Division of Earth Sciences
1952-1974

This collection contains the records of the activities of the Division of Earth Sciences from 1952-1974 and spans approximately 4 linear feet.

A Brief History of the Division of Earth Sciences (April 1968)

Note: The narrative below is adapted from a history of the National Research Council's Division of Earth Sciences prepared by Chester R. Longwell, a past Chairman of the Division, and published in the Division's Earth Sciences Newsletter No. 3, April 1968.

Dr. Longwell joined the Division in 1922 as a member of the Committee on Tectonics, which he later chaired. He was Chairman of the Division (then called the Division of Geology and Geography) during the years 1937-1940. Dr. Longwell was elected to membership in the National Academy of Sciences in 1935.

This brief history provides perspectives on important early activities of the Division.

Varied aspects of science in this country had their inception and primitive growth shortly before and after the start of the nineteenth century. Growth was generally rapid, and in 1848 the need for communication and cooperation among scientific groups led to organization of the American Association for the Advancement of Science, the earliest country-wide grouping of our scientific disciplines. Close coordination between organized science and the national government began in 1863, when the National Academy of Sciences was established by act of Congress. Distinguished geologists were among the early members of the new official organization. Recommendation by the Academy led to the establishment, in 1878, of the U.S. Geological Survey, marking a major advance in the growth and orientation of earth science.

Planning and supervision of scientific research and development became a major concern of the National Academy. Limited in membership and other resources, the organization was not fully equipped to direct and unify the burgeoning research in the many branches of science. In 1916, at the request of President Woodrow Wilson, the Academy started organization of the National Research Council as its operating arm—to provide scientific and technical advice to the government, to stimulate research, to formulate constructive projects, and to aid in coordinating the growing efforts of scientists within the United States and allied countries.

Our involvement in World War I delayed completion of plans for the newly created Research Council. The Division of Geology and Geography was organized in May 1919, when 15 geologists and geographers assembled in Washington, D.C., under the leadership of Whitman Cross, of the U. S. Geological Survey. Officers of the Division, named later that year, included as the first Chairman Edward B. Mathews, well-known petrologist at Johns Hopkins University. In the continued operation of the Division through nearly half a century there have been 22 chairmen, with terms of office ranging from one to three years. These individuals have represented a wide range of interests in the earth sciences, and came from many organizations, with a wide geographic distribution.

W. H. Twenhofel, Chairman in the years 1931-1934, aptly summarized the purposes of the Division, beyond those related to the general NRC function of advisor to the government, as follows:

To promote cooperation and coordination among scattered researchers in the same field; to cooperate in promotion of promising research; to bring promising projects of research to the attention of those willing to give financial or other assistance; to stimulate research by proposal of problems involving several fields of inquiry.

The Role of the Division's Committees

The functioning of the Division has been carried out largely through the activities of its committees, which through the years have varied in number and in individual life span. Some standing committees are chiefly administrative in function, an essential element in the operation of any large organization. The Division's Executive Committee is an example of this type of body. The scientific committees are the basic organs of our Division as a constructive scientific unit. Through the years the panel of committees has changed not only in numbers but also in response to changes in emphasis in the earth sciences. Some committees have achieved their main objectives within a few years; others have continued in profitable operation through 20 years or more. The constructive performance of several committees that were operative early in the history of the Division is here outlined briefly.

The Committee on Measurement of Geologic Time was organized and led by Alfred C. Lane, widely known as an able teacher and devoted scientist. Study by the committee began at an exceptionally favorable stage in the development of ideas and evidence concerning the age of our planet. As late as the year 1900, the estimate by Joly and Clarke of 100 million years for the age of the oceans was widely accepted as a first approximation to the length of geologic time. In 1907, the Yale chemist B. B. Boltwood, having demonstrated that lead is produced by slow disintegration of uranium, suggested that ages of rocks may be indicated by ratios between uranium, thorium, and associated lead contained in rocks. These values, some exceeding 2 billion years, were accepted by the British geologist Arthur Holmes and by Joseph Barrell. Adolph Knopf, becoming associated with Boltwood in 1920, added his approval of the new concept. Both Knopf and Holmes were members of Lane's committee, which became operational in 1923. At annual meetings of the Division the report of that committee was greeted with particular interest and lively discussion. Several universities and research organizations contributed funds for investigations and fellowships to advance knowledge in this fascinating field. Rapid progress in the project is documented in a bulletin entitled "The Age of the Earth," published by the Research Council in 1931.

Other early divisional committees, concerned with problems of stratigraphic correlation, gave particular attention to the value of microfossils. Considerable progress had been made in the knowledge and use of the Foraminifera as guide fossils, particularly through the efforts of Joseph A. Cushman, who for some time was chairman of the Subcommittee on Micropaleontology. Carl O. Dunbar, before and during his chairmanship of the Committee on Stratigraphy, devoted attention to fossil forms of the Fusulinidae, especially abundant in some late Paleozoic marine formations. Rapid evolution of the forams and fusilinids, evident in striking changes in form through limited thicknesses of strata, has made these small fossils especially useful for accurate correlation across continents.

The Committee on Tectonics, initiated in 1922, had as its goal a published map showing all major geologic structural units in the United States. Assembling and evaluating information already in published form was in itself a major task. In addition, quantities of unpublished material were made available by state geological surveys and by the U. S. Geological Survey, by university departments and personnel, and by commercial organizations, such as the petroleum and mining companies. Completion of the formidable project required not only much organized effort but considerable time; more than 20

years had elapsed before the printed product appeared. The resulting map was a first edition, which in later years has been updated on the basis of continuing field studies.

The three projects outlined above may be regarded as random samples. Many other accomplishments by organized groups can be cited to illustrate the activities of our Division in advancing research in the varied aspects of our science.

Progress through the Years

The first 50 years of the history of our Division will end in May of 1969. Considerable change has occurred within that time. Realization grew that the original name, Division of Geology and Geography, was not adequate as a designation for the varied group of disciplines included in this scientific league. In fact there have been active divisional committees in geophysics through most of the years since 1919. The activities undertaken by the Division represent a broad spectrum of interests in the study of the earth, its physical character, its resources, and its history. These related fields of activity are logically grouped as the earth sciences, and the designation Division of Earth Sciences was, therefore, officially chosen in 1952.

Committees continue as the chief operating arm in carrying on and recording a comprehensive program. The interests and objectives of such study groups have changed markedly through the decades. The oceans are now a major frontier, and reports of the Committee on Oceanography command wide interest. The important role of this study group is indicated by its list of sponsors: Office of Naval Research, National Science Foundation, Atomic Energy Commission, Bureau of Commercial Fisheries, and Environmental Science Services Administration. The Committee on the Alaska Earthquake, established shortly after that major seismic event, has in preparation an 8-volume report. The Screening Committee for the Foreign Field Research Program, active since 1955, has made a total of 97 awards for field studies in foreign countries by young American geographers. Final reports have been completed for 58 of these projects; 29 reports are in preparation; and 10 studies are still in progress. The Committee on Remote Sensing of Environment reports advances in development of sensor technology for use in study of our physical environment. The Committee on Resources and Man has studied problems facing future human generations, including the exhaustion of fossil fuels.

This brief sampling from recent reports of committees indicates considerable changes in activities during the Division's first fifty years. This review brings conviction that the changes reflect wholesome growth, in our Division and in the Research Council generally. Surely the architects of this organization were endowed with constructive vision.

Postscript of April 2004: At the time this 1968 account of the Division of Earth Sciences was written, the Division still had several more years of operation ahead of it. In 1973, the National Research Council was reorganized, and its discipline-based Divisional structure replaced by a structure containing discipline-based Assemblies and issue- or topic-based Commissions. Accordingly, under the reorganization, the Division of Earth Sciences was placed under the newly-formed Assembly of Mathematical and Physical Sciences, where it remained until the Division name went out of use in 1975-1976. Activities associated with the Division were continued under the auspices of the appropriate Research Council units during that and subsequent reorganizations. The current structure of the National Research Council, which has revived the use of the term "Division" to designate major units, contains a Division on Earth and Life Sciences.

Between 1968 and its discontinuation in 1975, the Division of Earth Sciences continued important work through its study committees. The Committees on Remote Sensing and the Alaska Earthquake, for example, mentioned in Longwell's history, remained in operation. In addition, the Division maintained responsibility for U.S. National Committees—committees for the planning and implementation of U.S. participation in international scientific bodies—in the Earth Sciences, such as geology, geography, geochemistry, tunneling technology, and rock mechanics.

ADMINISTRATION

INTERNATIONAL RELATIONS

- International Unions
    - ICSU (International Council of Scientific Unions): Geodynamics: 1973
- Relationships: UNESCO (United Nations Educational Scientific & Cultural Organization)
    - International Colloquium on Seismic Effects of Reservoir Impounding: 1973

DIVISIONS OF THE NRC

BEHAVIORAL SCIENCES

- Committee on Behavioral & Social Science Survey: Joint with SSRC
    - Panel on Geography: Report (1968): 1966-1970

EARTH SCIENCES

- Annual Conferences
    - Air-Sea Interaction: Apr 1964
    - Computer Utilization in Geology & Geography: May 1963
    - Cartography & Geodesy: May 1962
    - Project VELA UNIFORM: Apr 1961
    - Atomic Energy Commission (AEC) Project Plowshare: May 1959
    - Annual Meetings: Agendas & Minutes: 1957-1972
- Committees
    - Clay Minerals
        - Second Conference on Clay & Clay Materials: 1953
        - General: 1952-1953
    - Geography: Ad hoc
        - End of Program: 1965
        - Meetings: 1962-1964
        - Membership: 1963
        - General: 1962-1966
    - Geography: Advisory to Office of Naval Research
        - Beginning of Program: 1949
        - Conference on Coastal Geographic Information Systems: 1969
        - Coastal Geography Conferences: First & Second: 1954 & 1959
        - Funding: 1953-1963; 1964-1973
        - Meetings: 1953-1963
        - Membership: 1955-1966

        - Panel on Translation of Soviet Geographical Literature: 1958-1959
        - Programs Proposed: 1955-1964
        - Reports: 1957-1973
        - General: 1954-1967
    - Geography
        - Beginning of Program: 1965-1966
        - End of Program: 1971
        - Funding: 1966-1971
        - Meetings: Agendas & Minutes: 1967-1970
        - Membership: 1966-1970
        - Panels
            - Cartography: 1965-1972
            - Medical Geography: 1966-1969
            - Topographical Maps Illustrating Cultural Geography: Proposed: 1970
        - Reports: Geography in Federal Government: 1967-1973
        - Symposia: 1970-1971
        - Working Papers: 1967-1969
        - General: 1966-1971
    - Geological Sciences: Ad hoc
        - Background: Reports: 1967
        - Meetings: Agenda & Minutes: May 1968
        - End of Program: 1972
        - Funding: 1969-1973
        - Meetings: 1970-1972
        - Membership: 1969-1972
        - Reports: Progress: 1970-1971
    - Resources & Man
        - Beginning of Program: 1964-1965
        - Commissioned Papers: Weinberg A: 1967
        - End of Program: 1970
        - Funding: 1966-1968
        - Meetings: Agendas & Minutes: 1966-1967
        - Membership: 1966-1970
        - Reports: 1971
        - General: 1966-1968
    - Rock Mechanics
        - Publications: Tufflavas & Ignimbrites: 1966
    - Seismological Stations
        - Meetings: 1960-1964
        - General: 1960-1964
    - Seismology
        - Background: 1970
        - Meetings: Agendas & Minutes: 1964-1973
        - Panels
            - Earthquake Prediction: 1972-1973
            - San Fernando Earthquake: 1971
            - Seismic Data Distribution: 1973-1974

                - Seismological Instrumentation: 1969-1974
                - Strong-Motion Seismology: 1972-1973
                - World-Wide Standard Seismographic Network: 1965-1970
            - Programs: 1971
            - Reports: 1972-1975
            - General: 1964-1973
        - Terrestrial Resources & Future of Man: 1966
        - Undersea Features: 1961
- Conference on Arctic Sea Ice: Feb 1958
- Executive Committee: Meetings: 1966-1973
- Science & Engineering Committee Advisory to NOAA (Natl Oceanic & Atmos Admin)
- Panel on Earthquake Engineering: 1972
- Symposium on Beneficial Modifications of Marine Environment: Mar 1968
- General: 1961-1973

FINANCE & ACCOUNTING

CONTRACTS

- Army Research Office: DAHC19-73-C-0012
- Atomic Energy Commission (AEC): AT(11-1)-3365

GOVERNMENT

AGENCIES & DEPARTMENTS

- Atomic Energy Commission (AEC): Seismology of Nuclear Testing: 1956-1958

INTERNATIONAL RELATIONS

- NATO (North Atlantic Treaty Organization)
    - Committee on Challenges of Modern Society: 1971