

better sorting; they are subject to size variations that indicate transport in a south-westerly direction, presumably on the ebb tide. Interesting sedimentary structures are observed on the bar flanks and in the troughs as a result of water seepage from the bar.

The majority of this study comprised an M.Sc. thesis by ALI (1964) under the supervision of the senior author. Work is proceeding further to evaluate the conclusions reached, and will mainly concern the relationship of processes to sedimentary trends. More detail of the latter will be derived from further sampling and analysis, making comparisons with the original samples collected in 1963. Aerial photographs taken in 1953 and 1962 will be supplemented by a series taken at varying states of tide using a small aircraft, and an attempt will be made to map the surface tidal currents using markers dropped from the air. A detailed sounding survey will be made of the offshore portion of the delta to delineate the submerged bars and to look for any sea floor channels likely to be connected with turbid river-flood currents. The internal structure of the exposed bars will be examined between tides using earth-moving machinery and/or student labour. It is hoped that sparker traversing will also be arranged.

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Structural Studies in Paleozoic Rocks, Nova Scotia and Gaspé

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The coastlines of Gaspé and Nova Scotia provide some excellently exposed sections of deformed Paleozoic rocks. In contrast, inland, apart from along a few streams, surficial deposits and bush effectively mask most of the Paleozoic backbone of the two peninsulas. The long-term projects of obtaining general histories of deformation have thus depended first on detailed structural studies of the coastal areas, and then, with the fragments of information from elsewhere, a great deal of imagination and extrapolation.

W.K. FYSON is studying the structures in Nova Scotia in both Carboniferous and pre-Carboniferous rocks (1964a, 1964b, 1966, inpress, and with BOUCOT et al in ms.), and Ph.D. student A.H. SIKANDER is concerned with the lower Palaeozoic rocks near Matane, Québec. They have been supported by the NATIONAL ADVISORY COMMITTEE of the GEOLOGICAL SURVEY OF CANADA, and have been greatly helped by the many recently published maps of the Geological Survey of Canada and the QUÉBEC DEPARTMENT OF MINES.

The stratigraphic position of many of the deformed Paleozoic rocks in both Nova Scotia and Gaspé is still in doubt, and the exact timing and correlation of structural events from one area to another is not yet possible. However, some tentative generalizations made from the studies to date in Nova Scotia may be of interest to those concerned with the stratigraphy, and to those who might like to move the province around the Atlantic.

Prominent angular unconformities, such as occur within the Carboniferous, may indicate periods of local upwarping, but not necessarily periods of extensive folding. The apparent angular nature of such unconformities may have been increased by later disharmonic folding, especially where a thick basal conglomerate acted as a rigid unit.

Over a large part of mainland Nova Scotia, the Meguma Group (Cambro-Ordovician?), as well as the Silurian-Lower Devonian rocks in the northern Annapolis Valley and at Arisaig, have been subjected to at least three phases of deformation accompanied by folding and faulting. The main folds, which determine the general outcrop pattern, were followed by structures that suggest compression aligned east-west both before and after the emplacement of the mid-Devonian granites.

Major faults, such as the Cobequid Fault and its possible extension the Hollow Fault, trend east to northeast parallel to the main folds in the Lower Paleozoic rocks. Movements along these faults have been complex, but in part dextral strike-slip in both pre-Carboniferous and Carboniferous or later times.

The main folds in the Carboniferous rocks trend closely parallel to the earlier main folds of mid-Devonian (Acadian) age. The folds in the Carboniferous are overturned toward the areas of thickest Carboniferous sedimentation. The folding may be accounted for by gravity sliding toward the areas of greatest subsidence; both sedimentation and folding were controlled by vertical movements along the pre-existing major faults which lie parallel to the Acadian folds. Obviously, detailed sedimentary studies are necessary to test this theory.

Cross-folds in the Carboniferous rocks appear to have closely followed the main folds. Like earlier cross-folds in the pre-Carboniferous rocks, they developed in association with strike-slip movements along the major faults. Thus a long continued alternation between vertical and horizontal movements along the faults is suggested. The mechanism of this alternation and the relationship between strike-slip faulting and gravity sliding are perhaps some of the major structural problems of general application posed by the studies in Nova Scotia.

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Studies on the Devonian Strata
of Chaleur Bay, Québec

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McGERRIGLE (1950) and CUMMING (1959) have conducted an appreciable amount of stratigraphic and paleontological work on the Devonian strata of Eastern Gaspé. To the south, however, little has been done since the days of KINDLE (1930) and ALCOCK (1935) on the magnificent Devonian exposures on the north side of Chaleur Bay and the Restigouche River. The fish fauna of the famous Escuminac Formation in this area has been a continued study by several generations of vertebrate paleontologists (WHITEAVES, 1880, ØRVIG, 1957), but scant attention has been paid to the sedimentology of the Gaspé Devonian. KINDLE (1930), BÉLAND (1958) and CARBONNEAU (1959) all comment on diverse environments of deposition, especially in the more "continental" types of beds, and in so doing reveal the possibilities for sedimentology research in this area.

The present writers began research on some aspects of the sedimentation of the Chaleur Bay sequence in October, 1964. The Devonian stratigraphy of this sequence has been completely re-evaluated and the sedimentology of three formations analysed in detail; particular emphasis has been laid on interpretation of the depositional environment of the Escuminac Formation.

Stratigraphy.

The following table compares the stratigraphy of ALCOCK (1935) with the results of the present study: