

ABSTRACTS

A lot of valuable information on Canadian geology is available in the form of theses which have been written in partial fulfilment of requirements for degrees at various universities. Generally this information is not extensively used because few geologists know about it. In an attempt to remedy this situation, the editors intend to publish abstracts of stratigraphic, paleontologic, structural and other relevant theses on Canada and bordering areas in this and future issues of the Bulletin. These theses are available on loan from the universities involved. Canadian universities have been contacted for these abstracts, and universities outside of Canada are also invited to submit abstracts of this nature.

DEVONIAN STRATIGRAPHY AND PALEONTOLOGY OF THE RAM RIVER AREA, ALBERTA

GORDON L. BELL

1951, M.A., University of British Columbia.

This thesis represents a field and paleontological study of Devonian strata exposed in the Ram River Area west of Nordegg, Alberta, and is intended to present information which will supplement data obtained from exploration drilling of the Great Plains basin.

Certain structural phenomena are discussed in relation to the problems of the Rocky Mountain overthrust belt. It is concluded that overfolding in many cases preceded thrust fault development, that modification of Lawson's equation may be necessary in the consideration of low-angle thrust faults, and that the Eastern Ranges may have suffered less displacement than those of the Western Rockies.

The principles of regional and interregional correlation are discussed with a view to evaluation of the criteria and limitations of biostratigraphic correlation. Previous stratigraphic work is reviewed, and detailed descriptions of the Flume, Perdrix, and Cheviot Formations are submitted. The Perdrix Formation is recognized as being divisible into two new members, the Blackface and Whitegoat Members.

Faunal description, revision, and illustration of five species of corals and thirty species of brachiopods constitute the main part of the work. Revision shows that *Leiorhynchus albertense* Warren is referable to *Calvmaria*, and that *Bellerophon neleum* Hall and Whitfield is referable to *Aglaeoglypta*. One variety, *Calvmaria albertense* var. *plicata* is recognized as new.

A SEDIMENTATION STUDY OF THE SLOCAN SERIES, SANDON AREA, BRITISH COLUMBIA

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1951, M.S., University of British Columbia

A study of the Slocan Series of South Eastern British Columbia along the three related paths of Lithology, Biology and Tectonics is made. The Lithotopes studied are mainly microscopic, though some megascopic characters are used to determine bottom conditions. The microscopic work was done on slides made from specimens taken at random on a cross-section of these sediments from near Zincton, B.C. along the valleys of Seaton and Carpenter Creeks, to New Denver, B.C. The specimens indicated an increase of grain size and feldspar content from the bottom of the section towards the top. This is correlated with an increase in sediment supply and rate of subsidence. The fossils found by Cairnes show that these sediments were laid down in marine waters. A study of lithologic assemblages and types lead to some hypotheses. These, taken with a study of the Windermere geosynclinal assemblage, and theoretical considerations based on the orogenic cycle, allow a history of the area to be made. This history indicates that the Slocan Series, while the result of a separate downwarp of the crust, is probably part of the complex Purcell-Windermere geosynclinal sequence.

A LOWER CAMBRIAN TRILOBITE FAUNA FROM NEAR CRANBROOK, B.C.

RAYMOND VICTOR BEST

1952, M.Sc., University of British Columbia

Trilobites typical of the well-known *Olenellus* zone of the Lower Cambrian constitute a large collection from the Eager Formation, near Cranbrook, B.C. Their classification is discussed and two new species described: *Olenellus eagerensis* n.sp. and *Olenellus schofieldi* n.sp.

Since the use of certain structures in classifying olenellids has been disputed in the past, these and other less controversial features are critically examined, insofar as they apply to the genera and species present.

From this study the writer assembles criteria which might be used by later workers to re-define the generic and specific positions of selected species of *Olenellus* and *Paedeumias*.

SOME GEOLOGIC FACTORS RELATING TO THE LABORATORY EXAMINATION OF RECENT SEDIMENTS

RALPH BELMORE TOOMBS

1953, M.A., University of British Columbia

In selecting suitable procedures for the laboratory investigation of recent sediments, the first step suggested is that of examining conditions in the geologic environment that influence sediment properties. This step is illustrated by reference to the geologic history and physical features of a British Columbia fiord as a basis for assessing environmental conditions affecting the fiord sediments. Having inquired into the conditions surrounding the origin of sediments, the laboratory investigator is better prepared to emphasize those procedures which will provide the most significant types of data.

In this project, a number of properties of recent sediments are investigated by physical, chemical and mechanical analyses, by the binocular, petrographic and electron microscopes, and by X-ray diffraction, spectroscopy, and differential thermal analysis; techniques are selected on the basis of a study of the fundamental geologic principles relating to each sediment property. A number of statistical devices are employed in the presentation of data. Illustration is given of the utility of geologic data, as obtained in the laboratory, to investigators in the fields of soil mechanics, pedology and ceramics.

The sediments examined during this study were obtained as bottom and core samples from Bute Inlet. They are best described as "rock flour"; the sand fraction does not exceed 5% and the minerals are relatively unaltered; the clay-size fraction averages 25% but there is no discernible clay mineral content. Mineralogically the sediments can be related, to a certain degree, to drainage basin geology. Information obtained to date on the Bute Inlet sedimentary environment suggests that sediments accumulating there are not characteristic of those which might be classified as source beds for petroleum.

SOME DEVONIAN BRACHIOPODS REPORTED FROM WESTERN CANADA

JOHN A. C. FORTESCUE

1954, M.Sc., University of British Columbia

The aim of this study was to compile a list of descriptions of genera and species of brachiopod fossils which have been reported by various authors from the Devonian rocks of Canada, West of the 110th meridian.

This thesis is divided into two parts. The first part is essentially bibliographical. The second part contains descriptions of genera and species of brachiopods.

The bibliography in Part I contains forty references from which brachiopod faunal lists were compiled. Part I also contains an index map showing the geographical location of outcrop areas from which the fossils were collected, and a chart showing the stratigraphic range of brachiopod genera in a typical Devonian section of the Southern Rocky Mountains.

In Part II, the brachiopod faunal lists have been arranged in a systematic manner. They are supplemented by detailed descriptions of fifty-one genera and ninety-eight species. The descriptions are prefaced by a short discussion of biological classification; a note on the modern concept of species; a glossary of brachiopod terminology, and a short list of important references on this group of fossils. All the descriptions are taken from the literature on the subject because none of the type material is presently at the University of British Columbia. The brachiopod descriptions are arranged by superfamilies.

Conclusions are drawn regarding the scope and limitations of this study. Some suggestions are offered for the further study of this group of fossils.

**CORALS FROM THE RUNDLE FORMATION
(MISSISSIPPIAN) OF BANFF, ALBERTA**

FRIDTJOF ALOERT FREBOLD

1955, M.Sc., University of Alberta

This thesis contains descriptions and illustrations of six genera and seven species of fossil corals collected by the writer on Mount Norquay, Banff National Park, Alberta. A brief discussion of the fossil locality and stratigraphy of the Rundle formation in that area is given.

As a result of statistical research and graphic representation, a new species, *Faberophyllum multiseptatum* is described. The new species is closely related to *F. languidum*, *F. leathamense*, *F. pisgahense*, and *F. araneosum*. The species *Ekvasophyllum banffense* is proposed, and the species *Lophyphyllum cascadenense* Warren is redescribed and referred to the genus *Ekvasophyllum*. The genera *Triplophyllites* and *Cyathoclisia*, which previously have not been described from Canada, are recognized and briefly discussed. The descriptions of *Lithostrotion whitneyi* and *Lithostrotionella banffensis* are revised and adequately illustrated.

From the study of corals from the upper Rundle formation, the writer concludes that these may be important horizon markers, and recommendations are made for more extensive and detailed work on this subject.

**A COMPARISON OF THE DIAGENETIC AND DIAGNOSTIC FEATURES OF THE
STURGEON LAKE, NORMANDVILLE AND CLAIRMONT REEF COMPLEXES**

G. A. LESLIE

1955, M.Sc., University of Alberta

Investigations of the chemical composition, diagenetic changes and fossil remains have been conducted on cores and cuttings samples from Sturgeon Lake, Normandville and Clairmont Upper Devonian reef complexes. By integrating the results obtained with regional stratigraphic features, suggestions are postulated as to the basinal orientation of the reefs and their tectonic history.

It is apparent that reefs developed at Sturgeon Lake and Normandville on gently subsiding platforms in clear, shallow basinal environments. The Sturgeon Lake reef complex, which is remarkably thick, massive and homogeneous lithologically, is indicative of stable conditions during deposition; in contrast to the less stable conditions indicated by cyclic phases of deposition in the Normandville complex. The diagenetic features of the Clairmont and western off-reef Sturgeon Lake sediments suggest a stable shelf or a restricted back reef depositional environment.

Reef development appears to have been abruptly terminated by a major diastrophic event, followed by undulating platform conditions. A slight pivoting about the Peace River high and moderate tilting into the Cordilleran geosyncline was the final tectonic stage in the orientation of the reefs.

**AN INVESTIGATION OF THE DEVONIAN RHYNCHONELLIDS
OF THE GREAT WESTERN BASIN**

L. B. MacRAE

1955, M.Sc. University of Alberta

Study has been made of 19 species of Devonian Rhynchonellid brachiopods, including 7 species of *Nudirostra*; 1 species of *Basilicorhynchus*; 5 species of *Camarotoechia*; 2 species of *Pugnoides*; 3 species of *Hypothyridina*; and 1 species of *Eatonia*.

Internal sections are figured and described of at least one species of each genus from the University of Alberta collections.

An attempt has been made to place the Devonian Rhynchonellids in previously determined Rhynchonellid zones, although little information is available to the exact stratigraphic positions of the collections.

The Devonian Rhynchonellid zones are compared to the zones proposed by Warren and Stelek (1950), with an attempt to clarify any discrepancies which arise. General conclusions follow the above comparisons.

AGE AND ORIGIN OF THE McMURRAY FORMATION

G. B. MELLON

1955, M.Sc., University of Alberta

Samples from an almost complete core of the basal part of the Clearwater Formation and the McMurray Formation were examined for their microfaunal content. Twenty-one species of Foraminifera and one species of Ostracoda are reported from the Clearwater Formation, along with seven species of Foraminifera are described and figured.

The upper part of the McMurray Formation is demonstrated to be marine, deposited in a shallow, brackish-water lagoon, and is transitional from the lower, presumably continental beds of the Formation, upwards into the marine, epineritic shales of the Clearwater Formation. Using Foraminifera, the base of the Clearwater Formation and the upper part of the McMurray Formation are correlative with the upper part of the Loon River Formation, and the lower part of the Moosebar Formation.

Examination of heavy mineral residues from the McMurray Formation shows two distinct suites are present: first-cycle minerals derived from an igneous-metamorphic terrane, and second-cycle tourmaline and zircon derived from pre-existing sediments. Unstable and metastable minerals, such as amphiboles and pyroxenes, are absent or very rare.

Conclusions reached are that the upper part, and possibly all, of the McMurray Formation is middle Albian in age, deposited contemporaneously with and marginal to the westward-lying Loon River sea. Source of the sediments is to the east, derived in part from Precambrian igneous and metamorphic rocks, and in part from pre-existing sediments.