

Current Research

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CURRENT RESEARCH

RECENT SEDIMENTSMarine Geology at the Marine Sciences Centre, McGill University

The Marine Sciences Centre of MCGILL UNIVERSITY, Montreal, is an interdepartmental organization for graduate research in biology, physics, geology and meteorology as applied to the oceans, in which co-operation between the various aspects of the marine sciences is emphasized. The Centre has recently added a program of graduate studies in Marine Geology and Geophysics to its curriculum, and funds are available for students interested in acquiring Masters or Doctorate degrees in these disciplines.

A number of research activities are planned. General investigations of the Atlantic continental shelf and slope off the Canadian coast are run in co-operation with other institutions. Marine geology in the Gulf of St. Lawrence and the Arctic are planned, including research on fiords and tidal lakes along the Labrador and Baffin coasts, to gain information on Quaternary sea level fluctuations along the margin of the Shield; on suspended matter in the Gulf of St. Lawrence, to analyse the effects of the estuarine circulation in the Gulf on the dispersal of fine inorganic matter; on ice-rafted material, to estimate the possibilities of using sediments to reflect some major patterns of ice drift, etc. A joint cruise with BEDFORD INSTITUTE OF OCEANOGRAPHY is projected for 1967 in the Gulf.

Various other possibilities for research exist. Among these are a program on marine phosphorites in selected areas of California and Mexico, concerning processes and rates of deposition, chemistry of interstitial waters and related hydrography. In Barbados, British West Indies, where McGill operates the BELLAIRS RESEARCH INSTITUTE, there are possibilities of study as yet unexploited on the morphology, growth and decay processes of carbonate reefs and associated sediments. The shore processes along the coasts of this well exposed island are important from an ecological as well as a geological or human point of view, and deserve special study; a project on these has been outlined. Some research on carbonate sedimentation and nearshore morphology are currently being carried out by DR. E.W. MOUNTJOY and his graduate students in the Department of Geological Sciences. At a short distance to the west lies the Tobago Basin, a silled basin subject to the initial inflow of equatorial waters into the Caribbean, and influenced simultaneously by terrigenous detritus and pelagic sedimentation. Easily accessible, it offers excellent opportunities for studies of Recent and Pleistocene stratigraphy in the Caribbean. Coring in the basin and work along the Barbados Ridge are contemplated.

Additional information may be obtained by writing to DR. B.F. d'ANGLEJAN at the Marine Sciences Centre, McGill University, Montreal, P.Q.

ANCIENT SEDIMENTSComparison of Structures in Late Paleozoic, Atlantic Provinces and Britain

DR. GREGORY W. WEBB of the UNIVERSITY OF MASSACHUSETTS is engaged in a comparative study of late Paleozoic tectonics in the Atlantic Provinces and the British Isles, with particular emphasis on the history of wrench faulting. An attempt will be made to restore the various movements on a series of palinspastic maps and to approach the problem of stress orientations through

time. Five months in spring and summer 1966 were spent in the British Isles studying and visiting field localities, with space and facilities being most kindly provided by the UNIVERSITY OF GLASGOW. The work is an outgrowth of Dr. Webb's work in southern New Brunswick (WEBB, 1963, Bull. A.A.P.G.) and of a brief visit to Newfoundland in 1964. Field work will be continued in Newfoundland in 1967. The study is being supported by the NATIONAL SCIENCE FOUNDATION.

Geological Mapping in Newfoundland; New Geological Map

Compilation of a new geological map of the island of Newfoundland is presently in progress by DR. H. WILLIAMS of the GEOLOGICAL SURVEY OF CANADA in Ottawa. This map, one of a series of 16 mile to the inch multicoloured maps covering all of Canada, will probably be published early in 1967. In addition, Dr. Williams has completed work on the Red Indian Lake, east half, map area in Newfoundland, and a 4 mile to the inch map (12A E $\frac{1}{2}$) will appear in due course. The highlights of the geology of this area appeared earlier in the Geological Survey Paper 66-1, and further notes on the geology will be included in Paper 67-1, to be published shortly.

Bedrock Stratigraphy of the Atlantic Continental Margin

DRS. JOHN S. SCHLEE, K.O. EMERY and JAMES V.A. TRUMBULL were Chief Scientists aboard R/V Gosnold on a cruise last August out of WOODS HOLE OCEANOGRAPHIC INSTITUTION, to investigate the slope stratigraphy of the Atlantic continental margin from Norfolk Canyon off Norfolk, Virginia, north to Corsair Canyon, east of Cape Cod on the margin of Georges Bank. Dredge samples were taken at 113 stations, obtaining a wide range of lithologies; determination of the stratigraphic range sampled, however, must await paleontological analysis.

On October 15, James Trumbull made a dive in the research submarine Alvin to a depth of 1460 metres in Oceanographer Canyon, southeast of Cape Cod. A core of probable slump material was taken from the base of the west wall of the canyon.

Sedimentology in the Smithsonian Institution

The SMITHSONIAN INSTITUTION has been involved in research since its founding in 1846 by an Englishman, JAMES SMITHSON. The original bequest stipulated that the institution be founded "for the increase and diffusion of knowledge among men." It now has research facilities in many phases of science. One of the "spin-offs" of this research is the Weather Bureau; another might be considered the present U.S. space effort, because the Smithsonian financially supported R.H. GODDARD in his early experiments.

The U.S. NATIONAL MUSEUM, of which the MUSEUM OF NATURAL HISTORY is a part, is only one bureau within the Smithsonian. The U.S. National Museum is the official repository of natural history materials collected by other agencies of the U.S. government or with funds from the U.S. Government.

The DIVISION OF SEDIMENTOLOGY in the Museum of Natural History officially started only slightly over a year ago. This division, with the DEPARTMENT OF MINERAL SCIENCES, is responsible for the national collections

of sediments and sedimentary rocks, so fulfilling its mission within the U.S. National Museum. Staff scientists are encouraged to conduct basic, non-mission-oriented, research on sediments, sedimentary rocks or sedimentary processes, to fulfill the mission of the Smithsonian Institution.

Unique among government agencies, the Smithsonian is a private organization that operates on both public and private funds. This provides a flexibility not generally found in government agencies, although limitations do exist. In addition, in fiscal year 1966, Congress appropriated special funds for the direct support of individual research projects. With such support the individual scientist has more flexibility in his research program than with funds derived from regular institutional sources.

Original staffing plans for the Division called for about eight scientists who would devote their research and curatorial time to different specialities. These plans also called for two full-time technicians for each scientist. Initial staffing was decided on the basis of the museum function; the decision was made to concentrate primarily on recent marine sediments at the first by recruiting staff members with these interests.

Scientists are recruited primarily to fill needs for specific specialities. This procedure does not limit the scientist to these areas after joining the staff and the individual scientist can pursue any line of research in sedimentology that he desires. Any interesting lead uncovered by his present research can be followed. Likewise, there is no geographical limitation to their work. The promotion policy of the Smithsonian is set up so that a scientist need not be involved in administrative duties, except for his own research, if he does not desire to do so.

The Division of Sedimentology presently consists of three scientists, all of whom are interested in marine sediments, although not to the exclusion of the geological column. Future staffing plans are indefinite at the present.

M. GRANT GROSS, in conjunction with scientists of the U.S. Geological Survey, is working on drill cores from Midway Island, specifically on the dolomite problem and the geochemistry of the carbonates. He is also involved in research, with personnel from the UNIVERSITY OF WASHINGTON, on the radioactive material of the Columbia River discharge area. He is also starting a project on the chemistry of oceanic particulate matter.

J.W. PIERCE is working, informally with ORRIN PILKEY of DUKE UNIVERSITY, on sediments of the North Carolina shelf and coast. In addition, he is starting a project on the sedimentation processes on the coast and continental shelf of Argentina. This project is a formal agreement between the NATIONAL OCEANOGRAPHIC COMMITTEE OF ARGENTINA, DR. FREDERIC SIEGEL of THE GEORGE WASHINGTON UNIVERSITY, and Pierce.

DANIEL J. STANLEY, who joined the Division in October, is continuing the research interests that he had at DALHOUSIE UNIVERSITY. These include statistical analysis of coastal sand deposits, with PETER BUTTNER of the UNIVERSITY OF ROCHESTER; sediment dispersal patterns in Halifax Harbour; turbidites and flysch deposits of many areas; sediments of the continental slope and deep sea; and processes operative in submarine canyons.

Personnel in the division are always looking for on-going or proposed research programs to which they can contribute. They also welcome inquiries from interested scientists who might desire to work with scientists at the Smithsonian on one of the present projects. Information as to Division activities can be obtained by writing to any staff member of the division.

Space for storage of sediments and sedimentary rocks is available within the Museum of Natural History. There are 3200 cu feet of cold storage space and 5000 sq feet of atmospheric storage. Laboratory space, totalling about 500 sq feet, has been allocated to the division. Although it is not completely equipped as yet, basic facilities are available.

Division personnel have access to much equipment, either within the division or elsewhere within the Institution. Equipment is available for X-ray diffractometry, X-ray spectrography, electron probe analysis, and wet chemistry. Radiocarbon dating facilities are also available within the Smithsonian. Formal agreements and working arrangements with other institutions and scientists provide additional, mutually advantageous facilities.

The Smithsonian Institution has an active education-oriented program. This includes appointments, up to 10 weeks in length, for short term studies at the Institution. Most of these appointments are during the summer. Educational level of appointees vary from college sophomores to the graduate level. One-year pre-doctoral and post-doctoral appointments are also available. Stipends for each appointment depend on level of training. Fellowship appointments are handled through the Division of Education and Training.

J.W. PIERCE

Stop Press Item

Tertiary Formations on the Continental Slope off Nova Scotia

Interetsing results have recently been obtained by J.I. MARLOWE and G.A. BARTLETT of the BEDFORD INSTITUTE OF OCEANOGRAPHY, working on the continental slope off Nova Scotia in the vicinity of Sable Island. The work, begun in 1964, includes dredging for bedrock samples in the Gully, a large submarine canyon 20 miles east of Sable Island. Several trawls taken in November from CSS Hudson showed the existence of a sequence of Oligocene to mid-Miocene rocks in that area. Most of the samples were dark brown to dark grey compact siltstones with well-defined bedding and angular to blocky shapes, and therefore unlikely to be anything but bedrock. When disaggregated, some of the samples gave off a strong odour of hydrocarbons.