heberling Adams
(Photo by Harris and Ewing)



Harald Ulrik Sverdrup



Harold Jeffreys



Beno Gutenberg

The final vote of the Executive Committee establishing the William Bowie Medal was completed on March 1, 1939. In accordance with the deed of gift, the Medal is to be awarded for distinguished attainment and outstanding contribution to the advancement of cooperative research in fundamental Geophysics. The award has been made annually upon the authorization of the Executive Committee of the Union following recommendation of the Committee on the Award of the William Bowie Medal. The first Medal, struck off by the hydraulic press of the United States Bureau of Engraving through the courtesy of the Director, A. W. Hall, was presented to the late Dr. William Bowie by President Richard M. Field at the General Assembly of the American Geophysical Union on April 28, 1939. In his citation President Field said:

It is particularly fitting that the first award of this Medal should be made to the man whose name the Medal bears. It is not necessary here, among your intimate friends and colleagues in Geophysics, to refer specifically to your long list of scientific accomplishments and honors. But we do feel that in presenting you with the first imprint of this Medal that has been created in your name, and that of the organization for which you have worked so long and lovingly, we are not handing you a bit of stamped and engraved metal, but rather a powerful talisman of those human forces, affection, esteem, and tradition, so fundamental to the spirit of progress. It is sincerely hoped that in the years to come this Medal through its future awards will continue to promote and recognize that spirit of helpfulness and friendliness in unselfish cooperative research which you have so bountifully displayed.

Fourteen annual awards of the William Bowie Medal were made as indicated in the accompanying tabulation during 1939 through 1952.

When the Section of Tectonophysics was formed in April, 1940, the word "Tectonophysics" was added on the obverse of the Medal; there was ample space for this in the lower right-hand corner. Quite appropriately, the added designation for the new Section is against the crust of the Earth as originally depicted [see reproduction of the new obverse face of the Medal in Appendix D or on the cover of recent issues of the Transactions].

The recent correspondence with Richard M. Field has brought out in his letter of June 18, 1952, some of the thoughts upon which his idea of a William Bowie Medal was based, as follows:

The idea first occurred to me as a constructive answer to my irritation to the thoughtless behavior of so many colleagues re the Union's Committee on National Welfare and Related Functions. That is why I insisted on the term unselfish cooperation and the concept that the Medal should not be awarded to outstanding geophysicists, as such, but to those who had promoted and used Geophysics in named departments of the Earth sciences other than their regular job or field of research. There is no question but Bowie was outstanding in this unique accomplishment, especially for a federal employee. He not only had splendid imagination but also great skill in getting others to accomplish original cooperative research in the Earth sciences on land, at sea, under the sea, in the air; in fact, the whole Earth, center and circumference. Bowie was a true geonomer, according to S. Chapman's definition. Bowie had the happy and exceedingly clever ability of getting younger men to exceed what they thought was their ability. One worked hard for Bowie but it was lots of fun.

APPENDIX F--BRIEF ACCOUNT OF THE ANNUAL MEETINGS OF THE AMERICAN GEOPHYSICAL UNION AND OF ITS SECTIONS, 1919 THROUGH 1952

The following Notes and table cover the more important details of the 33 Annual Meetings of the Union and of its Sections through 1952. Some of the data given in the table in parentheses are conservatively estimated values.

The paragraphs in the Notes are for individual Annual Meetings, and briefly summarize the high lights of the meetings, with references to symposia and inauguration of new committees bearing on developments in aspects of Geophysics. These Notes include references, which, together with the data of the table, make for a fairly complete account of the evolution of the Union since 1919.

Notes regarding Annual Meetings, 1919-1952

First Annual Meeting - 1920--The meeting was devoted to an Assembly of the Union, at which each Section Chairman presented a paper on Research Problems in Geophysics, with particular reference to his Section. The Constitution was considered in detail and adopted [see Appendix B], and the Secretary, H. O. Wood, outlined the history of the organization and its functions as (1) the American National Committee of the International Union of Geodesy and Geophysics (IUGG) and (2) the American Committee on Geophysics of the National Research Council (NRC). The papers were published also in Proc. Nat. Acad. Sci., v. 6, pp. 545-601, 1920.

Fourth Annual Meeting - 1923--Symposia on (a) Status of Problems in Geophysics, all Sections, and (b) on Hot Springs (Sections of Volcanology and Geophysical Chemistry). The meeting was high lighted by a dinner at the Hotel Lafayette [see Appendix G]. The American delegates reported on the General Assembly of IUGG at Rome in 1922.

Fifth Annual Meeting - 1924--Entire meeting was devoted to discussion and no scientific papers were presented; a mimeographed report was given limited distribution. Section g-1 on Geophysical Chemistry was discontinued on May 31, 1924, as the IUGG had not provided for such a Section.

Sixth Annual Meeting - 1925--Report on General Assembly of IUGG at Madrid in 1924 by American delegates; other delegates reported on the work of four participating Associations at Madrid. Three resolutions were adopted on (1) Regarding Certain Countries as Regards Adhesion to IUGG, (2) Proposed United States Oceanographic Expedition, and (3) Topographic Mapping of the United States.

Seventh Annual Meeting - 1926--Symposia on (a) Constitution of the Earth (Union, five papers) and (b) Scientific Cooperation in the Aleutian Islands (Section f). Five resolutions were adopted on (1) Variation of Latitude, (2) Topographic Mapping of the United States, (3) Greater Uniformity in Pyroheliographic Measurements, (4) Solar Radiation Measurements and Results, and (5) Gravity at Sea.

Eighth Annual Meeting - 1927--Symposia on (a) Current Problems and Developments in Geophysics, (b) Some Factors of Climatic Control (seven papers), (c) Needs and Possibilities of Measurements of Ultra-Violet Light in Solar Spectrum and of the Ozone Content of the High Atmosphere (seven papers), and (d) Correlations of Various Radio Phenomena with Solar and Terrestrial Magnetic and Electric Activities (Section d, ten papers). An unusual number of visitors were present representing various governmental departments and universities and the National Research Council of Canada. Subsequent meetings have been attended by representatives of Canada and Mexico. An exhibit of geophysical instruments, researches, and applications was prepared and displayed April 22-29 in the exhibit rooms of the NAS.

Ninth Annual Meeting - 1928--Symposia on (a) Interrelations between the Sea and Atmosphere and Effect of these Relations on Weather and Climate (Sections c and e, 18 papers), (b) Geophysical Methods as Applied to Geological Structure (Sections a, b, and d, six papers), and (c) Figure of the Earth (Section a, four papers). A special Report on Geophysical Bulletins Covering Scope and General Rulings Concerning Proposed Publication of Bulletins on Geophysical Methods, Instruments, Results, etc., under sponsorship of the Division of Physical Sciences of NRC, and Reports for Sections a, b, c, d, e, and f were made. The papers listed include those by members of National Committees of Canada and Mexico. Nine American delegates reported on the IUGG Assembly at Prague in 1927. It is to be noted that the proposed Bulletins on Geophysical Methods, etc., were later designated Physics of the Earth Series and included ultimately nine substantial volumes

Tabulation of factual data for 33 annual meetings of American Geophysical Union during 1920 to 1952

Annual meeting	Year	Date	Registration attendance	Number of papers in Union and Sections										Place of meetings	Joint meetings	Total number of papers	Membership reported	Reference in NRC Bull. or Union Trans.
				Union	a	b	c	d	e	f	g	h	g-1					
1	1920	Apr 23	25	7	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	BS	U	7	50	NRC Rep. 13, 1920
2	1921	Apr 18-20	(25+)	0	5	0	6	5	6	0	..	..	0	..	..	22	53	NRC Bull. 3, 1922
3	1922	Mar 8	25	10Sy8	10	2	6	16	8	Sy7	..	..	0	A	U	0	59 ¹	Mimeo. only
4	1923	Apr 17-19	(25+)	10Sy8	10	2	6	16	8	Sy7	..	..	0	A,D	fg1	65	65	NRC Bull. 7, 1924
5	1924	May 3	(25+)	10Sy8	10	2	6	16	8	Sy7	..	..	0	A	U	0	..	Mimeo. only
6	1925	Apr 30-May 1	(35+)	5	8	3	6	7	5	0	..	..	1	A	U	35	..	NRC Bull. 10, 1925
7	1926	Apr 29-30	(45+)	Sy5	11	5	1Sy4	4	8	Sy7	..	..	0	A	U	45	71	NRC Bull. 11, 1926
8	1927	Apr 28-29	75+	18Sy8	7	7	Sy9	Sy11	10	7	..	..	..	A	U	60	72	NRC Bull. 61, 1927
9	1928	Apr 26-27	(75+)	2	6Sy4	Sy6	Sy15	Sy(b)	Sy(c)	5	..	..	..	A	ab,de	38	75 ¹	NRC Bull. 66, 1929
10	1929	Apr 25-26	75	0	8	5	8	Sy7	9	4	..	..	x	A	..	41	85	NRC Bull. 66, 1929
11	1930	May 1-2	(75+)	18Sy8	7	6	7	9	14	3	..	..	x	A, GU	bse	53	98 ¹	v. 10-11, 1930
12	1931	Apr 30-May 1	100	18Sy8	7	12	8	29	11	5	14	..	x	A	U	96	222	v. 12, 1931
13	1932	Apr 28-29	100	Sy9	11	Sy5	11	27	15	3	29	x	..	A,D, ID	U	110	..	v. 13, 1932
14	1933	Apr 27-28	(200)	48Sy9	8	39	11	20	15	5	39	x	..	A,D, ID, GU	U, bse	150	..	v. 14, 1933
15	1934	Apr 27-28	(250)	10	8	9	12	25	10	11	45	x	..	AB, ID, GU	U, bse	130	355	v. 15, 1934
16	1935	Apr 25-26	(275)	8Sy9	8	12	13	19	13	14	35	x	..	AB, GU	U, bse	131	612	v. 16, 2 pt., 1935
17	1936	Apr 30-May 2	(300)	3Sy4	11	22	9	24	10	9	17Sy9	x	..	AB, GU	U, bse	148	768	v. 17, 2 pt., 1936
18	1937	Apr 26-30	(350)	3Sy8	13	12	12	24	12	15	40	x	..	AB, GU	U	139	928	v. 18, 2 pt., 1937
19	1938	Apr 27-30	534	Sy6	15	12	6	21	10	12	47	x	..	AB, SI	U	129	1,007	v. 19, 2 pt., 1938
20	1939	Apr 26-28	497	7Sy8	8	1	7	26	8	7	14Sy8	x	..	AB, GW, GU	U	125	1,124	v. 20, 2 pt., 1939
21	1940	Apr 24-27	551	4Sy9	11	15	10	15	8	10	61	x	5	AB	U	148	1,264	v. 21, 1 pt., 1940
22	1941	Apr 30-May 3	479	4Py21	10	10	10	13	7	11	40	x	12	AB, D, GS	U	140	1,337	v. 22, 3 pt., 1941
23	1942	Apr 3-4	372	1Py9	9	4	9	12	8	13	45	x	4	GW	U	115	1,504	v. 23, 2 pt., 1942
24	1943	Apr 23-24	475	3Sy17	7	6	16	8	6	7	49	x	7	GW, GU	U	126	1,898	v. 24, 2 pt., 1943
25	1944	Jun 1-3	496	P13	10	13	28	15	6	4	62	x	8	GW	U, bse	102	2,151	v. 25, 2 pt., 1944
26	1945	May 31-Jun 1	485	2	10	9	16	12	8	8	19	x	7	GW	U	89	2,445	v. 26, 3 no., 1945
27	1946	May 27-29	710	4	9	10	20	11	11	7	43	x	12	GW	U	127	2,727	v. 27, 6 no., 1946
28	1947	Apr 28-30	764	5P	12	12	10	21	28	8	38	x	6	NM, L, C	U	139	2,966	v. 28, 6 no., 1947
29	1948	Apr 20-22	800	5Sy13	10	8	22	12	10	13	27	x	5Sy6	AB, D, L, NM	U	126	4,290	v. 29, 6 no., 1948
30	1949	Apr 20-22	800	3Sy9	12	11	45y6,5	12	10	8	31	x	8Sy3	AB, D, L, NM	U, ch, cd, cm	122	4,449	v. 30, 6 no., 1949
31	1950	May 1-3	865	7P3	10	12	35y9	14	21	2Sy6	7Sy4	x	4	AB, L, GS	U, cm	103	4,599	v. 31, 6 no., 1950
32	1951	Apr 30-May 2	1,000	4Sy7	11	10	12	21	17	11	35	x	8	AB, GS	U, cdM	135	4,740	v. 32, 6 no., 1951
33	1952	May 5-7	924+	2	12	7	8Sy8	17	22Sy6	12	41	x	5	AB, GS	U, cd, bM	140	4,775	v. 33, 3 no., 1952

Key to symbols—Place of meeting: AB = Auditorium or Lecture Room, National Academy of Sciences; C = Auditorium, Department of Commerce; D = Rood Memorial Hall of Carnegie Institution of Washington; ID = Department of the Interior Building; BS = National Bureau of Standards; NM = National Museum; SI = Smithsonian Institution; GS = Auditorium of General Services Building (formerly Department of Interior); GU = Georgetown University; GW = George Washington University Hall of Government; L = Interdepartmental Auditorium. Other symbols: Sy = Symposium or Symposia; P = Presidential Address; M = American Meteorological Society; S = Social Hour with refreshments, SE = Eastern Section of Sociological Society of America. Parentheses indicate papers presented for Sections at General Union Meetings or estimated entries.

¹Limit of membership increase authorized to not over 75, excluding ex-officio members.

²Limit of membership increased to not over 100, excluding ex-officio members.

³Membership made unlimited.

prepared and published during 1931-1942. Of these, two were later reprinted by the offset method to meet orders received after the original editions were exhausted.

Tenth Annual Meeting - 1929--Symposia on (a) Physical Theories of Magnetic and Electric Phenomena (Section d, seven papers), and (b) General Interest Papers on Oceanography (Union, Section e). Two resolutions were adopted on (1) Mapping Situation in the United States and (2) Topography and Control Surveys in the United States. Continued active cooperation between the United States and Canada and Mexico was evidenced by seven papers presented by representatives from Canada and Mexico.

Eleventh Annual Meeting - 1930--Symposium on (a) Utility of Geophysics by Union and an address by Sir Hubert Wilkins on Advisability of Geophysical Investigation in the Arctic by Submarine, and (b) Publication of Earthquake Data (Union, Section b). Section c discussed relations between the IUGG and the International Meteorological Committee (IMC) and heard a final report on the volume on Meteorology in the Physics of the Earth Series regarding Meteorological Units and Instruments. The program of the International Polar Year 1932-33 was discussed in Section d. Three resolutions were adopted on (1) Oceanic Magnetic Survey, (2) Replacement of the Carnegie, and (3) Seismological Stations in South America. At the Union's meeting in 1930 a Section (g) of Hydrology was authorized to conform to the Section of Scientific Hydrology of IUGG. Matters relating to hydrology referred to the American Geophysical Union had previously been looked after by a Special Committee on Hydrology.

Twelfth Annual Meeting - 1931--Symposium on Time Signals (Sections a and b, eight papers). There were numerous progress reports in all Sections as regards the United States, Canada, and Mexico. A report by 14 delegates from the United States to the General Assembly at Stockholm of IUGG was made. Four resolutions were adopted relating to (1) Gravity at Sea, (2) International Cooperation and Study of Tidal Waves, (3) Comparing of Seismological Instruments of the United States and Europe, and (4) Commemoration of the 50th Anniversary of General Greely's Participation in the First International Polar Year of 1882-1883. Section g (Hydrology) was formed November 15, 1930.

Thirteenth Annual Meeting - 1932--Symposia on (a) Application of Geophysics to Ocean Basins and Margins, (b) Applications of Seismology to Ocean Basins (Section b), and (c) the Second International Polar Year 1932-1933 (Section c). Numerous progress reports in all Sections for the United States, Canada, and Mexico. Six resolutions were adopted relating to (1) Urgent Need of Continuation of Oceanographic Work, (2) Gravity Work at Sea, (3) Apparatus for Gravity Determination at Sea, (4) Naval Observatory Time Signals, (5) Need of Non-Governmental Research Institutions on Meteorology, and (6) Commendation of Geophysical Abstracts published by the United States Bureau of Mines.

Fourteenth Annual Meeting - 1933--Five resolutions related to (1) International Polar Year 1932-1933, (2) Cosmic Rays, (3) Creation of Committee on Snow and Ice, (4) Appropriation for Scientific Investigations by the Federal Government, and (5) Naval Observatory Time Signals. Three sessions of Section b were held jointly with the Eastern Section of the Seismological Society of America. The Union received a report of the Committee on Oceanic Basins. Union had Symposium on Relation of Hydrology to Other Branches of Geophysics (nine papers).

Fifteenth Annual Meeting - 1934--Symposium on Trends in Meteorological Interpretation and Investigation (eight papers). Two resolutions adopted relating to (1) Auroral Observations at College, Alaska, and (2) Carte Bathymétrique Générale des Océans. Four delegates represented the Union at the Fifth General Assembly of IUGG held in Lisbon, 1933. First Regional Meeting was held at Berkeley, California, June 20, 1934, at the University of California with the presentation of 14 papers and in conjunction with the Annual Meeting of the Western Snow Survey Conference, cited previously. The United States Hydrographic Office published a volume of Geophysical Information and Possible Relations to Structural Problems in the West Indies, including results of two submarine expeditions sponsored by the Special Committee of the Union on Geophysical and Geological Study of Oceanic Basins.

Sixteenth Annual Meeting - 1935--Symposium on The Earth's Outer Atmosphere (eight papers). Thirteen resolutions related to (1-3) Vessels for Magnetic and Oceanic Surveys and Data for Bathymetric Charts, (4-6) Data on Geophysics, Geology, and Hydrology Obtained by the Federal Government and Coordination, (7) Recommending Publication of a Manual of Hydrology, (8-10) Establishment of Mountain Stations, Use and Design of Radio Meteorographs, and the Coordination of Snow Surveys in Mountain Regions, and (11-13) Establishment of Additional Seismographic Stations in the United States.

Seventeenth Annual Meeting - 1936--Symposia on (a) Recent Trends in Geophysical Research (Union, four papers), and (b) Ground Water (Section g). Four Special Committees reported on (1) Geophysical and Geological Study of Oceanic Basins, (2) Geophysical and Geological Study of Continents, (3) Establishment of American Journal of Geophysics, and (4) Desirability and Feasibility of Inviting the IUGG to hold its Seventh Triennial General Assembly in Washington in 1939. There was an exhibit prepared by the Committee on Geophysical and Geological Study of Continents. Four resolutions related to National Progress in Geophysics on (1) Topographic Mapping, (2) Naval Observatory Time Signals, (3) Forms for Recording Oceanographic Observations, and (4) Establishment of Hydrographic Surveys. Thirty American delegates indicated for attendance at the Sixth Triennial Assembly of IUGG to be held at Edinburgh in 1936.

Eighteenth Annual Meeting - 1937--Symposium by Section g was devoted to discussion of the General Assembly at Edinburgh and that scheduled for Washington in 1939. Fifty-one members attended and reported on the Sixth General Assembly in 1936 of IUGG at Edinburgh, Scotland. The Committee on Geophysical and Geological Study of Oceanic Basins reported completion on January 15, 1937, of expedition sponsored by the Committee in cooperation with the United States Navy, United States Coast and Geodetic Survey, the Bell Telephone Laboratories, and the American Philosophical Society. The first paid assistant clerk since 1932 for the Union was approved. Invitation for the Seventh General Assembly of IUGG for Washington was accepted at Edinburgh. As a result largely of the Union's Special Committee, the IUGG at Edinburgh established an International Commission on Geophysical and Geological Study of Oceanic Basins.

Nineteenth Annual Meeting - 1938--Symposium on (a) Physics of Volcanic Processes (Union, five papers), and (b) Discussion of Ways and Other Details for the Seventh General Assembly of the IUGG during September, 1939, at Washington. Four resolutions were adopted relating to (1) Magnetic Survey of Land and Water Areas of the United States, (2) Geophysical Survey of the Central Atlantic States, (3) Location of Meteorological Observatories, and (4) Meteorological Research Projects.

Twentieth Annual Meeting - 1939--Symposium on (a) Geophysical Prospecting (Union), and (b) Importance of Geophysics on Study of Continental Borders (nine papers). The first Award of the William Bowie Medal was made at the meeting on April 28, 1939, to William Bowie. This Medal was established by action of the Executive Committee on March 1, 1939 (see Appendix E). Five resolutions were adopted relating to (1) Long-Range Weather Forecasting, (2) Geophysical and Geological Study of Oceanic Basins, (3) Geophysical and Geological Study of Continents, (4) Seismic Activities of the Eastern Section of the Seismological Society of America, and (5) Naval Observatory Time Signals. Arrangements were completed for the Seventh General Assembly of IUGG to be held during September, 1939, at Washington. An important Regional Meeting, cited earlier, was held at Richmond, Virginia, on December 27, 1938, by the Union with Sections D (Astronomy) and E (Geology and Geography) of the American Association for the Advancement of Science in a Symposium on Importance of Geophysics to the Study of Continental Borders (nine papers).

Twenty-First Annual Meeting - 1940--Section h on Tectonophysics was established on April 9, 1940, for the purpose of promoting and encouraging research of fundamental importance to knowledge of Earth structure not covered by any of the other Sections of the Union (five papers and extended discussion, Section h). Five delegates were designated to represent the Union at the Sixth Pacific Science Congress at Berkeley and Stanford University, July 24-August 12, 1939. Six resolutions dealt with (1) Depositories for Geophysical Records, (2) Compilation and Investigation of Sounding Data, (3) Seismic Stations in the North Atlantic, (4) Seward Extension of Submarine Valleys, (5) Analysis and Publication of Data on Rainfall and Runoff, and (6) Naval Observatory Time Signals.

Twenty-Second Annual Meeting - 1941--Presidential address by R. M. Field on Geophysics and World Affairs--A Plea for Geoscience, was delivered in Elihu Root Hall of the Carnegie Institution of Washington. Symposium on (a) Dynamics of Land Erosion (Union, five papers with extensive discussion), and (b) Mechanics of Crustal Flow and Deformation (Section h, 12 papers). Three resolutions dealt with More Adequate Meteorological, Bibliographical and Abstract Services.

Twenty-Third Annual Meeting - 1942--The presidential remarks upon the Award of the Bowie Medal were followed by an address on Recent Explorations in the Mountains and Glaciers of Alaska by B. Washburn and a reception. A Special Committee on National Welfare and Related Functions was set up.

Twenty-Fourth Annual Meeting - 1943--Union's assembly in Hall of Government of George Washington University on the evening of April 24, 1943, included (a) Fifth Award of the Bowie Medal, (b) Memorial Addresses on Recently Deceased Members, David Grosh Thompson, Richard Carlyle Cady, and Max Harrison Demorest, and (c) three conferences on the Present Tentative Program of the Commission on Continents and Oceanic Structure of the IUGG, led by Chairman R. M. Field, and followed by an active discussion by more than 20 members. Eight resolutions were adopted on (1) Precise Magnetic Surveys and Mapping, (2) Essential Geophysical Observations for Duration of the War, (3) Implementation of Meteorology for War Purposes, (4) Establishment of More Stations in Oceanic Areas and Antarctica in Interest of Daily and Long-Range Forecasting, (5) Naval Time-Signal Surveys, (6) Adequate Post-War Program on Seismological Investigations, (7) Practical Post-War Program in all Branches of Geophysics, and (8) Ways and Means of Providing Employment for Geophysicists Released from War Effort during Transition from War to Peace. A progress report was submitted by the Special Committee on Establishment of an American Journal of Geophysics.

Twenty-Fifth Annual Meeting - 1944--Seven resolutions were adopted on (1) Post-War Work in Geophysics, (2) Proposed Oceanographic Work by United States Hydrographic Office, (3) Establishment of a Geophysical Station at the University of Alaska, (4) Investigation of Microseismic Phenomena, (5) Accurate Time Signals, (6) Cooperation between Nations of the Western Hemisphere in Seismology, and (7) Thanks to Major P. W. Rainier for his Account of his Effective Work in Supplying Water Supplies for the British Eighth Army in the North African Campaign. The presidential address by Walter C. Lowdermilk, Down to Earth, was followed by the Sixth Award of the Bowie Medal and Major Rainier's account. The final report of the Special Committees on Policy [Trans. 1944, pp. 339-340] and on Finance [Trans. 1944, pp. 344-348] was accepted and the Executive Committee instructed to proceed in 1945 with bimonthly publications of the Transactions. The Special Committee on Finance raised \$10,019 from 706 contributions by members and friends of the Union as required by the action of the Rockefeller Foundation in its grant of \$20,000 payable during July 1, 1944-June 30, 1947. A Special Committee on Precise Surveys and Mapping was set up. An extensive report was received and approved for plans to begin bimonthly issues of the Transactions with Volume 46 consisting of three numbers for August, October, and December, 1945. An extensive report from the Special Committee on National Welfare and Relations was received and approved (Trans. 1944, pp. 349-365). The Union attained its 25th year in 1944 and in the quarter century did much to advance Geophysics, nationally and internationally, not only as a first-order science but as the foundation of economic applications which will be increasingly valuable in the post-war period.

Twenty-Sixth Annual Meeting - 1945--Eight resolutions were adopted on (1) Cooperation between Nations in Inter-Continental Connection of Geodetic Map-Control Systems, (2) Mapping by the United States Coast and Geodetic Survey and the United States Geological Survey, (3) Suggested Federal Map Information and Distribution Office, (4) Post-War Interdepartmental Map Board, (5) Time-Signal Service, (6) Preparation of Accurate Topographic Maps in Seismic Areas, (7) Seismic Time-Signal Services, and (8) Improved Meteorological Bibliographical Service. A tabulation of educational institutions offering courses in fields of Geophysics was prepared (Trans. 1945, v. 26, pp. 463-476).

Twenty-Seventh Annual Meeting - 1946--Four resolutions were adopted on (1) Availability of Climatological Data, (2) Collection of Hemisphere-Wide Weather Reports, (3) Continuation of Association of Geodesy in IUGG, (4) Time-Signal Service. A group of members was authorized to establish a Tennessee Valley Branch at the Assembly of the Union, following the Award of the Bowie Medal. There was colored motion film on Parícutin Volcano. A supplementary list of educational institutions offering courses in fields of Geophysics was prepared [Trans. 1946, v. 27, pp. 614-617].

Twenty-Eighth Annual Meeting - 1947--Four resolutions were adopted relating to (1) Time-Signal Service, (2) Use of Metric System, (3) Ground-Water Studies of the Geological Survey, and (4) Operation Crossroads. The presidential address by L. H. Adams on the evening of April 2 was on Some Unsolved Problems of Geophysics.

Twenty-Ninth Annual Meeting - 1948--Symposium on The Crust of the Earth (Union, 13 papers). The Union's Assembly Meeting on the evening of April 21 was followed by a lecture by Commander and Mrs. Finn Ronne on their 15-month expedition in Antarctica. Six resolutions were adopted relating to (1) Time-Signal Service, (2) Navy Seismological Stations, (3) Extension of Gravimetric Net, (4) Appreciation of Ronne Expedition for Seismographic Station in Antarctica, (5) Measurement of Gravity at Sea, and (6) Geophysical Data of Commercial Companies.

Thirtieth Annual Meeting - 1949--Symposium on Turbulence and Mixing in the Sea -- Interaction between the Ocean and the Atmosphere (Union, four papers at first session and five at second session and extensive discussion). Report on Eighth General Assembly at Oslo, Norway, August 19-28, 1948, was made by the United States delegates; this was the first post-war Assembly of IUGG. Five resolutions were adopted relating to (1) Communications Services, (2) Time-Signal Service, (3) Measurement of Gravity at Sea, (4) Gravimetric Values in South America, and (5) Extension of Gravimetric Net.

Thirty-First Annual Meeting - 1950--Four resolutions were adopted relating to (1) Communications Services, (2) Time-Signal Service, (3) Antarctic Seismological Station, and (4) Naval Seismological Stations. The presidential address by W. H. Bucher was on Megatectonics and Geophysics, followed by Award of the Bowie Medal at the evening session on May 1.

Thirty-Second Annual Meeting - 1951--Four resolutions adopted on (1) Communications Services, (2) Time-Signal Service, (3) "World Days" or "International Days," and (4) Establishment of Standard Upper Atmosphere Nomenclature. There was also a discussion of a proposed resolution on the International Polar Year, 1957-1958 (to be renamed International Geophysical Year) received from Section d, but action on the resolution was postponed pending further consideration of advisability by the Union of such an International Geophysical Year. Symposium on evening of April 30 on Measurement of Geologic Time, followed by the Bowie Medal Award received on behalf of Harald Ulrik Sverdrup by the Cultural Attaché of the Norwegian Embassy.

Thirty-Third Annual Meeting - 1952--Four resolutions were adopted relating to (1) Appreciation of Cooperation with Officers of Foreign Service of the United States and the Foreign Service Operations Staff of International Trade for Making Available Special Transmission Facilities for Teleseismic Data to the United States Coast and Geodetic Survey, (2) Communications Service (3) Time-Signal Service, and (4) Increased Financial Support of International Unions. Union lectures on Origin of the Elements by R. A. Alpher and R. C. Herman, and Experimental and Theoretical Operations Research--Its Applications in Combat, Industry, and Science by E. A. Johnson. Symposium on The Upper Atmosphere (eight papers) jointly between Section c and American Meteorological Society. Round-table discussion in Section e on Oceanography. Bowie Medal Award on behalf of Professor Harold Jeffreys through the First Secretary and Educational Officer of the British Embassy. The American delegates to the Brussels Assembly in 1951 of IUGG gave a report on that Assembly.

APPENDIX G--SOCIAL FUNCTIONS AND
ACKNOWLEDGMENTS

The Union, from its beginning, has featured at its Annual Meetings and at the Triennial General Assemblies of the International Union of Geodesy and Geophysics and the separate Associations thereof, social gatherings during the scientific programs to promote free and social relations between those in attendance.

So far as the Annual Meetings are concerned, these in recent years have taken the form generally of smokers, usually at the Cosmos Club in Washington. In connection with the earlier years and with regional meetings, these have usually been lucheons and dinners.

An early example was the dinner held in Washington during the Annual Meeting of 1923 and is indicated by the menu reproduced on the next page.

In some cases, these contacts have been strengthened through the mingling at exhibits such as those prepared for the General Assemblies of the International Union of Geodesy and Geophysics (see Appendix K), showing geophysical developments and progress in the United States.

It may be recalled that upon numerous occasions the Union has been privileged to use the facilities of the George Washington University for its Annual Meetings and for the Ninth General Assembly of the International Union of Geodesy and Geophysics which was held in Washington in 1939. Grateful appreciation of this generous courtesy has been indicated in resolutions adopted at the Annual Meetings of the Union and at the General Assembly of IUGG and addressed to the Board of Trustees and to President Marvin of the University.

Georgetown University has also extended the privilege of using its facilities, particularly during several Annual Meetings for joint meetings between the Section of Seismology and the Eastern Section of the Seismological Society of America.

The U. S. Geological Survey, through the Department of the Interior, has made available meeting places for many Annual Meetings and particularly during the Seventh General Assembly of the IUGG in 1939.

Acknowledgment of numerous courtesies during many meetings and for general office quarters for many years must be made also to the Carnegie Institution of Washington.

American Geophysical Union

Annual Meeting

Washington
District of Columbia
1923

DINNER At The LaFayette

Tuesday, the Seventeenth day of April
at 7:30 p. m.

Once each year we come together to renew our
strength, like Antaeus, by touching the Earth.
—J. M. Clarke

Menu

Here let us feast, and to the feast be joined
Discourse, the sweeter banquet of the mind.
—Pope

NON OVA SED UVA

And now we go to it,
Beginning with fruit.
—Anonymous

ANTIPASTI

Apium Graveolens Olea Europea Amygdalus Commun

Call me not an olive till you see me gathered.
—Outlandish Proverbs

L'OIGNON FAIT LA FORCE

Beautiful soup! Who cares for fish,
Game, or any other dish?
Who would not give all else for two p
ennyworth only of beautiful soup?
—Lewis Carroll

Science is the great antidote to the
poison of enthusiasm and superstition.
—Adam Smith

POISSON, PAS POISON

The fish that once was caught, new bayt will hardly byte.
—Spencer

RISOTTO ALLA MILANESE

The laws of time and space and gravitation stood
Long before the news of rice and gravy tasting good.
—Anonymous

Menu

Science is a first-rate piece of furniture for a man's
upper-chamber, if he has common-sense on the ground floor.
—O. W. Holmes

GALLA OMNIS IN TRES PARTES DIVISA EST; FUNGIBUS FINGITA

Friends, like mushrooms, spring unexpected.
—Proverb

FOLIA CICHORIUM—ACETO-OLEOSE COLLOIDATA

My salad days
When I was green in judgment.
—Shakespeare

PISCATOR PERSICARUM PESSUM PISCA

An isostatic sphere formed by zero's touch
After one ecstatic taste it don't amount to much.
—Anonymous

PARVA SED APTA

Whirling ions and central nuclei
Sweet to the tooth and soothing to the eye.
—Anonymous

NERO COME LA NOTTE, DOLCE COME L'AMORE, FORTE COME LA MORTE, CALDO COME L'INFERNO

Speed the soft intercourse from soul to soul.
—Pope

IGNIS FATUUS

Thought in the early morning, solace in time of woes,
Peace in the hush of the twilight, balm ere my eyelids close.
—Kipling

Speakers

He gave man speech, and speech created thought,
Which is the measure of the universe.
—Shelley

THE TOASTMASTER

The Chairman of the Union

HON. H. W. TEMPLE

Economic Value of Governmental Scientific Work

DR. JOHN C. MERRIAM

The Contributions of Research Institutions

DR. E. E. SLOSSON

Science and the Public

J. PATTERSON, Esq.

Greetings from Canada

CAPT. F. B. BASSETT

COL. E. LESTER JONES

PROF. C. F. MARVIN

International and National Work in Geophysics

Serenely full, the Epicure may say:
"Fate cannot harm me, I have dined today."
—Sydney Smith

APPENDIX H--SUMMARY OF RECEIPTS AND DISBURSEMENTS, AMERICAN GEOPHYSICAL UNION, 1919 TO JUNE 30, 1952

During the years 1919 through 1931 funds required for the functioning of the Union, including publication, were provided by the National Research Council. During these years the annual grants of the Council for maintenance expenses varied from \$200 to \$1,000. Besides these the Council supplied also about \$7,600 for publishing some 1,250 pages of seven volumes of Transactions and one special report entitled Survey of Research Problems, and in addition the part-time salaries of a General Secretary and a Stenographer. Detailed statements of totals contributed by the Council were not available to the author.

With the rapid growth and influence of the Union and the reduction in National Research Council funds because of the depression, the National Research Council asked that annual contributions be made by each member beginning in 1932 (\$2 from 1932, \$3 from 1937, \$5 from 1946, and \$7 since 1950). Thereafter the total annual grant from the Council averaged about \$400. From April, 1932, through June, 1952, the total of annual contributions by members (regular, associate, and corporation) was \$207,429.96, sales of publications yielded \$76,564.86, contributions for special purposes other than those for the Seventh General Assembly of the International Union of Geodesy and Geophysics in 1939 (see Appendix K) amounted to \$29,016.70, grants from the National Research Council aggregated \$8,393.48, and other contributions made a grand total of \$341,990.49. Among the special grants received there should be noted those of the Rockefeller Corporation of \$20,000 in total during 1945-1947 and of the Geological Society of America of \$3,000 in 1948.

During the same interval the publication of the Transactions (11,053 pages through 1944 and 6,126 pages since 1945, all, except for 929 pages in letter press of Bulletins published by the National Research Council, printed by the offset method from master copy (prepared on a variable-spacing electric typewriter in book type since 1942) made a total of 17,179 pages equivalent to at least 25,000 pages in letter-press format. The Transactions and Bibliography of Hydrology, United States of America (400 pages) and of reprints and other publications cost \$148,476.27. The cost of maintaining paid personnel (now three clerical assistants and an Executive Secretary) since 1932 was \$119,571.18. Previously practically all services had been gratuitous. Other expenses included stationery (\$9,601.06), meetings (\$7,155.78), office equipment (\$3,383.29), and postage and communications (\$17,619.32). These with other disbursements, as shown in detail by the attached summary (Table 1) and detailed statements of receipts and disbursements, 1932 to 1952 (Tables 2 and 3), make a total of \$318,495.36.

Table 1--Summary of American Geophysical Union
accounts from April, 1932, to June 30, 1952^a

Period	Receipts	Disbursements	Accumulated cash balance
April, 1932-Dec. 31, 1936	\$ 14,488.35	\$ 13,282.76	\$ 1,205.59
Jan. 1, 1937-Dec. 31, 1941	41,784.62	36,981.87	6,002.75
Jan. 1, 1942-June 30, 1946	70,829.04	63,389.97	13,447.41
July 1, 1946-June 30, 1952	214,888.48	204,940.76	23,495.13
Totals	\$341,990.49	\$318,495.36	
Permanent Fund		7,291.06 ^b	
Cash Reserve, June 30, 1952		16,204.07	\$23,495.13
Check total		\$341,990.49	

^aCorrected for minor bookkeeping errors, 1943-1945.

^bThe Permanent Fund on June 30, 1952, consisted of Series E United States Bonds bought in fiscal year 1946-1947, \$1,850.00, and in fiscal year 1947-1948, \$518.00, at a total cost of \$2,368.00 (maturity value if held for 12 years would be \$3,200.00); deposits with Northwestern Federal Savings and Loan Association of \$400.00 in fiscal year 1948-1949, \$310.00 in fiscal year 1949-1950, \$340.00 in fiscal year 1950-1951, and \$3,758.76 in fiscal year 1951-1952, a total, including interest of \$114.31 to June 30, 1952, of \$4,823.06.

^cSee Transactions, v. 33, p. 941, Dec. 1952.

Thus for the fiscal year ended June 30, 1952, there was a Cash Reserve of \$16,204.07 available against maintenance and publication from July, 1952; there was also a Permanent Fund of \$7,291.06. By the testament of Robert E. Horton the Union, upon the demise of several beneficiaries, will receive a bequest of value estimated around \$200,000. The contributions from members, sales, miscellaneous receipts, and interest for the fiscal year ending June 30, 1953, are estimated at \$41,250, with expenditures estimated at \$40,650. [For summary of, and comments on, receipts (\$18,326.61) and disbursements (\$15,069.71) by the Union for the Seventh General Assembly of the International Union of Geodesy and Geophysics during 1939 at Washington, see Appendix K.]

The satisfactory publication program (see list of publications in Appendix J) of the Union since 1919 resulted primarily from economical methods of offset publication which, with study of methods in preparing master copy for direct reproduction, have reduced the total average cost per page (for editions ranging from 1,000 in earlier years to 5,600 as the membership and distribution increased) to less than three-quarters that of the conventional form of publication by letter press; indeed, on a strictly comparable basis of actual content of page of Transactions, the total cost per page may be only one-half as much.

Table 2--Summary of

Calendar or fiscal year	Annual contributions	Donations and grants	Grant NRC	Bowie Medal	Publications	Special funds	Services	Washington Assembly IUGG
1932	\$ 532.00	.....	\$ 561.43	.....	\$ 757.36	.....	.....	.....
1933	670.00	\$ 538.76	557.66	.....	754.37	.....	.....	.....
1934	1,158.00	979.12	375.39	.....	1,073.84	.....	.....	.....
1935	1,408.00	358.40	400.00	.....	967.28	.....	.....	.....
1936	1,653.00	212.57	400.00	.....	1,131.17	.....	.....	.....
1937	1,874.00	393.25	400.00	.....	1,409.29	\$ 1,500.00 ^e	.....	.....
1938	2,933.60	591.50	400.00	.....	2,008.69	.....	.....	.....
1939	3,584.00	433.48	400.00	\$ 738.00	2,979.29	.....	\$ 500.99 ^f	\$ 3,256.90
1940	3,821.00	.....	400.00	.....	3,930.21	.....	1,084.58 ^g	.....
1941	4,144.50	.....	400.00	.....	4,461.68	135.00	.....	.....
1942	4,748.00	4.00	102.43	.....	1,652.26	102.00	.....	.....
1943	5,994.00	.....	397.57	.....	2,082.22	2,655.00	.....	.....
1944 ^b	5,408.00	.....	167.46	.....	2,245.81	2,080.00	.....	.....
1945 ^c	7,316.33	.....	632.04	.....	3,384.81	154.13	.....	.....
1945-46	13,312.78	.....	400.00	.....	4,951.42	.....	.....	.....
1946-47	14,470.89	.....	400.00	.....	4,800.68	.....	.....	.....
1947-48	22,265.67	.....	400.00	.....	5,593.82	.....	.....	.....
1948-49	21,293.89	.....	400.00	.....	4,649.55	.....	.....	.....
1949-50	28,966.90	.....	400.00	.....	7,444.26	.....	.....	.....
1950-51	29,877.89	191.93	400.00	.....	7,837.05	.....	.....	.....
1951-52 ^d	31,997.51	313.69	400.00	.....	12,449.80	.....	.....	.....
Totals	\$207,429.96	\$4,016.70	\$8,393.98	\$738.00	\$76,564.86	\$6,626.13	\$1,585.57	\$3,256.90

^aTransfer to Permanent Fund and not included in totals. ^bJanuary 1 to June 30, 1944. ^cJuly 1, 1944 to June 30, 1945. ^dTo June 30, 1952. ^eSpecial scholarship fund. ^f\$244.88 of this is refund. ^gRefund.

Table 3--Summary of

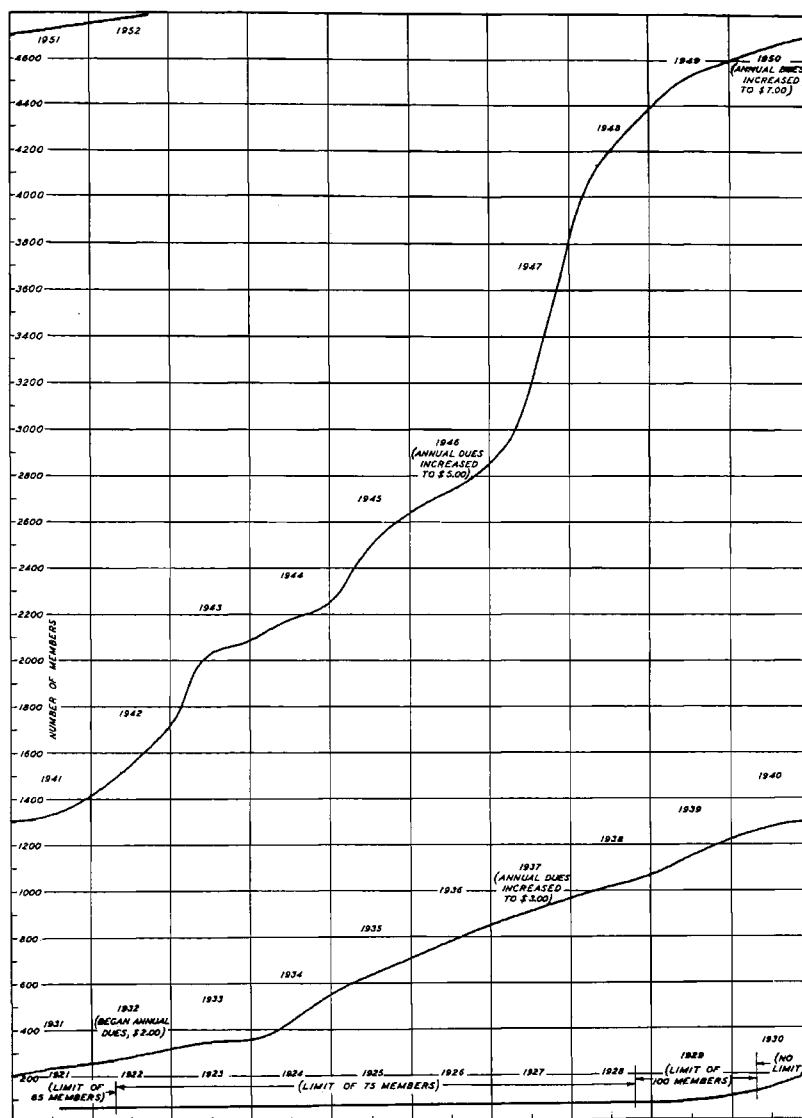
Calendar or fiscal year	Services	Publications	Meetings	Stationery	Postage, communications	Equipment	Scholarship
1932	\$ 119.49	\$ 1,317.58	.....	\$ 18.61	\$ 148.94	.....	.....
1933	221.19	1,788.72	\$ 112.00	15.41	175.10	.....	.....
1934	317.86	2,726.50	132.50	46.16	261.10	.....	.....
1935	341.92	1,836.06	177.10	81.93	275.04	.....	.....
1936	350.70	2,137.93	184.34	85.36	410.86	.....	.....
1937	571.09	3,079.10	209.27	109.56	465.96	\$ 100.31	\$ 625.00
1938	1,048.25	3,321.18	120.52	163.34	363.59	190.80	875.00
1939	1,270.08	3,840.97	149.20	191.26	516.54	.....	.....
1940	1,553.15	6,452.42	218.82	177.53	757.94	71.18	.....
1941	1,705.29	5,437.71	386.78	220.20	582.73	.....	.....
1942	2,188.31	2,064.63	419.13	250.63	552.41	16.20	.....
1943	2,021.27	4,064.16	260.72	338.75	733.03	.....	.....
1944 ^a	1,627.64	5,006.77	419.90	177.67	638.03	.....	.....
1945 ^b	10,706.19	7,757.67	385.10	830.61	1,052.60	373.27	.....
1945-46	10,842.47	8,145.15	378.22	863.57	842.57	3.70	.....
1946-47	11,859.11	9,561.48	339.08	1,104.60	918.82	495.83	.....
1947-48	16,742.35	11,747.38	584.27	1,545.67	1,165.89	552.00	.....
1948-49	15,597.29	12,338.91	427.40	885.47	1,938.61	725.40	.....
1949-50	12,062.12	16,953.18	669.22	743.62	2,055.19	307.22	.....
1950-51	14,281.16	17,921.21	835.14	915.20	1,828.27	307.72	.....
1952 ^c	14,144.25	20,977.56	747.07	835.91	1,936.10	239.66	.....
Totals	\$119,571.18	\$148,476.27	\$7,155.78	\$9,601.06	\$17,619.32	\$3,383.29	\$1,500.00

^aJanuary 1 to June 30, 1944. ^bJuly 1, 1944 to June 30, 1945. ^cTo June 30, 1952. ^dThese are not included in totals for 1932-1952. ^e\$244.88 of this is refund. ^fRefund.

[illegible]

APPENDIX I--MEMBERSHIP, DATES OF INCREASE IN LIMIT OF
MEMBERSHIP, AND ORIGIN AND INCREASE OF ANNUAL
DUES, AMERICAN GEOPHYSICAL UNION, 1921-1952

The accompanying diagram is a record of the membership and annual contributions from members, as authorized by the National Research Council, beginning in 1932. The remarkable growth in membership shown is the result of the successive Committees on Membership and their respective Chairmen. The Union is particularly indebted to H. Freeborn Johnston, for many years Chairman and now a member of the Committee; he has most unselfishly devoted his leisure spare time to the selection of prospective members. The Union is much indebted to him for its growth in number of members and thereby to the success in bringing Geophysics to the stature of a profession. In June, 1952, the total number of members was nearly 5000, including regular, associate, corresponding (foreign), life, and ex-officio members all over the world.



Membership, dates of increase in membership limit, and origin and increase of annual dues, American Geophysical Union, 1921-1952

APPENDIX J--LIST OF PUBLICATIONS OF THE AMERICAN
GEOPHYSICAL UNION FROM 1920 TO 1953
(Corrected to January 15, 1954)

Volume No.	Year	Title	No. pages	Price postpaid
1	1920*	Transactions (Reprint and Circular Series, National Research Council No. 11)	57	\$0.60
2	1921*	Transactions (Bull. National Research Council, No. 17) . .	108	1.50
3	1922*	Not published	..	..
4	1923*	Transactions (Bull. NRC, No. 41)	150	2.00
5	1924*	Not published	..	..
6	1925*	Transactions (Bull. NRC, No. 53)	80	1.00
7	1926*	Transactions (Bull. NRC, No. 56)	134	1.25
8	1927*	Transactions (Bull. NRC, No. 61)	297	3.00
9	1928*	Transactions (Bull. NRC, No. 68)	103	1.00
10-11	1929-30*	Transactions (all Sections)	314	1.50
12	1931*	Transactions (all Sections)	229	1.50
13	1932*	Transactions (all Sections)	401	2.00
14 ^a	1933*	Transactions (all Sections)	521	2.50
15	1934*	Transactions Part I (all Sections except Hydrology)	258	1.25
	1934*	Transactions Part II (Hydrology)	376	1.50
16	1935	Transactions Part I (all Sections except Hydrology)	364	2.00
	1935*	Transactions Part II (Hydrology)	166	1.50
17	1936*	Transactions Part I (all Sections except Hydrology)	260	1.50
	1936*	Transactions Part II (Hydrology and Regional Meetings, Hydrology)	304	2.00
18	1937*	Transactions Part I (all Sections except Hydrology)	264	1.75
	1937*	Transactions Part II (Hydrology and Regional Meetings, Hydrology)	300	2.25
19	1938*	Transactions Part I (all Sections)	585	3.50
	1938*	Transactions Part II (Regional Meetings, Hydrology)	159	1.25
20	1939	Transactions Part I (Regional Meetings, Hydrology)	140	1.25
	1939	Transactions Part II (Symposium on floods)	94	1.00
	1939*	Transactions Part III (all Sections except Hydrology)	250	1.75
	1939	Transactions Part IV (Hydrology)	257	1.75
21	1940	Transactions Part I (Stanford University, Regional Meetings, Hydrology)	144	1.25
	1940*	Transactions Part II (Washington Annual Meetings, all Sections)	632	3.75
	1940	Transactions Part III (Richmond Symposium and Seattle Regional Meetings, Hydrology)	285	1.75
	1940	Transactions Part IV (Columbus symposia: Applications of mathematics in the earth-sciences and Hydrologic problems in the Ohio and Michigan basins)	86	1.00
22	1941	Transactions Part I (Sacramento Regional Meeting, Hydrology)	216	1.50
	1941	Transactions Part II (Washington Annual Meetings, (all Sections except Hydrology)	368	2.50
	1941	Transactions Part III (Washington Annual Meeting, Hydrology)	452	3.00
23	1942*	Transactions Part I (Dallas and Pasadena Regional Meetings, Hydrology)	172	1.25
	1942*	Transactions Part II (Washington Annual Meetings, all Sections)	570	4.50
24	1943*	Transactions Part I (Washington Annual Meetings, all Sections except Hydrology)	332	3.50
	1943*	Transactions Part II (Washington Annual Meeting, Hydrology)	454	4.00
	1943	Transactions Part III (Corvallis Regional Meeting, Hydrology, and Western Snow Conference) and Addendum	105	1.00

^aAlthough Transactions of 1933 as a whole are exhausted, the Papers and Reports of the following Sections are available: Meteorology, 40 pp., \$0.40; Hydrology, 185 pp., \$1.50.

*Out of print.

LIST OF PUBLICATIONS

Volume No.	Year	Title	No. pages	Price postpaid						
25	1944	Transactions Part I (Berkeley Regional Meeting, Hydrology, and Western Snow Conference).	187	\$2.00						
	1944	Transactions Part II (Washington Annual Meeting, General Assembly, Geodesy, Seismology, Minutes all Meetings).	203	2.00						
	1944*	Transactions Part III (Washington Annual Meeting, Meteorology)	138	1.50						
	1944*	Transactions Part IV (Washington Annual Meeting, Terrestrial Magnetism and Electricity, Oceanography, Volcanology, and Tectonophysics).	142	1.50						
	1944	Transactions Part V (Washington Annual Meeting, Hydrology: Reports).	160	1.50						
	1944	Transactions Part VI (Washington Annual Meeting, Hydrology: Papers)	236	2.00						
Beginning of bimonthly			Feb.	Apr.	June	Aug.	Oct.	Dec.	No. of pages	Volume
26	1945		....	....	....	\$1.50	\$1.50	\$1.50	482	\$3.75
27	1946		\$1.50	\$1.50	\$1.50	1.50	1.50	1.50	926	7.50
28	1947		1.50*	1.50*	1.50*	1.50	1.50	1.50	980	7.50**
29	1948		1.50	1.50 ^b	1.50	1.50 ^c	1.50	1.50	956	7.50
30	1949		1.50 ^b	1.50	1.50*	1.50	1.50	1.50	950	7.50**
31	1950		2.00*	2.00	2.00	2.00	2.00 ^c	2.00	968	9.00**
32	1951		2.00*	2.00*	2.00	2.00*	2.00	2.00	964	9.00**
33	1952		2.00	2.00	2.00	2.00*	2.00* ^c	2.00*	956	9.00**
34	1953		2.00*	2.00*	2.00*	2.00	2.00	2.00	986	9.00**
35	1954	The price of \$9.00 has been set for subscriptions.								
Special publications										
	1920-44	Index (combined author and subject), volumes 1-25							144	4.00
		Bibliography of Hydrology, United States of America:								
	(1937)*	Years 1935 and 1936							78	0.30
	(1938)*	Year 1937							68	0.30
	(1939)*	Year 1938							78	0.30
	(1940)	Year 1939							86	0.50
	(1941)	Year 1940							90	0.85
		Years 1941-1950 available through Government Printing Office, Washington, D. C., at a price of \$1.75 . .							408	...
		Lists of Members and Officers ^d								
	1948	July 10, 1948 (Part 2 of August 1948)							79	1.00
	1950	September 10, 1950 (Part 2 of October 1950).							116	1.50
	1952	September 10, 1952 (Part 2 of October 1952).							120	1.50
		Survey of Scientists Engaged in Geophysical Researches (for U. S. Research and Development Board), June 25, 1948, not available for distribution							158	...

^bAvailable only in complete or remaining partial sets.

^cWith these numbers, a Part 2 was issued, separately paginated, as a list of members and officers. These are not included in the volume or set, but may be purchased separately. They are listed directly above under the special publications.

^dEarlier lists of members, published in 1939, 1940, 1942, 1943, and 1947 no longer available.

*Out of print.

**In these cases, the complete volume is not available. Orders including all remaining issues of a volume may be placed at a pro rata rate; for example, five of the six numbers for 1950 are still available, the price being 5/6 of \$9.00 or \$7.50.

In addition to the publications noted above, 47 special exhibits (chiefly maps) were prepared in 1939, these relating to the work of the Special Committees on the Geophysical and Geological Study of Ocean Basins and of Continents for the Seventh General Assembly of the International Union of Geodesy and Geophysics. Ozalid prints of these will be made on order. Information concerning them will be supplied on application [see Appendix K].

Orders, with checks payable to the American Geophysical Union, should be addressed to
American Geophysical Union
1530 P Street, Northwest
Washington 5, D.C., U.S.A.

APPENDIX K--INTERNATIONAL ASPECTS OF THE AMERICAN GEOPHYSICAL UNION

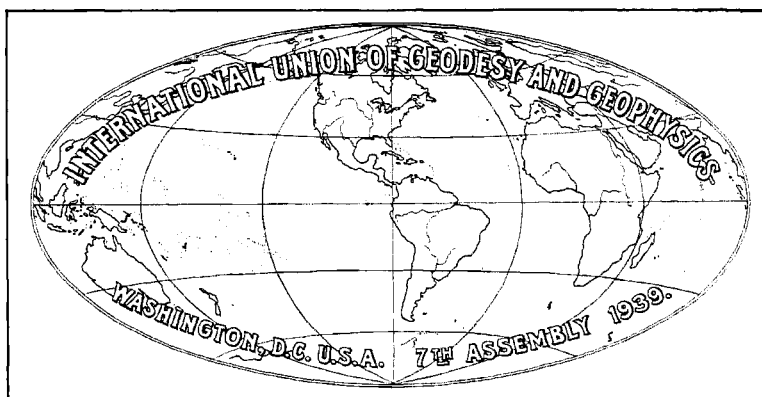
Some aspects of the functioning of the American Geophysical Union as the National Committee from the United States have already been discussed. Brief supplementary information is added here.

The Union has made free distribution of about 200 copies of its Transactions each year to members abroad of the International Union of Geodesy and Geophysics and to other interested geophysicists and geophysical organizations. During later years many prominent geophysicists of Central and South America, Australia, Europe, China, Africa, Great Britain, Pakistan, and India have taken advantage of the provision in the Statutes of the Union by which "the nationals of other countries . . . elected by the Executive Committee of the Union may become members although they may not vote or be officers of the Union or of its Sections, or delegates of the Union to International Assemblies or Meetings." At the present time (July 1952) a total number of foreign addresses to which the Transactions are regularly sent either because of individual paid membership or as free exchange in countries other than the United States is approximately 900.

The Union has been represented by delegates and guests, in increasing numbers, at each of the nine General Assemblies of the International Union of Geodesy and Geophysics. All of these Assemblies, except the Seventh in 1939, were held in European cities. The United States delegates and guests at the Brussels (Ninth Assembly) in 1951 numbered more than 100.

The Seventh Assembly was held in Washington through the efforts of the Union in cooperation with the Department of State and other groups. That Assembly was judged by our foreign colleagues to be one of the most successful from both points of view of attendance and scientific discussion.

To accomplish this undertaking the American Geophysical Union found, in addition to its own funds, some \$18,327 to cover expenses. In addition to gratuitous services of many members, over one-sixth of the funds expended was provided through donations by members and friends of the Union. The remainder was obtained through generous special grants from (1) the United States Government, (2) the National Research Council, (3) the Geological Society of America, and (4) the Carnegie Corporation, in almost equal shares of \$2,700 after refund of \$300 to each of the last three named.



Special emblem, prepared by the U. S. Coast and Geodetic Survey, for General Assembly in Washington in 1949

It was fortunate indeed that the Seventh Assembly, coming at the time almost simultaneously with the outbreak of hostilities, was held in the United States. Despite the interference since then, as a result of World War II, with the operation of the International Union of Geodesy and Geophysics, it has been possible, with our colleagues in the various member countries of the United Nations, to maintain a considerable part of the functioning of the international body. Thus its continuance was ensured and certainty of resumption of its important program assured promptly at the end of the War. This was done largely through the efforts of the officers of the International Union in Great Britain and those in the United States.

The accompanying statement shows the receipts and disbursements at the close of business December 18, 1939, for the Seventh General Assembly of the International Union of Geodesy and Geophysics. The disbursements in this statement included payments made for expenses of three International Associations at the Washington Assembly upon due authority for subsequent reim-

bursement. Bills receivable (December 18, 1939) on account of these for reimbursement to the Finance Committee of the Assembly totalled \$332.49.

Summary of report of Treasurer of Finance Committee for
Washington Assembly as of December 18, 1939

Receipts

United States Government.	\$2,660.68	
National Research Council	3,000.00	
Geological Society of America.	3,000.00	
Carnegie Corporation of New York.	3,000.00	
American Geophysical Union members (\$2,664.20) and friends (\$1,491.50).	4,155.70	
Registration fees	2,047.50	
Miscellaneous refunds in 1939.	462.73	
Total Receipts.		\$18,326.61

Disbursements by Washington Assembly Committees

Organizing.	\$1,158.09	
Finance.	100.00	
Local secretaries	53.68	
Coordinated interests	40.20	
Meeting places, hotels, etc.	38.20	
Office	7,239.25	
Publicity.	487.45	
Travel	855.37	
Exhibits	394.74	
Entertainment	2,863.62	
Ladies entertainment.	432.90	
Special exhibit	913.05	
Special contingency.	493.16	
Total disbursements.		15,069.71
Balance		\$ 3,256.90

Many American delegates and guests at the Assembly, including a large number of the members of the American Geophysical Union, asked that they be supplied, if possible, with copies of the printed transactions of one or more of the Associations and of the International Union. These requests totalled over 1500 volumes. An appropriate liability was assumed by the Union on this account.

The allotment from the United States Government was \$4,500.00, of which (largely because of the non-attendance of about 50 pct of those who had expected to attend from abroad) only \$2,660.68 was expended, through the Department of State for services, printing, and entertainment. The balance in the Government allotment was \$1,839.32 and was reverted. The cost of 1800 volumes of transactions and mailing was estimated at \$1,756.90, which left an unexpended balance in the funds of 1,500.00 plus bills payable of \$332.49. The net balance of receipts was prorated, by action of the Union's Executive Committee, on the basis of original contributions of \$3,000.00 each (1) from the National Research Council, (2) from the Geological Society of America, and (3) from the Carnegie Corporation of New York, with revertments to each of \$300.00.

Special publications and exhibits were prepared in connection with the Seventh General Assembly as shown on the accompanying lists.

Special publications by the American Geophysical Union in connection with the General
Assembly of the International Union of Geodesy and Geophysics at Washington in 1939

List of Delegates and Guests, IUGG, Seventh General Assembly, Washington, Sept. 4-15, 1939; 96 pp., with 488 reproductions of photographs of over 80 pct of delegates and guests, Washington, 1939.

Day-by-Day Program of Activities of the Washington Assembly of the International Union of Geodesy and Geophysics and its seven Associations; a leaflet 8 1/2 by 21 inches, showing activities for each day of meetings for the Union and for each of the Associations, folded to 8 1/2 by 5 1/4 inches, Washington, 1939.

Que Faut-il Voir à Washington? Guide Concis de la Capitale des Etats Unis, an authorized translation of the English brochure (third and revised edition) by Mary O. Sumner; for distribution to the delegates and guests attending the Washington Assembly; 31 pp. with numerous half tones of buildings and places of interest, Washington, 1939.

Special exhibit maps of the American Geophysical Union assembled for Seventh
General Assembly, International Union of Geodesy and Geophysics in 1939

No.	Description	Number of sheets	Size of map (no margins)		Price ^a post- paid
			N-S	E-W	
			inch	inch	
1	Reconnaissance structure-contour map of surface of basement-complex in U. S.	4	45 1/4	72 1/2	\$6.00
2	Iso-anomaly map of U. S., 60-km depth of compensation (1936)	2	48	75 3/4	6.00
3	Iso-anomaly map of eastern U. S., 113.7-km depth of compensation (1938)	1	47	35 1/2	3.00
4	Normal warp iso-anomaly map of U. S. (1937)	1	46	40	3.00
5	Gravitational and structural trends in eastern U. S.	1	40	27 1/2	3.00
6	Gravity profiles across eastern U. S. (1938)	1	16	16 3/4	0.40 ^b
7	Geologic map of the U.S. (U.S. G.S. Pub.)	4	50	75	...
8	United States seismic-epicenter map	1	42	78 1/2	4.50
9	"Geothermal-gradient" map of the U. S.	4	45	72 3/4	5.00
10	Map showing variation of carbon ratios of Cretaceous and Tertiary coals in U. S.	1	29 1/4	37 1/4	1.50
11	Map showing variation of carbon ratios of Carboniferous coals in the U. S.	1	24 1/2	34	1.50
12	Geologic map of Beartooth-Bighorn-Black Hills Region	1	28 1/2	69 1/2	4.50
13	Iso-anomaly map of Beartooth-Bighorn Region	1	38 1/4	43 1/2	3.00
14	Normal warp iso-anomaly of Beartooth-Bighorn-Black Hills Region	1	28	52	2.00
15	Geologic and gravitational profiles across Beartooth-Bighorn-Black Hills Region	1	16 3/4	41 1/2	1.25
16	Geologic map of New Jersey (N. J. State G.S. Pub.)	1	46 1/2	25	...
17	Seismic and geologic cross-section for Barnegat Bay traverse, New Jersey	1	26	48 1/2	2.00
18	Cape May, New Jersey, seismic and geologic profiles	1	32	70	6.00
19	New Jersey velocity-gravity sections on Cape May and Barnegat Bay profiles	1	40 1/2	36 3/4	3.00
20	Structural analysis of geologic-seismic data for the Plainsboro area, New Jersey	1	22 1/2	41 3/4	1.50
21	Map showing extension of the Palisades Diabase (N.J.) based on magnetic and geologic data	1	18 1/4	40 3/4	1.25
22	Key map showing location of geophysical sections across Atlantic Coastal Plain	1	27 1/4	19 1/4	1.25
23	Geologic map of Virginia Region	1	19 1/2	24 1/4	0.75
24	Basement-surface contour map, Virginia	1	18 1/4	25 1/4	0.75
25	Gravity iso-anomaly map of Virginia Region	1	18 3/4	25	0.75
26	Seismic, gravitational, and geologic profiles for Cape Henry, Virginia, and Barnegat Bay, N.J., sections	1	18	19 1/2	0.75
27	Geologic, gravitational, and "computed-density" sections across Virginia Region	1	16 3/4	23 3/4	0.75
28	Bathymetric map of Bermuda area	1	17	19 1/2	0.75
29	Bathymetric cross-sections, Bermuda area	1	13 3/4	23 1/2	0.75
30	Cross-section of Bermuda Seismograph Station	1	18 1/4	26 1/2	0.75
31	Chart showing correlations between weather conditions, rate of tilt, and microseismic activity at Bermuda	1	20 3/4	54	2.25
32	Map showing position of Bermuda relative to Mid-Atlantic Seismic Zone	1	16 1/4	11 1/4	0.40
33	Isogonic map of Bermuda (1935)	1	9 5/8	18 1/8	0.40
34	Vertical-intensity magnetic map of St. George's, Bermuda	1	17	20 3/4	0.40
35	Graphic illustration of shallow-water marine seismic technique	1	24	40 1/8	1.50
36	Graphic indication of moderate-depth marine seismic technique	1	27 3/4	40	2.00

(Continued)

Special exhibit maps of the American Geophysical Union assembled for Seventh General Assembly, International Union of Geodesy and Geophysics in 1939 (concluded)

No.	Description	Number of sheets	Size of map (no margins)		Price ^a post-paid
			N-S	E-W	
			inch	inch	
37	Graphic indication of deep-sea seismic technique	1	29 1/4	40 1/4	\$2.00
38	Chart indicating comparative depths at which marine seismic work is being done	1	40 1/2	17 5/8	1.25
39	Diagram showing recording oscillograph as used in deep-sea seismic measurements	1	40 1/4	26 3/4	1.50
40	Iso-anomaly map of Gulf-West Indian Region	1	30 1/2	51 1/2	3.00
41	Map showing geophysical methods used in discovery of Texas and Louisiana Gulf Coast Oil Fields	1	35	32	3.75
42	Map showing geophysical method used in discovery of oil fields in Illinois Basin	1	32 1/2	25 1/2	2.25
43	Basement-surface sections across United States	1	19 1/2	58	2.00
44	Gravitational and basement-section across U. S.	1	35	32	3.00
45	Gravity-station map of U. S. (1939)	2	49 1/2	75	5.25
46	"Vertical-intensity" magnetic sections across Palisade Diabase (Sill)	1	45	39	3.00
47	Graph comparing oil production and estimated reserves of oil and new fields, Illinois Basin, July, 1939	1	20	11 1/4	0.40
48	Graph comparing oil production and estimated reserves, Gulf Coast Region	1	18 1/2	42 3/4	1.25
49	"Vertical-intensity" magnetic section along Barnegat Bay traverse	1	32	47 3/4	1.25
50	Model showing approximate configuration of surface of basement complex in U. S.	Approx. 50 by 75 inches			... ^d

^aPrices are for ozalid prints made on order - minimum order \$4.00; prices subject to change.

^bThe regular U. S. Geological Survey 1/2,500,000 geologic map of the United States was used as special exhibit 7 for comparison with exhibits 1-11.

^cThe New Jersey Geological Survey's regular 1/250,000 State map was used as special exhibit 16 for comparison with exhibits 17-21, etc.

^dNo longer available.

American Geophysical Union Excursion to Luray, Virginia, Sunday, September 10, 1939, description of points of scenic, historic, and geologic interest between Washington, D. C., and Luray, Virginia, by Marcellus H. Stow (of Washington and Lee University) and Luray Caverns in Virginia, by William H. McGill (Assistant State Geologist of Virginia), 20 pp. with map of the Excursion prepared by the U. S. Geological Survey (scale, one inch = four miles).

Road Map of Washington and Vicinity, 1938, prepared by the Geological Survey of the U. S. Department of Interior, 16 1/2 by 20 inches, scale four miles to one inch (folded for pocket use), 4 1/4 by 5 inches, Washington, 1938.

International Association of Geodesy, Seventh General Assembly, Washington, September, 1939, 64 pp., Washington, 1942.

Washington Standard Guide (revision of 1939), 200 illustrations and 163 pp., and insert of Reference Map and Index of Washington (scale 3 3/4 inches = 1 mile); published by B. F. Reynolds Co., Washington, 1939.

Publications, specially prepared by others,
presented to each delegate and guest

Descriptive Pamphlet of Mount Vernon, Virginia, issued by the Mount Vernon Ladies' Association; folded into 8 pp., four by nine inches, May, 1939.

Guide Map of Capital Transit Street Car and Bus Lines, by the Capital Transit Company, 27 by 50 inches folded to 4 by 8 1/4 inches, with half-tone and descriptions of chief places of interest, key, and index of routes, streets, etc., Washington, 1939.

Pamphlet of the George Washington University at Washington, with historic and descriptive accounts of its formation and sketch of campus and buildings; 16 pp., 9 by 12 inches.