

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

Biography

Arthur Lloyd Howland, son of Arthur Charles Howland, was born in Philadelphia, Pennsylvania on January 13, 1908. His early education was at the Friends Central School and the Pierce Business School in Philadelphia. In 1925 he began undergraduate work in geology at Cornell University. After receiving an A.B. from Cornell in 1929, Howland continued his geological studies at Northwestern University. In 1931, he received an M.A. from Northwestern, and later that year, began work on a PhD at Princeton which was awarded to him in 1933.

On June 3, 1933, Howland was hired as an Instructor in the Department of Geology (later Geological Sciences) at Northwestern. In August 1939, eight months after his marriage on December 15, 1938, to Jean Marian Smith, Howland became an Assistant Professor. In 1942, he was promoted to Associate Professor. In September, 1950, Howland was appointed Professor. Throughout his career, he taught courses in geology, mineralogy, petrography, and petrology on both the undergraduate and graduate levels. Also, he served on various university committees, several of which were concerned with developing the geology department. He served as chairman of the Department of Geology from 1945 to 1969.

In addition to teaching, Howland worked part-time as a geologist for the United States Geological Survey from 1940 to 1954. From 1940 to 1944 while with the Strategic Mineral Deposits Branch, he and other geologists including J.W. Peoples, R.M. Garrels, and W.R. Jones, studied the Stillwater Complex in Montana and its chromite and copper-nickel sulfide deposits in particular. Howland and other civilian geologists in the Military Geology Unit assembled and condensed geological data on various battlefields. He also studied factors relating to the construction of air bases in the Pacific Islands and made surveys of U.S. mineral supplies. In 1945, Howland rejoined the Mineral Deposits Branch where he continued his studies of the Stillwater Complex on a part-time basis until 1954.

Frequently, Howland served as a consultant to various mining companies. Beginning in 1957, he was a regular consultant to the Bear Creek Mining Company in Minneapolis, Minnesota, the Armour Research Foundation, and Harza Engineering Companies in Chicago. Other companies included U.S. Gypsum Company, I.I.T. Research Institute, Molten Metal Engineering Company, and Great Lakes Plating Division. For the Harza Engineering Company and other companies, Howland made petrographic analyses of rocks used in dam foundations for concrete aggregates. He also made maps and surveys in connection with mineral exploration.

Howland was also active in many professional organizations. Sigma Xi, an honorary organization which promotes scientific research, elected him as a member in 1933. In 1957, he became president of the Northwestern University chapter of Sigma Xi. He was a fellow of the Geological Society of America, Mineralogical Society of America, and American Association for the Advancement of Science. From 1956 to 1978, he served on the Board of Scientific Governors of the Chicago Academy of Sciences. He became a member in 1946 and was President in 1947 of the National Association of Geology Teachers. Other

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

professional organizations he belonged to included the Society of Economic Geologists, Illinois Academy of Sciences, and American Geophysical Union.

Howland's primary research interests were connected with his work as a geologist for the U.S. Geological Survey and consultant for various mining companies. Most of his research was in the fields of mineralogy, igneous and metamorphic petrology, and field geology. Some of his work involved mapping and making estimates of potential ore deposits particularly chromite, copper-nickel sulfides, and platinum group metals. Special field research included his studies on Precambrian iron foundations in Newfoundland and Brazil in the summer of 1938. Other research projects led to his study of platinum-bearing sulfide deposits in Montana in 1936 and the structure of Calumet Stock in Colorado in 1937. His interest in copper-nickel deposits in Montana is reflected in his doctoral work at Princeton.

Howland published primarily in the areas of his main research interests in the Stillwater Complex and Society Islands. Topics included chromite deposits of the Stillwater Complex and geology of the Society Islands.

After a distinguished career of 43 years, Howland retired from Northwestern in 1976. He died in Evanston, on November 23, 1978.

Description of the Series

The Arthur Howland Papers comprise 13 boxes including one half-size box. They are arranged in seven major categories: **biographical, correspondence, professional organizations, course-related materials, consulting, research files, and publications**. Course related materials and research files form the bulk of the collection. These two categories reflect Howland's major interests throughout his career. Howland's original arrangement of his papers was largely retained.

The first folder of this series contains **biographical** materials spanning from 1930 through 1978. Included in this material are vitae and newspaper clippings arranged chronologically that illuminate Howland's professional life. The second folder contains Howland's journal from 1936 through 1947. In this journal are personnel and supply lists for the U.S. Geological Survey of the Bureau of the Mines; lists of income Howland earned during 1942-1943 from his work with U.S. Geological Survey; a daily log for 1941 through 1943 summers at Stillwater, Montana; and travel routes for 1936 through 1947 to Colorado, Wyoming, Montana, Pennsylvania, and other places.

Howland's **correspondence**, arranged chronologically in four folders, spans the years 1931 through 1978. It provides an insight into his professional and personal activities and includes letters from his colleagues, teachers, students, and relatives. Of special interest are letters from U.S. Grant, longtime professor of geology at Northwestern. Grant was an instructor

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

and later, a colleague of Howland. The letters from Howland's mother provide a glimpse of his early years, which unfortunately are not well-documented in his papers.

Following Howland's general correspondence, there are six folders of correspondence relating to specific matters. The first contains correspondence pertaining to the Teachers Insurance and Annuity Association. The second contains materials about Howland's work with the Geological Education Orientation Study project that studied the quality of undergraduate education in geology at various colleges in the United States. The third folder includes correspondence and related material concerning Northwestern Mineral Collection (1965 through 1978), and Howland's role as curator of the Collection. In 1968 Howland wrote a grant proposal for the National Science Foundation to support a program of advanced teaching and research in quantitative methods used in the study of geology and analysis of geological problems. The proposal and pertinent correspondence is filed in the National Science Foundation Grant Proposal folder. The last of subject correspondence includes Howland's letters of recommendations from 1969 through 1978 for students and colleagues.

The third category in the papers consists of twelve folders containing material relating to Howland's memberships in **professional organizations**, arranged alphabetically by the name of the organization. Within each folder the material is arranged chronologically. Professional organizations represented include the American Association for the Advancement of Science (1963), American Gem Society (1953-1969), American Geological Institute (1963-1976), American Institute of Professional Geologists (1973-1977), Association of Geology Teachers (1964-1975), Chicago Academy of Sciences (1955-1978), Delta Phi (1936-1940, 1953), Geological Society of America (1946-1974), Mineralogical Society of America (1944-1975), Society of Economic Geologist (1964 and 1972), Sigma XI (1930-1933 and 1969-1978), and the State Microscopical Society (1967). Letters of recommendation supporting Howland's membership, copies of his resumes, correspondence, and material relating to his committee work are contained in these files. The letters of recommendation and resumes provide valuable information about Howland's teaching, research, consulting, and professional affiliations. Also, included are certificates affirming that Howland was accepted as a fellow, honorary or regular member in the various organizations.

Four and one half boxes of **course-related** materials document Howland's teaching career from 1933 through 1976. The material is arranged in three sections; courses held on campus; miscellaneous materials relating to course topics; and field courses. Courses held on campus include general geology, mineralogy, crystallography, and petrology. General reading lists for unidentified courses are grouped together in a folder preceding the numbered courses. The course materials are arranged by course numbers. The material relating to each course is arranged by types of materials: syllabi, reading lists, lectures and notes, laboratory exercises and notes, and examinations. Within each category the material is arranged chronologically. Also included are student papers, doctoral examinations, and related course notes pertaining to the Great Lakes, plate tectonics, and x-ray diffraction. The two folders on field courses contain notes relating to the exploration and analysis of important geological areas in Montana, Wisconsin, and Missouri. Material is arranged by the region where the field work occurred.

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

There are one and a half boxes of correspondence, petrographic analyses, maps, survey work, and bills documenting Howland's **consulting** work. This material is divided into two sections: general correspondence and related materials, and Harza Engineering Company correspondence and related materials. Each section is arranged chronologically. The correspondence and materials from 1953 through 1977 include consulting work for Bear Creek Mining Company, Minneapolis, Minnesota; Rockford Blacktop Construction Company, Loves Park, Illinois; Molten Metal Engineering Company, Hinsdale, Illinois; U.S. Gypsum Company, Chicago; Armour Research Foundation of the Illinois Institute of Technology, Chicago; Anson Mining, New Mexico; and several other firms.

The second section includes Howland's correspondence and related materials documenting his work for Harza Engineering Company from 1957 through 1978. Most of the consulting Howland did concerned petrographic analyses of areas in the United States and South America. The correspondence (1954-1960) between Howland and the Bear Creek Mining Company reveal that he made studies of copper-nickel sulfides in Minnesota and Oklahoma. Correspondence (1957) with the Armour Research Foundation reflects Howland's studies of iron-ores in Brazil. For Harza Engineering Company, Howland made petrographic analyses of rocks found in various areas in North and South America, and the Philippine Islands.

Almost half of the Howland Papers consist of **research files**. Although most of this research material pertains to the Stillwater Complex in Sweet Grass County, Montana, six folders concern other areas of research. The research files are divided into two major sections: Stillwater research and miscellaneous research. The files relating to the Stillwater Complex are divided into correspondence and research materials. The correspondence consists of three sections: general correspondence and correspondence with J. W. Peoples and Everett D. Jackson. Each section of correspondence is arranged chronologically. The general correspondence from 1934 through 1976 includes letters from Harris, Stark, Sampson, Jones, Garrels, Dreyer, and other geologists who worked with Howland at the Stillwater Complex in various branches of the U.S. Geological Survey (1940-1954) and on special research projects. The correspondence from 1933 through 1964 between J. W. Peoples and Howland, concerns the types of field work and research they did together in the Stillwater region particularly their chromite, nickel, and platinum studies. In 1951, E. D. Jackson joined Howland and other geologists for a special U.S. Geological Survey study of chrome deposits at Stillwater, marking the beginning of the correspondence between Jackson and Howland pertaining to special projects at Stillwater.

The research materials for the Stillwater Complex include Howland's U.S. Geological Survey employment forms (1930-1954) and press releases (1940, 1942, 1952). The bulk of the Stillwater research materials are arranged alphabetically by subject. Included are geological maps, detailed analyses of specimens, manuscripts, and miscellaneous field notes from Benbow Hill, Boulder River, Mountain View, Nye Basin, and other areas. Of special interest are the original manuscripts and notes on chromite deposits, igneous and tectonic structures, nickel and platinum group metals, and other topics that formed the basis of articles or major publications by Howland. Howland's Masters' Thesis "The Metamorphic Rocks" (1931-1932) is contained in these files.

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

The second section of the miscellaneous research category contains field notes, note cards, and maps of the structure of Calumet Stock in Colorado, the Society Islands including Raiatea and Borabora; and the Samoan Islands. Many of these notes formed the basis of later articles that appeared in the Proceedings of the Geological Society of America and American Mineralogist. Also included is a Northwestern Masters' Thesis by Thomas Thayer and Arthur Howland about the Geology of Gabenmichigamme Lake written in 1931 under the supervision of U.S. Grant and J. T. Stark. All of the materials in this section are arranged alphabetically by subject.

The last category in the Howland Papers consists of Howland's **publications**. Most are jointly authored by Howland and other geologists. The first folder includes three works about chromite deposits in Sweet Grass County, Montana, while the second folder contains the miscellaneous publications. The works in each folder are arranged chronologically by publication date.

Provenance: Transferred to the Northwestern University Archives by William F. Ramien, Curator of the Geology Department on May 3, 1980 as Accession #80-68.

Restrictions: None.

Separations: 17 linear inches of photographs and negatives were separated to the Archives' photograph files. 5 linear feet of extraneous and duplicative material was discarded.

Processor: Elizabeth Agard, Summer 1981.

Scanned and Reformatted by: Francine Keyes, March 2005.

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

Container List

Box Folder Title, Date

| | | |
|---|----|--|
| 1 | | Biographical |
| | 1 | Biographical Materials |
| | 2 | Journal, 1936-1947 |
| | | Correspondence |
| | 3 | General Correspondence, 1931-1937 |
| | 4 | General Correspondence, 1938-1942 |
| | 5 | General Correspondence, 1943-1969 |
| | 6 | General Correspondence, 1970-1978 |
| | 7 | Teachers Insurance and Annuity Association 1944-45, 1972, 1976 |
| | 8 | GEO-STUDY, 1962-1963 |
| | 9 | Mineral Collection, 1965-1978 |
| | 10 | National Sciences Foundation Grant Proposal, 1967-1971 |
| | 11 | Recommendations, 1969-1978 |
| | | Professional Organizations |
| | 12 | American Association for the Advancement of Sciences, 1963 |
| | 13 | American Gem Society, 1953-1969 |
| 2 | 1 | American Geological Institute, 1963-1976 |
| | 2 | American Institute of Professional Geologists, 1973-1977 |
| | 3 | Association of Geology Teachers, 1964-1975 |
| | 4 | Chicago Academy of Sciences, 1955-1978 |
| | 5 | Delta Phi, 1936-37, 1939, 1940, 1953 |
| | 6 | Geological Society of America, 1946-1974 |
| | 7 | Mineralogical Society of America, 1944-1975 |
| | 8 | Sigma Xi, 1930, 1933, 1969, 1970, 1974 |
| | 9 | Society of Economic Geologists, 1964, 1972 |
| | 10 | State Microscopical Society, 1967 |
| | | Course-related Materials |
| | 11 | Reading Lists |
| | 12 | Geology A03, Earth Resources, 1972-1975 |
| | 13 | Exams |
| | 14 | Geology A10-1, Mineralogy, 1960-1962, 1964, 1966 |
| 3 | 1 | Geology A10-2, Mineralogy, 1960-1961, 1964, 1966 |
| | 2 | Geology A10-3, Mineralogy, 1960-1962, 1964-1965 |
| | 3 | Geology A10, Mineralogy, Summer Sessions, 1946, 1961-1966 |

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

Container List

| <u>Box</u> | <u>Folder</u> | <u>Title, Date</u> |
|-------------------|----------------------|---|
| | 4 | Geology B-3, Mineralogy |
| | 5 | Geology B-7, Mineralogy, 1951-1955 |
| | 6 | Geology B-12, Mineralogy, 1956-1957, 1959-1960 |
| | 7 | Geology B-13, Mineralogy, 1956 |
| | 8 | Geology B-20, Mineralogy, 1970 |
| | 9 | Geology C01-2, Crystallography, 1961-1969, 1973, 1975 |
| | 10 | Geology C01-2, Chemical Classification and Systematics |
| | 11 | Geology C01-2, Crystallography |
| | 12 | Geology C01-3, Crystallography, 1967, 1969 |
| | 13 | Geology C02, Chemistry and mineralogy of Natural Systems I, 1964, 1974-1976 |
| | 14 | Geology C03, Chemistry and Mineralogy of Natural Systems II, 1974 |
| 4 | 1 | Geology C04, Earth Dynamics, 1973-1975 |
| | 2 | Geology C05, Earth History, 1974-1975 |
| | 3 | Geology C-2, Geologic Principles and Processes II, 1948 |
| | 4 | Geology C-15, Mineralogy, 1947, 1953-1958 |
| | 5 | Geology C-17, Crystallization, 1945, 1947, 1952-1954 |
| | 6 | Geology C-20, Mineralogy, 1967, 1971-1972 |
| | 7 | Geology C-70, Chemical Behavior of Geological Systems |
| | 8 | Geology C-80, Evolution of Intelligence |
| | 9 | Geology D-1, Metamorphism, 1948-1955 |
| | 10 | Geology D-6 Metamorphism, 1937-1938, 1949-1950 |
| | 11 | Geology D-11 Metamorphism, 1939-1942, 1946-1953 |
| | 12 | Geology D-15, 1955 |
| | 13 | Geology D-24 Petrology, 1955-1976 |
| 5 | 1 | Geology D-24, Petrology |
| | 2 | Geology D-24, Petrology |
| | 3 | Geology D-24, Petrology, Classification, Properties |
| | 4 | Geology D-25, Petrology and Petrography, 1956-1967 |
| | 5 | Geology D-26, Petrology, 1959, 1966-1968, 1971 |
| | 6 | Geology D-33, Geochemistry, 1964-1967 |
| | 7 | Geology D-35 Paleontology, 1956, 1964, 1968 |
| | 8 | Geology D-38, Geochromology |
| | 9 | Chemical Geology |
| 6 | 1 | Doctoral Examination, 1961 |
| | 2 | Great Lakes, 1973-1977 |
| | 3 | Hemingway Notes on Stratigraphy and Sedimentation |
| | 4 | Plate Tectonics, 1971 |

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

Container List

Box Folder Title, Date

| | | |
|----|----|---|
| | 5 | Student Papers, 1966, 1972 |
| | 6 | X-ray Diffraction |
| | 7 | Winchell's Geological Notes |
| | 8 | Field Courses: Minnesota and Wisconsin |
| | 9 | Missouri |
| | | Consulting |
| | 10 | General Correspondence and Related Materials, 1953-1956 |
| | 11 | General Correspondence and Related Materials, 1957 |
| | 12 | General Correspondence and Related Materials, 1958-1959 |
| 7 | 1 | General Correspondence and Related Materials, 1960-1962, 1969 |
| | 2 | General Correspondence and Related Materials, 1970-1977 |
| | 3 | Harza Engineering Company Correspondence, 1957, 1960-1963 |
| | 4 | Harza Engineering Company Correspondence, 1964-1968, 1971 |
| | 5 | Harza Engineering Company Correspondence, 1972-1974 |
| | 6 | Harza Engineering Company Correspondence, 1975-1976 |
| 8 | 1 | Harza Engineering Company Correspondence, 1977-1978 |
| | | Research Files |
| | 2 | Stillwater: General Correspondence, 1934, 1939-1958 |
| | 3 | J. W. Peoples Correspondence, 1933-1940 |
| | 4 | J. W. Peoples Correspondence, 1941-1942 |
| | 5 | J. W. Peoples Correspondence, 1943-1949 |
| | 6 | J. W. Peoples Correspondence, 1950-1954 |
| 9 | 1 | Stillwater: J. W. Peoples Correspondence, 1955-1962, 1964 |
| | 2 | Stillwater: E.D. Jackson Correspondence, 1951-1957, 1964, 1967-1968 |
| | 3 | Stillwater: U.S. Geological Survey Employment Forms, 1930-1954 |
| | 4 | Stillwater: Press Releases, 1940, 1942, 1952 |
| | 5 | Benbow Hill Notes |
| | 6 | Boulder River Notes and Maps |
| | 7 | Chromite Deposits Central Part Notes |
| | 8 | Chromite North Eastern Part |
| 10 | 1 | Stillwater: Chromite Deposits of the Stillwater Complex, Stillwater and Sweetgrass Counties, Montana by Peoples, Howland, Jones |
| | 2 | Stillwater: Chromite Assays and Specimens |
| | 3 | Geochemical Investigation by E.D. Jackson |

Arthur Howland (1908-1978) Papers, 1930-1978

Series 11/3/14/3

Boxes 1-13 (Including one half-size box)

Container List

| <u>Box</u> | <u>Folder</u> | <u>Title, Date</u> |
|-------------------|----------------------|---|
| | 4 | Igneous and Tectonic Structures |
| | 5 | Lists of Maps and Maps |
| | 6 | Maps |
| | 7 | Masters' Thesis, "The Metamorphic Rocks" and Expenses (1931-1932) |
| | 8 | Stillwater: Metamorphism and Tonnage Notes |
| 11 | 1 | Stillwater: Mountain View Area Notes |
| | 2 | Mountain View Area Maps |
| | 3 | Nickel, Copper, Sulfide Notes |
| | 4 | Nickel Assays |
| | 5 | Stillwater: Nye Basin |
| | 6 | Notes on Specimens by Peoples, Howland, and Jackson |
| | 7 | Stillwater: Stratigraphic Sections and Minerals |
| | 8 | Stillwater: Triangulation |
| | 9 | Stillwater: West Fork |
| 12 | 1 | Miscellaneous Research: Borabora Field Notes |
| | 2 | Calumet Notes and Maps |
| | 3 | Raiatea Island Notes |
| | 4 | Society Islands |
| | 5 | Notes |
| | 6 | Masters' Thesis: Geology of Gabenmichigamme Lake, 1931 |
| | | Publications |
| | 7 | Chromite Deposit Publications |
| 13 | 1 | Miscellaneous Publications. |