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MINNESOTA GEOLOGICAL SURVEY priscilla c. grew, director

BULLETIN 47

BIBLIOGRAPHY OF MINNESOTA GEOLOGY 1981-1985

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PREFACE

This bibliography contains references to the geologic literature on the State of Minnesota issued from 1981 through 1985, as well as omissions from the previous two bibliographies of Minnesota geology: Bulletin 34 (published in 1951), with coverage through 1950; and Bulletin 46 (published in 1981), with coverage for 1951-1980.

The references in the bibliography section cover most geologic topics but exclude those confined to the last 10,000 years, to surface hydrology, and to mining and metallurgy. Most unpublished maps and reports were excluded from this bibliography, because they are not readily available to users. Notable exceptions are theses and dissertations and open-file reports issued in established and accessible series, such as the U.S. Geological Survey's Open-File Report series. An effort was made in the bibliography section to preserve the spelling, capitalization, and punctuation of the original sources; usage in the index reflects current Minnesota Geological Survey style.

The last bibliography, Bulletin 46, covered 30 years. Bulletin 47 covers only 5 years, but contains nearly 1,100 references, more than half the number in its predecessor. Much of this inflation may reflect the increased number of abstracts published in recent years. The next bibliography (for 1986-1990) will differentiate between abstracts and more substantive work.

The index section, with a few minor changes, closely follows the design of the index in Bulletin 46. It has in one alphabetical listing topical (Ground Water; Petrology; Sedimentation), geographic (Mesabi range; Lake County; Southwestern Minnesota), lithostratigraphic (Duluth Complex; Lake Vermilion Formation), and chronostratigraphic (Paleozoic; Quaternary) indexing. Care was taken to index references to the closest applicable index classifications. For this reason, users of the index are encouraged to search flexibly, to check both broader and narrower index classifications. For example, someone wanting references for Aitkin County may also wish to search a narrower index classification— Cuyuna range, as well as the broader East-central Minnesota. The increased number of cross references in this index should help users with this type of search.

Several of the Survey staff were especially helpful in the preparation of the index, and also reviewed the entries in their respective fields: M.J.P. Kuhns and S.J. Mills (economic geology and Duluth Complex); P.L. McSwiggen (petrology and uranium); H.C. Hobbs (glacial geology); and D.J. Bergstrom (Paleozoic rocks and Sioux Quartzite). V.W. Chandler reviewed the geophysics entries; D.R. Setterholm, Cretaceous rocks; R.S. Lively, geochemistry and geochronology; and M.C. Hoyer, ATES. Linda McDonald typed and updated the bibliography through most of its existence. Denise Fletcher typed the index and inserted the typesetting codes. J.F. Splettstoesser proofread the final typescript. Type was set from the word-processor disks, under the direction of Hazel White at the University of Minnesota Printing Department.

The compilers hope that any errors or omissions discovered by users of the bibliography will be brought to our attention.



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Sulfides. See Duluth Complex: Economic geology. Superior Province. See Canadian Shield. Surficial geology. See Geomorphology; Glacial geology; Quaternary; geographic areas by name. Taconite. See Economic geology; Iron-formations. Tectonics. See also Great Lakes tectonic zone; Midcontinent rift system: Penokean orogeny. Archean terrane boundaries: Gibbs, 1-2. Colorado Lineament. See Great Lakes tectonic zone. Crustal structure, Lake Superior: Berry. Effect on composition of layered intrusions: Weiblen, 5. Glacial and postglacial history, Lake Superior: Wold, 2. --Postglacial uplift: Dutch, 2; Saarnisto. Implications of Keweenawan paleomagnetism: Van der Voo; Watts, D.R. Lake Superior region: Baragar; Dutch, 1-4; Sims, 6, 9; Wold, 1; Young, G.M. North America map: King, P.B., 2. Paleozoic, central U.S.: Ham. Plate tectonics. -Interpretations, Keweenawan rifting: Anderson, S.L. -Model, evolution of Animikie basin: Morey, 9. Post-Cretaceous: Dutch, 2, 4. Precambrian: Bagdadi, 1-2; Van Schmus, 1-7. -Cambrian-Precambrian contact relationships: Scott. -Wrench fault: Dutch, 1. Pre-Keweenawan history: Klasner. Proterozoic: Young, G.M. -Plate tectonics: Baragar. -Proposed continental margin, east-central Minnesota: Spencer, 1-2. Relation of seismicity to tectonics: Mooney, 2. Regional isostatic relations: Woollard. Role of rifting, regional tectonic development: Keller, G.R. Southern Province, Canadian Shield: Card. Transcontinental Arch: Bunker, 1. Vertical crustal movement, last 10 million years: Gable. Theoretical petrology. See Petrology, theoretical. Thermometry. See Petrology, metamorphic, barometry and thermometry. Thomson Formation (Early Proterozoic). Deformation and structure: Clark, R.C., 1-2; Connolly; Holst, I-2, 5-6, 8-9, 11-13; Hyrkas; Weijermas. Denham area, areal geology: Neumann. Petrology: Clark, R.C., 2; Connolly; Hyrkas; Labotka, 3. Sedimentary structures: Clark, R.C., 2. Sedimentology: Hyrkas. Structural modeling: Clark, R.C., 1. Uranium in phosphates: McSwiggen, 1-3; Ullmer, 1.

Tiger Boy. See Duluth Complex, mineral prospects. Till. See Glacial geology. Titanium. See Economic geology. Todd County. Ground water: Myette, 2. Topographic lineaments. See Lineaments. Trace element geochemistry. See Geochemical investigations. Transmission electron microscopy. See Electron microscopy, transmission. Traverse County. Cretaceous microfossils: Holzheimer. Trilobites. See Paleontology. Trommald Formation (Early Proterozoic). Manganese: Morey, 6. Tunneling and underground space. See Engineering geology, Twin Cities; Seasonal thermal energy storage (STES). Tuscarora intrusion. See Duluth Complex, intrusions Twin Cities Metropolitan Area. See also counties by name; St. Louis Park creosote plant site. Aggregate resources: Meyer, G.N., 5; Rajaram; Schenk. Bedrock valley influence on the Mississippi River: Jirsa, 2. Drift-filled bedrock valley: Woodward, 3. Engineering geology: Bloomgren; Minnesota, University, Underground Space Center; Sterling; Stone, J.E., 1; Walton, 4, 9. Ground-water flow system: Guswa; Schoenberg, 3-4 Ground-water resources: Horn, 1-2. Hazardous waste disposal site, Rosemount: Labno. Lake-, ground-water interaction, Minneapolis Chain of Lakes: Ferguson; Goudreault; Trotman. Maps. -Bedrock geology and topography: Bloomgren. -Quaternary geology: Meyer, G.N., 3. 1965 status of geologic studies: Stone, J.E., 1. Ordovician paleontology: Brower, 1-2; Rice, W.F., 2. St. Paul ATES project: Blair, 1-6; Hoyer, 1-3; Kanivetsky, 6; Kannberg; Lee, H.C.; Miller, R.T., 3-8; Minnesota, University; Mitchell, P.J.; Smith, A.J.; U.S. Geological Survey, 15; Walton, 1-3, 5, 7-8. St. Paul Coke Plant, seismic refraction study: Woodward, 3. St. Paul Energy Park: Walton, 9. Subsurface data collection: Walton, 4. Teacher's guide: Stone, J.E., 2. Tunneling and underground space: Minnesota, University, Underground Space Center; Nelson; Sterling. Twin Cities Army Ammunition Plant, seismic refraction study: Woodward, 3.

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Underground space. See Engineering geology, Twin Cities; Seasonal thermal energy storage (STES).

United States, maps. See Minnesota, Maps.

Upper Mississippi River valley. See Mississippi River valley.

Uranium.

- Exploration geochemistry: Delaney; Morey, 23; Oak Ridge, 1-5; Routledge; Southwick, 8; Texas Instruments, 1-2.
- Exploration radiometric and magnetic surveys and maps: Aero Service Division, 1-11; Bendix, 1-25; Delaney; geoMetrics, 1-4; Routledge; Texas Instruments, 1.

Favorable environments: Morey, 23; Southwick, 8.

- Phosphates, Thomson Formation: McSwiggen, 1-3; Ullmer, 1.
- Pine County: Neumann.

Potential in relation to geologic terranes: Morey, 2. Sioux Quartzite: Cheney; Southwick, 7.

- Solution-mineral equilibria: Shettel.
- Unconformity-related uranium deposits: Cheney; Shettel; Ullmer, 1.

Vermilion district. See also Ely Greenstone; Giants Range batholith/Granite; Knife Lake Group; Lake Vermilion Formation; Saganaga batholith/Granite/ Tonalite; Soudan Iron Formation; Vermilion Granitic Complex; Vermilion iron range.

Archean.

- -Basalts: Schulz, K.J., 3.
- -Bedrock geologic maps: Sims, 3, 10.
- -Crustal composition: McLennan, 1-2.
- -Deformation: Bauer, 1-8; Hudleston.
- -Geochemistry: Grimes; Jahn, 1; McLennan, 1-2; Schulz, K.J., 1, 3; Shirey.
- -Geochronology: Jahn, 2.
- -Jap Lake area: Vervoort.
- -Petrology: Schulz, K.J., 1, 3; Shirey.
- -Sedimentology: Ojakangas, 6.
- -Structure: Bauer, 1-8; Ela.
- Bedrock geologic maps: Sims, 3, 10.

Graywackes: McLennan, 1-2; Ojakangas, 6. Soil geochemistry: Grimes.

Vermilion Granitic Complex (Archean). See also Vermilion district.

Alkalic and silicic plutons: McCall.

- Crustal evolution: McCall.
- Geochemistry: Day, 1-2; McCall; Sheehan.

Norwegian Bay quadrangle: Bauer, 5.

- Partial melting: Sheehan.
- Petrology, igneous: Day, 1-3, 8-9; Mariano.
- Petrology, metamorphic: Bauer, 1-3; Day, 3, 10; Mariano.
- Structure: Bauer, 1-8; Kaszuba.
- Wakemup Bay stock: Bauer, 1, 5.
- Vermilion iron range.
- Tower-Soudan mine tour: Olsen, D.K.
- Virginia-Biwabik area. See St. Louis County.

Virginia Formation (Early Proterozoic). Contact metamorphism: Kirstein; White, C.E., 1-2. Geochemistry: White, C.E., 1-2. Origin of graphite: Douthitt. Stratigraphy and sedimentology: Lucente. Wabasha County. See also Mississippi River valley. Caves and karst: Alexander, 5. Wadena County. Ground water and water quality: Myette, 1, 3. Wapsipinicon Formation. See Devonian rocks. Washington County. See also Mississippi River valley; St. Croix River valley; Twin Cities Metropolitan Area. Big Marine Lake, lake-level fluctuations: Brown, R.G., 2. Ground-water modeling: Fitts, 1-2. Lake St. Croix sediment paleomagnetic record: King, J.W., 1; Lund, 1-7. Waste disposal. See Hazardous waste disposal; Pollution; Radioactive waste disposal, high-level wastes. Watab Amphibolite. See Metadiabase near Watab. Water Hen intrusion. See Duluth Complex, intrusions. Water quality. See also Pollution. Cretaceous aquifers: Anderson, H.W., Jr. East-central Minnesota: Lindholm; Myette, 1, 3. Minnesota: Adolphson, 2; Bruemmer, 2; Winter, 1. Northeastern Minnesota: Siegel, 1-3, 6-7, 12. Southeastern Minnesota: Bruemmer, 1; Ruhl, 1-3; St. Ores; Singer; Wolf, R.J., 2. Southwestern Minnesota: Adolphson, 1. Twin Cities area: Labno. West-central Minnesota: Lindholm; Miller, R.T., 1-2; Myette, 1, 3; Soukup. Water resources. See also Ground water. Cretaceous aquifers: Anderson, H.W., Jr. East-central Minnesota: Lindholm. Minnesota: Adolphson, 2; Bruemmer, 2; Minnesota Department of Natural Resources, Division of Waters: Woodward, 2. Southeastern Minnesota: Woodward, 4. Southwestern Minnesota: Adolphson, 1. Twin Cities area: Horn, 1-2. West-central Minnesota: Lindholm; Soukup. Weathering. Feldspars in Paleozoic sandstones: Basu. Silicate minerals in gabbroic watershed: Siegel, 2-3, 7.12. Wells and well-logging. See also Drilling and boreholes. Feasibility of barrier well system, St. Louis Park creosote plant site: Hickok. Municipal well installation and utilization, southeastern Minnesota: Woodward, 4. Well construction in karst terrain: Little, 2; Olsen, B.M., 5.

West-central Minnesota. See also counties and specific rock units by name.

Agate collecting: Hockett.

Calcareous peatlands: Malterer, 2-3.

Classification, Holocene lake sediments: Anderson, R.Y.

Geophysical investigations.

- -Aerial radiometric surveys and maps: Aero Service Division, 2; Bendix, 3, 7, 19; Texas Instruments, 1.
- --Aeromagnetic surveys and anomaly maps: Aero Service Division, 2; Bendix, 3, 7, 19; Chandler, 12.
- —Seismic source zone: Krinitzsky.
- Glacial geology.
- -St. Croix moraine, Swanville area: Hobbs, 3.
- -Till block inclusions: Cowdery.
- ---Wadena drumlin field: Baranowski; Goldstein, 1-2; Mills, H.H.
- -Wadena till: Meyer, G.N., 4.

Ground water: Soukup.

- -Buffalo aquifer: Wolf, R.J., 1.
- Pelican River sand-plain aquifer: Miller, R.T., 1-2.
- —And stream-sediment geochemical surveys: Morey, 23; Oak Ridge, 1; Texas Instruments, 1.
- Land-use and land-cover maps: U.S. Geological Survey, 5, 11.
- Lower (Early) Proterozoic batholith: Ronnei.

Stromatolites/stromatoloids: Hosch; Soroka, 1-3. Teacher's guide: Hoagberg, 1.

Water quality and resources: Lindholm; Miller, R.T., 1-2; Myette, 1, 3; Soukup.

Williams Lake. See Hubbard County.

Willow River Dolomite Member. See Prairie du

- Chien Group, Shakopee Formation.
- Windrow Formation. See Cretaceous rocks.
- Winona County. See also Mississippi River valley. Aggregate resources: Jirsa, 3. Bedrock geology: Mossler, 4. Bedrock hydrogeology: Kanivetsky, 4.
 - Caves, karst, and sinkholes: Alexander, 1, 6-7, 9, 11; Book; Dalgleish, 1-3.
 - Dye tracing, ground-water flow: Book.
 - Geologic atlas: Balaban, 2; Dalgleish, 3; Hobbs, 4; Jirsa, 3; Kanivetsky, 4-5; Mossler, 4; Olsen, B.M., 4-5.

Surficial geology: Hobbs, 4, 6.

- Wisconsinan. See Glacial geology; Quaternary.
- Wolf Creek. See Morrison County.

Wright County. See also Mississippi River valley. Sand-plain aquifers: Lindholm.

- X-ray analysis.
 - Hornfels, Partridge River troctolite (intrusion): Chalokwu, 6.
 - North Shore Volcanic Group: Brannon, 1-3.

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