

GEOPHYSICS AND GEOCHEMISTRY

J. TUZO WILSON, Professor of Geophysics at the UNIVERSITY OF TORONTO, and several of his colleagues are engaged in studies in the Atlantic Provinces. In this area, Professor Wilson has been concerned with two major projects: continental drift and the Cabot Fault trans-current fault system. A résumé of these two projects which he sent to MARITIME SEDIMENTS is reproduced below:

Continental Drift - by studying the literature of the geology of ocean islands and of opposing ocean coasts which may at one time have been in contact, I have been examining the evidence for continental drift especially in the Atlantic Basin. Some papers have already been published and one is in press which was given at the Royal Society of London Symposium on Continental Drift in March, 1964, entitled, "Evidence from Ocean Islands Suggesting Movements in the Earth". As a result of this investigation, I suggested that there should possibly be a mid-ocean ridge up the centre of Baffin Bay. C. DRAKE and P. J. HOOD have produced some geophysical evidence for it. To check the matter further, I received a grant from the DEPARTMENT OF NORTHERN AFFAIRS and NATURAL RESOURCES which enabled a graduate student, Mr. D. B. CLARKE, to spend two months between Broughton Island and Cape Dyer mapping lavas of previously uncertain age which had been reported there. I accompanied Mr. Clarke for the first three weeks of the field season. Clarke was able to establish that there are some twenty patches of lavas in an area fifty-five miles long but not more than one-half mile wide. In the most part, these lavas rest on an extremely irregular Precambrian surface, but in several localities, the base is interbedded with sediments of probable Cretaceous age. These sandstones, shales, and conglomerates contain many fossil plants.

At Cape Searle, the coast was observed to be down-faulted in a series of steps. The few dikes observed were parallel with the coastline and nearly vertical. This work is continuing and we plan to compare stratigraphy and fossils with those found in West Greenland.

Cabot Fault - The Major Transcurrent Fault System in the Maritimes:

An examination of the geological literature of Newfoundland, Nova Scotia, and New England and of the aeromagnetic maps of intervening channels suggests that a single great fault system of Late Palaeozoic age may have extended from the northern tip of Newfoundland to Rhode Island. This was named the Cabot Fault. It was further suggested that if the Atlantic Ocean had opened by continental drift in Mesozoic time, that this fault might at one time have been part of the same system as the Great Glen Fault of Scotland.

Publications

- WILSON, J. T., 1962, Cabot Fault, an Appalachian equivalent of the San Andreas and Great Glen Faults and some implications for continental displacement: Nature, v. 195, p. 135-138.
- _____, 1962, Some further evidence in support of the Cabot Fault, a great Palaeozoic transcurrent fault zone in the Atlantic Provinces and New England: Trans. Roy. Soc. Canada, ser. 3, v. 56, p. 31-36.
- _____, 1963, A resume of the geology of the islands in the main ocean basins, v. 1, Atlantic and Indian Oceans, v. 2, Pacific Ocean: Univ. Toronto, Inst. Earth Sci., Contract no. A F 19 (628) 22, Sci. Rept. no. 4.
- _____, 1963, An hypothesis of earth's behavior: Nature, v. 198, p. 925-929.
- _____, 1963, Are the continents drifting?: The UNESCO Courier.
- _____, 1963, Continental Drift: Sci. Am., v. 208, p. 86-100.
- _____, 1963, Evidence from islands on the spreading of ocean floors: Nature, v. 197, p. 536-538.
- _____, 1963, Pattern of uplifted islands in the main ocean basins: Science, v. 139, p. 592-594.
- _____, 1963, The Cabot and Great Glen Faults: Nature, v. 197, p. 680-681.
- _____, 1964, The movement of continents: ICSU Rev. World Science, p. 84-91.

A description by D. H. LORING of geochemical petrologic studies, including geochemistry, of the sediments of the River and Gulf of St. Lawrence is outlined in the RECENT SEDIMENT STUDIES SECTION of this issue.

The DOMINION OBSERVATORY OF CANADA conducted gravity profile surveys across the ultrabasic rocks of the Bay of Islands and Hare Bay, Newfoundland.

R. W. BOYLE, of the GEOLOGICAL SURVEY OF CANADA at Ottawa, Ontario has geochemistry and ore deposits as principal interests. He is presently working in the Bathurst-Newcastle area in New Brunswick. Completion of work in the Walton-Cheverie area of Nova Scotia is also underway. Dr. Boyle and his colleagues are working on the following specific projects:

Geochemistry of rocks, including sediments and volcanics in the Bathurst-Newcastle area and the geochemistry of the sediments in the Walton-Cheverie area, Nova Scotia. These studies include trace element and major element analyses of the rocks. The trace elements determined include Pb, Zn, Cu, As, Sb, Ag, Au, Ba, Sr, Mo, W, Bi, Se, and S.

Geochemistry of the sulphide deposits in the Bathurst-Newcastle area and the barite-sulphide deposit at Walton, Nova Scotia.

Geochemical reconnaissance of stream sediments in the Walton-Cheverie area, Nova Scotia, and Bathurst-Newcastle area, New Brunswick. The elements determined include Pb, Zn, Cu, As, Sb, Ag, Ba, Sr, Mo, W, Bi, and Mn.

The methods of study include those normal for geochemical studies. The elements are determined by normal chemical methods, by colorimetric trace element methods, and by spectrographic methods. The study of the geochemistry of the rocks and ore deposits in the Bathurst-Newcastle area is a continuing one and will take about five years to complete. Geochemical reconnaissance of stream sediments in the Bathurst-Newcastle area will begin in the summer of 1965 and will take about three summers to complete.

Publications

- BOYLE, R. W., 1963, Geology of the barite, gypsum, manganese and lead-zinc-copper-silver deposits of the Walter-Cheverie area, Nova Scotia: Geol. Survey Canada, Paper 62-25.
- BOYLE, R. W., CHAMBERLAIN, J. A., HOLMAN, R.H.C., and SMITH, A. Y., Eight papers on regional geochemistry in Canada: Geol. Survey Canada, Paper 63-23.
- BOYLE, R. W., and DAVIES, J. L., 1964, Geology of the Austin Brook and Brunswick No. 6 sulphide deposits, Gloucester County, New Brunswick: Geol. Survey Canada, Paper 63-24.
- BOYLE, R. W., KOEHLER, G. F., MOXHAM, R. L., and PALMER, H. C., 1958, Heavy metal (Zn, Cu, Pb) content of water and sediments in the streams, rivers, and lakes of southwestern Nova Scotia: Geol. Survey Canada, Paper 58-1.
- SMITH, A. Y., 1960, Heavy metal (Zn, Pb, Cu) content of stream sediments of part of Westmorland County, New Brunswick: Geol. Survey Canada, Paper 59-12.
- SMITH, A. Y., 1963, Copper, lead, and zinc content of stream sediments in southeastern New Brunswick: Geol. Survey Canada, Paper 62-22.