

Current Research

Book Review: Coastal Environments of Northeastern Massachusetts and New Hampshire by the Coastal Research Group, Geology Department, University of Massachusetts, Amherst, Mass.

This book is a field trip guidebook published in 1969 in pleasing large bold type, and is heavily supported by an edifying array of maps, line sketches and photographs. As well as being a guidebook, it is a first rate field manual on coastal processes. Rivers, estuaries, beaches, nearby islands and associated bars and spits are described with photographs and graphic illustrations to demonstrate the natural phenomena occurring in these areas. Discussions on the inter-relationship of local meteorology, hydrography, storm conditions and sediment transport are also given. Sea level fluctuations are discussed, along with river discharge, movement of dunes, wind velocities, sedimentary textural studies, tide levels, wave heights and many other factors.

At each stop, a lecture is given that is directly related to coastal processes that are under the visitor's scrutiny. The supporting documentation makes this book a true field manual. Sampling techniques are also described, as well as some laboratory techniques generally followed later. At some stops, environments are discussed, at others it may be erosion, transportation of sediments, vertical profiles, cores, structures, trenching, sediment texture, beach forms, depositional features, currents, organisms, bar development, salinities, soils, drumlins, petrography and source material, ripple development and movement, dunes, salt marshes and their flora, ice-rafting, beach faces, berms, beach conservation, tidal channels, bedforms, deltas, intertidal and subtidal features, sand bodies, swash bars, crossbedding, paleocurrent indicators, Holocene stratigraphy, and seasonal variations of water discharge and its effects on sedimentation.

The third portion of the book consists of short contributions on the above subjects, and the following list will provide an idea of their scope.

Hydrography of the Merrimack River Estuary, Massachusetts - Allan D. Hartwell and Miles O. Hayes
 Storms as Modifying Agents in the Coastal Environment - Miles O. Hayes and Jon C. Boothroyd
 Grain-size Parameters of the Beach and Dune Sands, Northeastern Massachusetts and New Hampshire Coasts - Fayez S. Anan
 Offshore Bars at Plum Island, Massachusetts - Victor Goldsmith
 Sediment Dispersal Trends in the Littoral Zone; A Problem in Paleogeographic Reconstruction - Miles O. Hayes, Fayez S. Anan, Robert N. Bozeman
 Growth Cycle of a Small Recurved Spit, Plum Island, Massachusetts - Steward C. Farrell
 Holocene Sediments of the Parker River Estuary, Massachusetts - Joan M. DaBoll
 Eolian Sand Transport on Plum Island, Massachusetts - Frederick D. Larsen
 Holocene Stratigraphy of the Marshes at Plum Island, Massachusetts - C. Larry McCormick
 Post-storm Profile and Particle-Size Changes of a New Hampshire Gravel Beach: A Preliminary Report - Barry S. Timson
 Sedimentary Mineralogy of the Hampton Harbor Estuary, New Hampshire and Massachusetts - Sharon A. Greer
 Diagnostic Primary Structures of Estuarine Sand Bodies (Abstract) - Miles O. Hayes, Jon C. Boothroyd, Albert C. Hine.
 Forms of Sand Accumulation in Estuaries (Abstract) - Miles O. Hayes
 Hydraulic Conditions Controlling the Formation of Estuarine Bed Forms - Jon C. Boothroyd
 Holocene Stratigraphy of the Marshes of the Merrimack River Estuary, Massachusetts - Allan D. Hartwell

An illustrated glossary of terms and structures is also included. Altogether this publication is a suitable manual for student and professional alike and its nearly 500 pages of first hand source material more than justifies the nominal five dollar cost of the book. For further information, contact Professor M.O. Hayes - Editor, Department of Geology, University of Massachusetts, Amherst, Mass.

B.R. Pelletier

Now Available from the New Publication Series of the Department of Geology, The University of Massachusetts.

Contribution No. 1 - CRG: Coastal Environments; NE Massachusetts and New Hampshire: Guidebook - Field Trip for Eastern Section, S.E.P.M. - May 9-11, 1969; 239 text figs., 462p. By Coastal Research Group (M.O. Hayes - Editor) Price - \$5.00. Contribution No. 2: Sedimentary History of Upper Triassic Alluvial Fan Complexes in North-Central Massachusetts: 53 text figs., 157 p. By James M. Wessel, Price - \$3.75. Contribution No. 3 - CRG: Holocene Sediments of the Parker River Estuary, Massachusetts: 42 text figs., 138 p. By Joan M. DaBoll, Price - \$3.00.

For purchase of these publications, make cheques payable to "The University of Massachusetts" and mail to:
 Publication Committee,
 Dept. of Geology, Morrill Science Center,
 University of Massachusetts,
 Amherst, Massachusetts 01002, U.S.A.

Book Review: Sedimente und Sedimentgesteine by H. Fuchtbauer and G. Müller, E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 1970, 726 p. Reviewed by Gerard V. Middleton, McMaster University, Hamilton, Ontario.

This is a monumental work, crafted in the grand tradition of German scholarship. It forms Part II of a projected three part work on sedimentary petrology. Part I, on methods by G. Müller, has already appeared in both German and English versions. Part III will be mainly concerned with processes of formation of sediments and sedimentary rocks, and will be written by W. von Englehardt. Part II is concerned mainly with the sediments and rocks themselves. It is heavy on description and classification, but cannot, of course, avoid some discussion of processes too. It is, if you like, a German version of Pettijohn's famous book. If you are willing to wait a year or two, you will be able to have it in an English version, but if you are impatient or are looking for some way to brush up your old language-exam German before the International Sedimentology Congress in Heidelberg next year, let me recommend the (rather large) investment in this new volume by Fuchtbauer and Müller.

The book is an amazing mine of information: citations alone occupy more than 70 pages. After a brief introduction ("the exogenic cycle" and "principles of nomenclature") the authors get down to business with chapters on (3) Sandstones, conglomerates and breccias, (4) Silt- and claystones, (5) Carbonates, (6) Special Sediments, "Sedimente spezieller Bildungsbereiche", which includes Evaporites, Cherts, Phosphates, Iron- and Manganese-Rich Sediments, Ores in Sedimentary Rocks (only one and a half pages), Residual Rocks, Pyroclastics, Coal, and (right up to date!) Sediments of the Moon. There is a final chapter on Rhythmic Sedimentation.

The book shows a strong mineralogical bent. The Sandstones chapter, for example, includes 35 pages on "primary components", followed by 19 pages on textures, 24 pages on structures, and 14 pages on "sand bodies" (geometry and facies relationships, including tectonic control). There are then 24 pages on diagenesis of sandstones. The chapter on silts and clays is a long one (145 pages). It is written by Müller and includes most of the material in his review of diagenesis of argillaceous rocks, published in the recent Elsevier book "Diagenesis in Sediments", but much else besides. It would be difficult to find in English a comparably thorough treatment of fine grained sedimentary rocks, treated from a geological rather than a clay-mineralogical point of view. Carbonates is another long chapter, by Fuchtbauer. First he describes "the primary types": lime mud, granular limestone, pellets, detritus, fossils (with 37 pages of description of the main types of fossil fragments), ooliths, crusts, biostromes, and bioherms. There is a long section (49 pages) on diagenesis, followed by shorter sections on porosity and environments.

The book is abundantly illustrated with well chosen and redrafted line drawings and with excellent photographs of textures and structures. It seems to me that the book makes a fine complement to much recently published North American work, with the latter's emphasis on sedimentary structures, and facies analysis of both recent and ancient sediments. Probably some sedimentologists are growing up outside the classical tradition of mineralogical and geochemical investigation of sedimentary rocks. This book will be able to show them all the good things they are missing. Unfortunately the price is high (120DM, about \$36) but for once there is a high return in information per dollar expended.

Book Review: An Introduction to Sediment Analysis by Chester F. Royse, Jr.

A long overdue laboratory manual for courses in sedimentology, sedimentary rocks and sedimentary petrography is now available. This 150-page text contains analytical procedures in both physical and chemical sedimentology which should be of interest to advanced students as well as the beginner. Included in the 15 "Units" of the manual are detailed procedures for sieve, pipette and hydrometer analyses; heavy mineral separation; roundness and sphericity measurement; X-ray analysis of fine-grained sediments; determination of total reactive carbonate and organic carbon; calcite-dolomite ratios in sedimentary rocks; resolution of directional data; and other fundamental sedimentologic routines. The approach is intended specifically for an introductory course and detailed attention is given to particle-size scales, descriptive measures of size distributions and to the presentation and interpretation of sediment-size data. Each Unit contains an Introduction, list of Equipment, Procedure, Discussion and References. Most Units contain a set of Exercises based upon the topic of that chapter. Although the treatment is far from exhaustive, a specific attempt has been made to select laboratory routines that are good examples of procedures central to the discipline of sedimentology. In addition, the selected analyses require only modest equipment common to most laboratories. It is hoped that such procedures will be particularly appealing to small geology departments with modest resources. In keeping with this format, supplementary data are appended which will permit completion of Procedures and Exercises without going through all analytical routines. For example, the X-ray analysis exercise can be completed using the appended diffractograms and tables; a class need not have access to a diffraction unit.

An Introduction to Sediment Analysis contains detailed Discussions and References which should benefit advanced students. Although the analyses outlined are relatively simple, each has proven useful for routine investigation. The discussions should provide a good foundation for more sophisticated considerations and the references should aid in pursuing specific objectives.

SEDIMENT ANALYSIS, 1046 Bluebell Lane, Tempe, Arizona 85281, U.S.A.

University of Ottawa, Ottawa, Ontario compiled by O.A. Dixon.

In the Department of Geology, D.S. Cronan and two M.Sc. students, A. Sozanski and S.M. Parnandi are conducting research projects on the geochemistry of marine and lacustrine sediments. These include investigations on the geochemistry of manganese nodules and other ferromanganese deposits from, respectively, the Atlantic Ocean, the Great Lakes and small lakes in Ontario. In addition, studies are being conducted on the trace element geochemistry of North Atlantic sediments, and on the regional geochemistry of Pacific pelagic sediments.

The department's continuing research program in the central Canadian Arctic now involves studies on the Aston, Hunting, Allen Bay and Read Bay Formations (?Precambrian to Silurian) on Somerset and Prince of Wales Islands, directed by O.A. Dixon. Two Ph.D. students, S.R. Williams and James Dixon are conducting faunal-ecological-sedimentological-stratigraphic studies of the Silurian Read Bay Formation and the (?) Middle Ordovician to Lower Silurian Allen Bay Formation, respectively. Particular objectives include the refinement of the ages of the formations, the definition of formational boundaries and their regional character, and the interpretation of sedimentary environments in the Boothia Arch region during Lower Paleozoic time. On Prince of Wales Island, newly recognized outcrops of a thick, basal sedimentary sequence, the Aston Formation, are being studied. They confirm the existence of the Boothia Arch as a positive topographic feature in Aston time. Work is continuing on the age of this problematic late Precambrian or early Paleozoic formation, and the Hunting Formation which locally lies between it and fossiliferous Allen Bay carbonates. In addition, O.A. Dixon is conducting faunal-paleo-ecological studies on the marine Ordovician-Silurian sequence on Anticosti Island.

W.K. Fyson is continuing structural studies of metamorphic rocks in northern Cape Breton Island. In the same area, R. Weibe (Franklin and Marshall College, Pennsylvania) is working on problems of igneous petrology.

Memorial University of Newfoundland, Project "Habitat" by Dr. R.T. Dempster, Asst. Prof. of Engineering, Memorial University of Newfoundland.

The Memorial University undersea habitat is one of several projects in a program of ocean engineering being developed by the Faculty of Engineering and Applied Science. The habitat, when completed, will offer a facility unique in Canada for carrying out engineering research related to the oceans. It will be unique in the sense that the ocean environment in the vicinity of St. John's, is sub-arctic, whereas previous experiments with undersea habitats have taken place in tropical and subtropical waters.

With such a laboratory, it will be possible for Canadian scientists to test equipment, carry out research and develop engineering procedures relevant to the Arctic, before they proceed to the harsh and difficult conditions in the field.

The habitat shell consists of a horizontal cylinder approximately eight feet in diameter (Fig.1) and sixteen feet long. This will be divided into two sections, one a resting area and the other a working section. The working section has two - thirty inch diameter plastic observation domes. Facilities in the resting area consist of two bunks, a sink, electric cooker, television set, collapsible dining table and a small chemical toilet. These will allow two aquanauts to remain in the habitat for extended periods of time. A shore-based support station will supply air, electricity and drinking water to the habitat (Fig. 2).

Previous habitat program from the U.S. Navy SEALAB to TEKTITE, jointly sponsored by the U.S. Navy, NASA and the United States Department of the Interior have contributed valuable information on human and equipment performance in the sea. The cost of these multi-million dollar programs are, in a sense, a measure of their importance to the United States Government. The Memorial University project represents a modest Canadian venture into this new and rapidly developing field of technology.

Physical Data of Habitat:

Pressure Vessel - 8 feet diameter, 16 feet long, capable of housing 2 men at 35 feet depths for up to two weeks.
 Ocean Environment - Temperature below 5°C for 6 months of the year and below 1°C for three months of the year.
 Habitat Environment - 75°F to 80°F and 60% to 70% relative humidity.
 Power Supply - Diesel - Generator 40 KW, 50 KVA single and three phase rating 60 cycle, 1,800 r.p.m.

Power Breakdown:

	<u>Watts</u>	<u>Volts</u>	<u>Phase</u>
Heaters	4,000	208	2
Lighting Exterior	1,200	115	single
Lighting Interior	600	115	single
Berth Lights	120	115	single
Rangette	2,000	115	single
Water Heater (14½ U.S. gals.)	1,500	115	single
Kitchen Appliances	1,500	115	single
Equipment & Instrumentation	1,000	115	single
Refrigerator			
Air Compressor	15,000	208	3
Dehumidifier	1,000	115	single

Ground Fault Protection - Supply voltage 115/208 V AC 60 cycle Ampere rating 70 amps. Sensitivity 5 milliamperes. Tripping time 17 milliseconds.

Communications - Television; closed circuit monitors and entertainment. Audio; habitat to shore and standard telephone set. FM music.

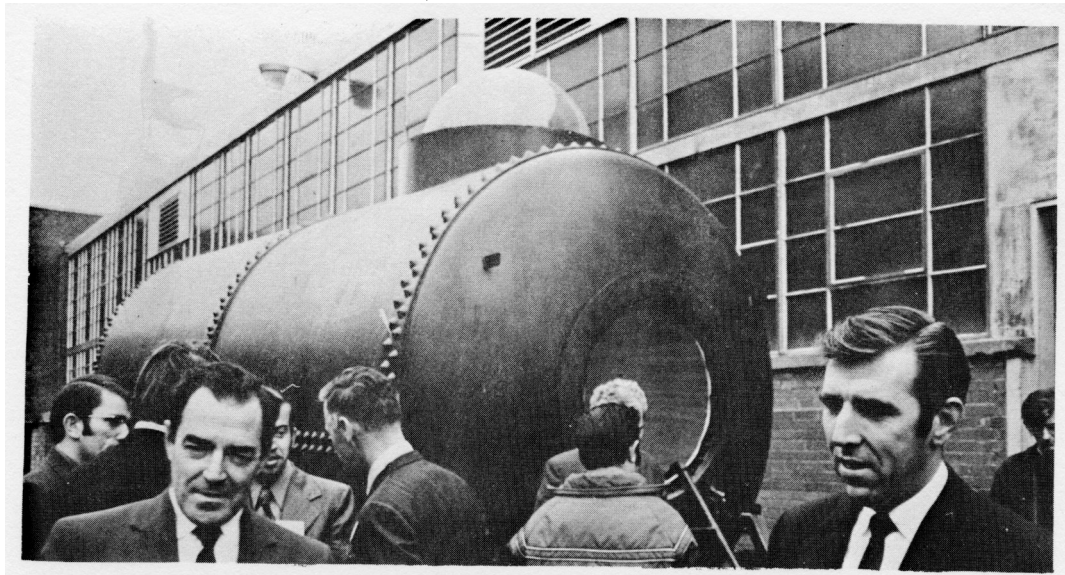


Figure 1 - Habitat on display at Memorial University of Newfoundland, St. John's, Nfld.

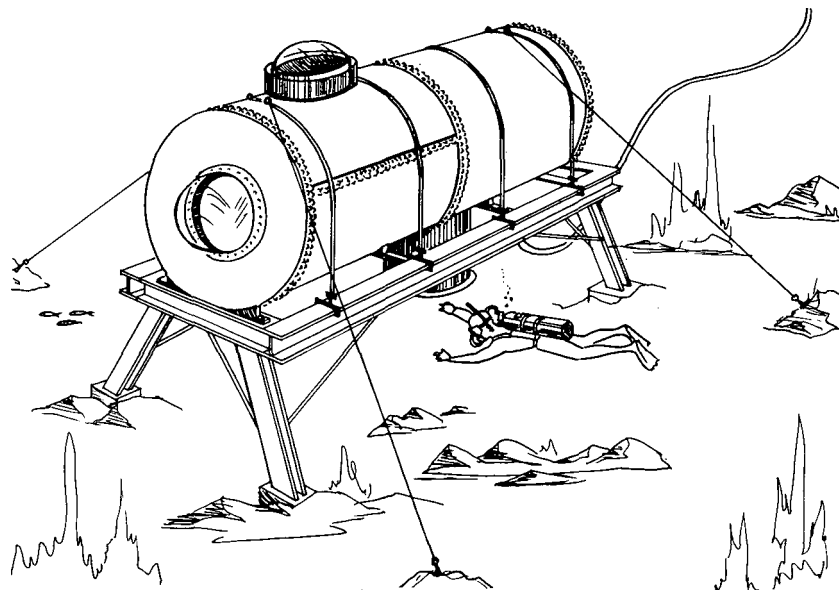


Figure 2 - Sketch showing Habitat anchored on sea floor with diver approaching the lock-out hatch, and umbilical line carrying services from nearby shore station.

Cruise of HUDSON 70 - Phase VIII - The Arctic Voyage: Cruise Objectives in the Western Arctic with Reference to the Earth Sciences Program of the Atlantic Oceanographic Laboratory, (Department of Energy, Mines & Resources) Dartmouth, Nova Scotia.

HUDSON 70 is a scientific expedition carried out by the scientific staff and crew of CSS HUDSON, A.O.L., with its goals set primarily at determining the nature, structure and composition of the continental shelf in the area of study. Equally as important as the earth sciences program is the environmental study dealing with hydrography and physical oceanography. As an assist to the private sector as well as government agencies the cruise will furnish considerable information that will be of value to the economic development of the Canadian north, in line with the government's policy of managing its own resources.

Results of the study may be summarized from weekly bulletins submitted to AOL, and from the following:

Water mass studies: The water mass was studied in three sections across the continental shelf beneath the Beaufort Sea, and its structure was determined. Various typical layers were defined which served as the framework for the biological studies that were undertaken at the same time. Most important was the delineation of a layer of fresh surface water overlying the saline waters, a phenomenon that had considerable influence on the fauna living in the water mass.

Biological studies: An excellent collection of marine zooplankton was made and animals are now available for study, and can be distributed on an international basis. Productivity studies will also be followed up from the initial collections. Phytoplankton blooms tended to obscure the zooplankton which is an important fact to be considered in these productivity studies. Marine zooplankton were not abundant near shore due to the influence of the Mackenzie River runoff of fresh water and discharge of silt.

Foraminiferal Plankton studies: Foraminifera were restricted to depths greater than 50 metres and to the outer continental shelf. This again is due to the Mackenzie River influence.

Bottom Fauna: Molluscs and other invertebrate shelly animals followed the same distributional pattern of the other marine organisms. Interestingly the small species occurred to the west and the larger to the east, but not many in the area of the Mackenzie River runoff or in deeper waters of the outer continental shelf.



Figure 1 - CCS HUDSON entering the ice pack in the southern Arctic Ocean, Beaufort Sea, in late August of 1970. (Published with permission of the Director, Atlantic Oceanographic Laboratory, Negative 1737, Photograph by R. Belanger, AOL).

Physiography: Continuous soundings revealed the major features of the sea floor: the Mackenzie Canyon, the regular surface of the continental shelf, and the break in the shelf and continental slope. Underwater pingos or ice blisters were also discovered, cored, and photographed. Due to expanding fresh water ice, these structures suggest the existence of a fresh water aquifer under the shelf, as one hypothesis on their origin.

Bottom Sediments: Generally pebbly sand occurs near shore with alternating belts of clays and sands in trends paralleling the coast and shelf break, with clay in the low areas or troughs, and sands in the high areas. The sands are thought to be relict ancient beaches and thus indicate conditions of a rising sea in the area.

Sediment Cores: Approximately 50 core samples were collected for detailed studies of sedimentation pattern and foraminiferal distribution. The cores from the Arctic shelf show well defined stratigraphy of dark coloured muds and dark laminated layers containing coaly material. In some cases the cores show a distinct faunal break from shallow-water types in the upper ten feet of the core, to deeper-water types in the lower part. Some cores from the shelf contain compact, ice-pressed clays which are difficult to penetrate. Two or three layers of sediments in cores ranging up to 40 feet in length, (the longest ever obtained in the Arctic) show old beach and river sands covered by fine muds and clays. This indicates a continuous rise in sea level relative to the shelf which has not rebounded from the loading of continental ice sheets. One core in Amundsen Gulf indicated a history of approximately 100,000 years, representing a much older inter-glacial period than the time of the last ice advance. One core showed shallow water fauna overlain by deeper fauna again suggesting a rising sea in the area of study.

Side-scan sonar experiments carried out for 800 miles in water depths up to 300 feet along the seismic lines, showed the presence of considerable ice scouring to 10 feet into the sedimentary sea bottom, but exceptionally to 30 feet. This has a significant implication in engineering works as it indicates structures such as pipelines, well-head completions may have to be buried should petroleum be discovered and produced offshore. Most scouring is in water up to 180 feet in depth but these may be ancient features produced at a time when sea level was relatively lower.

Seismic Profiles: 13 sections across the shelf and two along it, involving 1200 miles of survey, revealed that sedimentary layers dip gently seaward but near the outer shelf tend to roll and occur as moderately folded beds. Thickness, distribution and structure were delineated. Ancient river systems 1000 feet beneath sea level were discovered but are completely filled. Once again a condition of a rising sea are indicated. Engineering aspects are important as some indication of the thickness of sediment cover is given which is important for foundation studies.

Gravity Surveys: Resulted in the production of a new gravity map of the Beaufort Sea. A deep gravity low of more than 60 milligals occurs in the Mackenzie Canyon area and suggests a considerable thickness of sedimentary beds. This is a prime area for oil prospecting. Another low occurs off Atkinson Point which appears to be interesting country from an exploration point of view. A large gravity high of more than 70 milligals occurs east of the Mackenzie Canyon and associated gravity low, and extends the full length of the shelf toward the Archipelago. It may represent the occurrence of high density rocks or it may be the extension of an ancient mountain belt extending from the Arctic Islands.

Magnetic Surveys: Showed a trend that transects the gravity trend at a slight angle i.e. it is more-or-less subparallel. Density of data would not permit a magnetic map to be drawn but magnetograms, or profiles, were obtained on 12 cross sections of the shelf and on two tie lines crossing these sections.

Northwest Passage: Entering the passage from Gulf of Amundsen and through Prince of Wales Strait, Viscount Melville Sound and Barrow Strait, a line of scientific stations was maintained en route. Most significant was the corroboration that the Northern Arctic Islands had once stood much higher, that rivers had eroded them and were later modified by glacial action. Submergence occurred which was followed by present emergence. The fluctuation in sea level occurred over the last 10,000 years. Evidence of sea shells in old beach deposits occurring at several hundred feet above sea level together with the occurrence of plant leaves, old soils and river gravels in the cores at more than 1000 feet below sea level indicate this relative vertical movement of the earth's crust.

In the water mass, planktonic foraminifera occur abundantly in western Viscount Melville Sound and decrease over Barrow Strait. To the east in Lancaster Sound, they again increase due to the influence of Baffin Bay water, a fact which suggests a mixing of water in Lancaster Sound.

A significant feature of the Northwest Passage is the impact to navigation and science in the Arctic. Also highly important to Canadians is the fact that this country can mount such an expedition.

National Research Council of Canada through the Geological Survey of Canada has made the following research grants for the year 1970-71.

The list has been annotated to show those workers in eastern Canada investigating pertinent aspects of sediments and sedimentary rocks.

- BACHINSKI, D.J. - (U. of New Brunswick) Stratabound ore deposits.
- BARNES, C.R. - (U. of Waterloo) - Ordovician Arctic Conodonts.
- BARTLETT, G.A. - (Queen's U.) 1. Biotas, paleoenvironments and tectonic history of the Arctic and Atlantic Continental Margins and the Gulf of St. Lawrence. 2. Identification, effect and control of pollution in marine environments of the Atlantic provinces.
- BROWN, R.L. - (Carleton U.) Structural studies in Northern Appalachians.
- BRUECKNER, W.D. - (Memorial U.) 1. Geomorphic problems in Newfoundland. 2. Avalon bedrock geology.
- BURKE, K.B.S. - (New Brunswick) Investigation of tectonic framework of southeastern New Brunswick.
- DIXON, O.A. - (U. of Ottawa) Ordovician-Silurian carbonates of Somerset and Prince of Wales Island, District of Franklin.
- ELSON, J.A. - (McGill U.) Problems of glacial lake Agassiz.
- FAHRAEUS, L.E. - (Memorial U.) Studies of Lower Paleozoic conodonts from the Notre Dame Bay area.
- FYSON, W.K. - (U. of Ottawa) Relation of minor to major structures in the Maritime Provinces. Structural analysis of Lower Paleozoic rocks, Mt. Albert area, Gaspé Peninsula.
- GREENWOOD, B. - (U. of Toronto) Intertidal sedimentation.
- GREGORY, M.R. - (Dalhousie U.) Benthonic foraminifera and sediments: Baffin Bay.
- GREINER, H.R. - (U. of New Brunswick) Fossil fishes of the Maritime Provinces: their biologic and environmental implications.
- HILLAIRE-MARCEL, C. - (U. of Quebec) La Pléistocène marin des Basses Terres de Saint-Laurent.
- HOFMANN, H. - (U. of Montreal) Phanerozoic organosedimentary structures and problematica.
- KARROW, P.F. - (U. of Waterloo) Study of Pleistocene fossil beetle of the Toronto and Part Talbot sections, southwestern Ontario.
- KENNEDY, M.J. - (Memorial U.) Structural relationships within the Appalachians of northwestern Newfoundland.
- LAJTAI, E.Z. - (U. of New Brunswick) Dispersion of indicators by glacial transportation.
- LAWSON, D.E. - (U. of Waterloo) The significance of small-scale sedimentary structures in the fluvial environment.
- LESPERANCE, P.J. - (U. of Montreal) Biométrie de trilobites ordoviciens.
- LIBERTY, B.A. - (Brock U.) Palaeozoic mapping in southern Ontario.
- MIDDLETON, G.V. - (McMaster) Intertidal sediments.
- MUKHERJI, K.K. - (Loyola College) Thermoluminescence study of the Black River - Trenton Group in southern Ontario.
- NOBLE, J.P.A. - (New Brunswick) Silurian-Devonian stratigraphy of New Brunswick.
- OLDERSHAW, A.E. - (U. of Toronto) Diagenesis in carbonate sediments and sedimentary rocks.
- PEACH, P.A. - (Brock U.) Compilation of data on fossil plants from the Gunflint Formation Ontario (from material assembled by the late Dr. Moorehouse).
- RUST, B.R. - (U. of Ottawa) Pleistocene stratigraphy of the Gatineau River Valley.
- RUTHERFORD, G.K. - (Queen's U.) Nature and composition of sediments across a transect of Lake Ontario.
- SCHENK, P.E. - (Dalhousie U.) A stratigraphic and sedimentological study of the Lower Devonian of Nova Scotia.
- STEARNS, C.W. - (McGill U.) Calcareous sponges of stromatoporoid affinities.
- SUTTON, J.S. - (Memorial U.) Geology of the area from Cape Bay to La Poile, southwestern Newfoundland.
- TERASMAE, J. - (Brock U.) Late-Wisconsin geochronology in southern Ontario.
- WALKER, R.G. - (McMaster U.) Transport and deposition of resedimented conglomerates.
- WESTERMANN, G.E.G. - (McMaster U.) Form and function of ammonoid shells.
- WILLIAMS, H. - (Memorial U.) Stratigraphy of the Cinq Isle Formation and its relationships to nearby groups.
- YOLE, R.W. - (Carleton U.) Petrology and microfacies analysis, Paleozoic rocks of eastern Ontario and Mackenzie Valley.

FORTHCOMING MEETINGSEarth Science Symposium on Offshore Eastern Canada, Camsell Hall, 588 Booth St., Ottawa, Ont.,
February 22 - 24, 1971.Monday Afternoon, February 22nd:

Session Chairmen - P.J. Hood, Exploration Geophysics Division, Geological Survey of Canada;
and B.R. Pelletier, Bedford Institute

1. Regional Geology Eastern Canada Offshore - G.H. Austin and R.D. Howie (Austin Explorations)
2. The Continental Margin - M.J. Keen and C.E. Keen (Dalhousie University)
3. Tertiary and Late Mesozoic History of the Shelf Regions of the Eastern Canada Continental Margin - L. Smith (Queen's University)
4. The Canadian Atlantic Continental Margin - Paleogeography, Paleoclimatology and Seafloor Spreading - G.A. Bartlett (Queen's University)
5. Palaeomagnetism in Eastern Canada a Key for Reconstructing the Atlantic - E.R. Deutsch (Memorial University)
6. Paleolatitudes of Oilfields - Application to eastern Canada - J.L. Roy (Earth Physics Branch, Dept. of Energy, Mines & Resources)
7. Geodynamics Project - C. Drake (Dartmouth College, N.H.)

Tuesday Morning, February 23rd - Bay of Fundy and Scotian Shelf:

Session Chairmen - G.D. Hobson, Exploration Geophysics, Geological Survey of Canada; and
B.D. Loncarevic, Bedford Institute

8. Nova Scotia, Morocco and Continental Drift - P.E. Schenk (Dalhousie University)
9. Bedrock Geology of Scotian Shelf and Adjacent Areas - L.H. King (Bedford Institute)
10. Quaternary Sedimentation in the Bay of Fundy - D.J. Swift (Old Dominion University), B.R. Pelletier, (Bedford Institute), A.K. Lyall (Smithsonian Institution), J.A. Miller (University of Texas)
11. Spill-Over of Sediment from the Continental Shelf to the Slope and Rise off Nova Scotia - D.J. Stanley et al. (Smithsonian)
12. Geological Structure Beneath the Bay of Fundy and the Continental Margin from Ocean Tide Loading - C. Beaumont (Dalhousie University)
13. Seismic Profiler and Magnetometer Results from Scotian Shelf and Adjacent Areas - G.W. Webb (University of Massachusetts)
14. Marine Seismic - W.H. Elias (Catalina)
15. Magnetic Surveys of the Scotian Shelf - P. McGrath and P.J. Hood (Geological Survey of Canada)
16. The Sable Island Deep Test of the Scotian Shelf - D.H. Magnusson (Mobil Oil)

Tuesday Afternoon, February 23rd - Gulf of St. Lawrence:

Session Chairmen - W.H. Poole, Geological Survey of Canada; and P.J. Savage, Teledyne

17. Bedrock and Surficial Geology of the Northern Gulf of St. Lawrence as Interpreted from Continuous Seismic Reflection Profiles - J.M. Shearer (Geological Survey of Canada)
18. Marine Geology of the Gulf of St. Lawrence (1) Bedrock Geology; (2) Glacial & Postglacial Geology - D.H. Loring (Fisheries Research Board)
19. Sedimentary Seismic Surveys, Gulf of St. Lawrence - G.D. Hobson and A. Overton (Geological Survey of Canada)
20. Gravity Measurements in the Gulf of St. Lawrence - R.T. Haworth (Bedford Institute), A.B. Watts and A.K. Goodacre (Earth Physics Branch)
21. Aeromagnetic surveys of the Gulf of St. Lawrence - P. McGrath and P.J. Hood (Geological Survey of Canada)
22. Geological and Geophysical Results Bearing upon the Structural History of the Flemish Cap Region - A.C. Grant (Bedford Institute)
23. Structural Implications of Gravity and Magnetic Anomalies over Eastern Notre Dame Bay, Newfoundland - H.G. Miller (University of British Columbia) and E.R. Deutsch (Memorial Univ.)
24. Hudson Geotraverse - B.D. Loncarevic (Bedford Institute)
25. Structure of the Great Bank of Newfoundland and the Flemish Cap - R.F. MacNab (Bedford Institute)
26. Orphan Knoll - A "Chip" off the North American "Plate" - A. Ruffman (Bedford Institute) and J. Van Hinte (Imperial)

Wednesday Morning, February 24th - Labrador Sea and Baffin Bay:

Session Chairmen - E.R. Deutsch, Memorial University; and N.J. McMillan, Tenneco

27. Results of JOIDES Drilling in the Labrador Sea - A. Ruffman (Bedford Institute) and J. Van Hinte (Imperial)
28. Spreading History of the Labrador Sea - M.A. Mayhew (New York University)
29. Geochemistry of Interstitial Waters from Baffin Bay Marine Sediments - G.M. Friedman et al (Rensselaer)
30. Distribution patterns of benthonic and planktonic Foraminifera in Baffin Bay - M.R. Gregory

and C. Stehman (Dalhousie University)

31. Lateral and Vertical Variations in Sediments' Characteristics Within Baffin Bay - S.R. Baker and G.M. Friedman (Rensselaer)
32. Bathymetric Observations along the East Coast of Baffin Island - O.H. Løken (Inland Waters)
33. The Geological Setting of the West Greenland Basin - G. Henderson (Geological Survey of Greenland)

Wednesday Afternoon, February 24th - Baffin Bay and Labrador Sea:

Session Chairmen - M.J. Keen, Dalhousie University; and D.I. Ross, Bedford Institute

34. Magnetic Properties of Rock Samples from the Baffin Bay Coast - L.G. Kristjansson and E.R. Deutsch (Memorial University)
35. Magnetic Basement Mapping in the Sedimentary Basins of Nugssuaq, West Greenland - P.V. Sharma (University of Copenhagen)
36. Low-level aeromagnetic surveys of the continental shelves bordering Baffin Bay and the Labrador Sea - P.J. Hood and M.E. Bower (Geological Survey of Canada)
37. Cretaceous - Lower Tertiary Rift Basin of Baffin Bay - Continental Drift without Sea-Floor Spreading - R. Martin (Rudolf Martin & Associates Ltd.)
38. Geophysical and Geological Studies in Baffin Bay - R.D. Hyndman et al. (Dalhousie University)
39. Geophysical Studies on the Structure of Baffin Bay - D.L. Barrett et al. (Bedford Institute)
40. Icebergs: a New Problem for Offshore Oil Operations - J. Duval (Eastcan Exploration Ltd.)

24th International Geological Congress, Montreal, Quebec, Canada, August - September, 1972.

The following comments are from GEOCONG NEWS No. 2, August 1970 by C.G. Winder, University of Western Ontario, London, Canada. 6300 questionnaires received indicated the following chances of attendance: good - 3600; fair - 1800; slight - 900. More than 50,000 first circulars were sent out but many forms not received. To be included in the second circular, questionnaires must be completed and returned so that addresses can be stored in a computer's memory. Replies have come from 107 countries with 32 to hear from. The technical program has been organized in 17 sections and 6 symposia. Over 2,000 titles have been offered although only 750 will be presented.

1971 Joint Annual Meeting of the Geological Association of Canada and the Mineralogical Association of Canada, Laurentian University, Sudbury, Ont., May 13-15, 1971.

The program will feature three special sessions: (1) Sudbury Geology, with emphasis on evidence for and against an origin of the Sudbury Basin by meteorite impact - papers may be directed to Dr. J.V. Guy-Bray, International Nickel Company of Canada Limited, Copper Cliff, Ontario; (2) Huronian Stratigraphy and Sedimentation - papers to Dr. G. Young, Geology Department, University of Western Ontario, London, Ontario; (3) Sulphide - Silicate Systems - papers to Dr. S. Scott, Geology Department, University of Toronto, Toronto, Ontario. General papers under the regular divisions may be submitted to program chairman, J.C. Cowan, Falconbridge Nickel Mines Limited, Falconbridge, Ontario. Chairman of the organizing committee is Dr. D.H. Williamson and the secretary is Dr. J.F. Davies, both of Laurentian University, Sudbury, Ontario.

REPORTS ON RECENT MEETINGS

Central Canada University Geological Congress, Queen's University, Kingston, Ont., October 22-25, 1970.

The theme of the conference was "Geology of the 70's - the ocean decade". Transactions of the conference including the titles listed below will be published.

- B.R. Pelletier - Canadian Marine Geology: A look at the past and into the 70's
- A. McIntyre - Microorganisms as paleoceanographic indicators in the Atlantic Ocean
- S.J. Nelson - The Paleozoic Ocean
- J.T. Wilson - The life cycle of ocean basins - Key to the history of the earth's surface
- J.W. Murray - Structure of the continental shelf off Vancouver Island, B.C.
- B.D. Loncarevic - Marine Geology is Really Geophysics
- K.K. Turekian - Geochemistry of the Atlantic Ocean Basin
- R.L. Thomas - The Distribution and Geochemistry of Recent Sediments in Lake Ontario
- D.R. Derry - Mineral Exploration in Canada and its relationship to past and present oceans
- M.J. Colpitts - Ocean Technology - Man in and on the Ocean
- D.W. Axford - Petroleum in the Seas and on the Continental Shelves with particular reference to the opportunities in such areas in Canada