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CARBONIFEROUS BIOSTRATIGRAPHY AND CORRELATION, NORTHEASTERN BRITISH COLUMBIA AND SOUTHWESTERN DISTRICT OF MACKENZIE

E. W. Bamber and B. L. Mamet

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Preface

The thick, extremely variable succession of petroleum-bearing Carboniferous strata in northeastern British Columbia represents a significant episode in the geological history of western Canada. Precise stratigraphic correlations, which are so important for petroleum exploration within this succession have long been hindered by lack of paleontological data. This bulletin presents the detailed paleontological control necessary for such internal correlations, outlines the main lithological changes within the area, and demonstrates that the local sequence of faunal zones is consistent with a previously established zonation applicable to the whole of western North America.

Such detailed information contributes to the accurate estimation of potential abundance and probable distribution of mineral and fuel resources in Canada.

D. J. McLaren
Director-General
Geological Survey of Canada

Ottawa, September 1977

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CARBONIFEROUS BIOSTRATIGRAPHY AND CORRELATION, NORTHEASTERN BRITISH COLUMBIA AND SOUTHWESTERN DISTRICT OF MACKENZIE

Abstract

Regional stratigraphic and faunal distribution data from 5 surface stratigraphic sections and 37 subsurface sections indicate the following ages and stratigraphic relationships within the Lower Carboniferous succession of the area. The Banff Formation (Early? and Middle Tournaisian, Plains), which consists of shale with minor amounts of siltstone and limestone, passes westward into equivalent shale and chert of the Besa River Formation. The Pekisko Formation (Middle Tournaisian, Plains), composed of skeletal limestone and wackestone, and the "Shunda" Formation (Late Tournaisian, Plains), comprising argillaceous limestone, calcareous shale and minor amounts of skeletal and pelletoid limestone, change facies westward, near the eastern edge of the disturbed belt, into the upper Besa River Formation and Member A of the Prophet Formation, and are equivalent to the upper Clausen and lower Flett formations to the north (southern Mackenzie Mountains). The lower member of the Debolt Formation (Early and Early Middle Viséan, Plains), composed of micritic and skeletal limestone, wackestone and calcareous shale, grades westward into the cherty dolomite and limestone of Member B of the Prophet Formation and is correlated with the limestone and calcareous shale of the middle Flett Formation. The upper member of the Debolt Formation (Late Middle and Early Late Viséan, Plains) consists of pelletoid, micritic, argillaceous and skeletal limestone with minor amounts of calcareous shale and dolomite, and is correlative with the cherty, skeletal limestone of Member C and the upper part of Member B of the Prophet Formation, and with the skeletal limestone and calcareous shale of the upper Flett Formation. The cherty carbonates of the Prophet Formation (Late? Tournaisian to Early Late Viséan) occur in the outcrop belt and westernmost plains of northeastern British Columbia and change facies into the Besa River Formation by a progressive increase in shale and chert from base to top toward the west. The Stoddart Group (Early Late Viséan to ?Pennsylvanian), which consists of terrigenous clastics and carbonates, occurs in the plains and outcrop belt of northeastern British Columbia, and grades northward into the coarse-grained, partly continental clastics of the Mattson Formation, and westward into the shale of the Besa River Formation.

Eleven Middle Tournaisian to Late Viséan foraminiferal zones within the area correspond to zones previously established for the North American Cordillera, and correlate with the original Lower Carboniferous stratigraphic sequence of Eurasia. There is a consistent relationship between the vertical and lateral distribution of foraminiferal zones and associated macrofaunal assemblages. With minor exceptions, the combined faunal succession of this area matches that in southwestern Alberta and western United States and forms part of a consistent biostratigraphic scheme applicable to Lower Carboniferous rocks throughout western North America.

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Résumé

Les données relatives à la distribution stratigraphique et faunique régionale provenant de l'étude de 5 coupes stratigraphiques en surface et de 37 coupes profondes indiquent les âges et les relations stratigraphiques suivants à l'intérieur de la succession du Carbonifère inférieur de cette région. La formation de Banff (Tournaisien inférieur? et moyen, Plaines) constituée de schiste argileux avec de faibles quantités de siltstone et de calcaire passe, à l'ouest, au schiste argileux et siliceux contemporain, de la formation de Besa River. La formation de Pekisko (Tournaisien moyen, Plaines) composée de calcaire bioclastique et de calcarénite; et la formation "Shunda" (Tournaisien supérieur, Plaines) composée de calcaire argileux, de schiste calcaire et de faibles quantités de calcaire bioclastique et de calcaire graveleux, changent de faciès à l'ouest, près du bord est de la zone de dislocations; elles s'identifient alors à la formation de Besa River supérieure et au membre A de la formation de Prophet et sont l'équivalent des formations de Clausen (supérieure) et de Flett (inférieure) au nord (sud des monts Mackenzie). Le niveau inférieur de la formation de Debolt (Viséen inférieur et début du Viséen moyen, Plaines) composé de calcaire microgranulaire, de calcaire bioclastique, de calcarénite et de schiste calcaire, passe insensiblement, en direction ouest, à la dolomie à chert et au calcaire du niveau B de la formation de Prophet et correspond au calcaire et au schiste calcaire du milieu de la formation de Flett. Le niveau supérieur de la formation de Debolt (fin du Viséen moyen et début du Viséen supérieur, Plaines) est constitué de calcaire graveleux, de calcaire microgranulaire, de calcaire argileux et de calcaire bioclastique, avec de faibles quantités de schiste argileux et de dolomie, et correspond au calcaire à chert et au calcaire bioclastique du niveau C et à la partie supérieure du niveau B de la formation de Prophet, ainsi qu'au calcaire bioclastique et au schiste calcaire de la formation de Flett (supérieure). On trouve des roches carbonatées à chert de la formation de Prophet (du Tournaisien supérieur? au début du Viséen supérieur) dans la zone d'affleurements et les plaines les plus à l'ouest du nord-est de la Colombie-Britannique; d'autre part, ils passent à la formation de Besa River par accroissement progressif de la quantité de schiste et de schiste siliceux de la base au sommet, en direction de l'ouest. On trouve le groupe de Stoddard (début du Viséen supérieur jusqu'au ?Pennsylvanien) composé de roches clastiques terrigènes et de roches carbonatées dans les plaines et la zone d'affleurements du nord-est de la Colombie-Britannique; d'autre part, ce groupe passe insensiblement, en direction du nord, aux roches clastiques à grains grossiers, partiellement continentales, de la formation de Mattson et, en direction de l'ouest, au schiste de la formation de Besa River.

Dans cette région, 11 zones à foraminifères allant du Tournaisien moyen au Viséen supérieur correspondent à celles qui avaient déjà été établies pour la Cordillère nord-américaine, et sont en corrélation avec la série stratigraphique originale du Carbonifère inférieur de l'Eurasie. La répartition verticale et horizontale des zones à foraminifères et des ensembles de macrofaunes connexes suit un schéma d'uniformité. Sauf quelques exceptions, l'ensemble des faunes successives de cette région est conforme à celle du sud-ouest albertain et de l'ouest américain, et forme une partie d'un schéma biostratigraphique cohérent qui s'applique au Carbonifère inférieur partout dans l'ouest de l'Amérique du Nord.

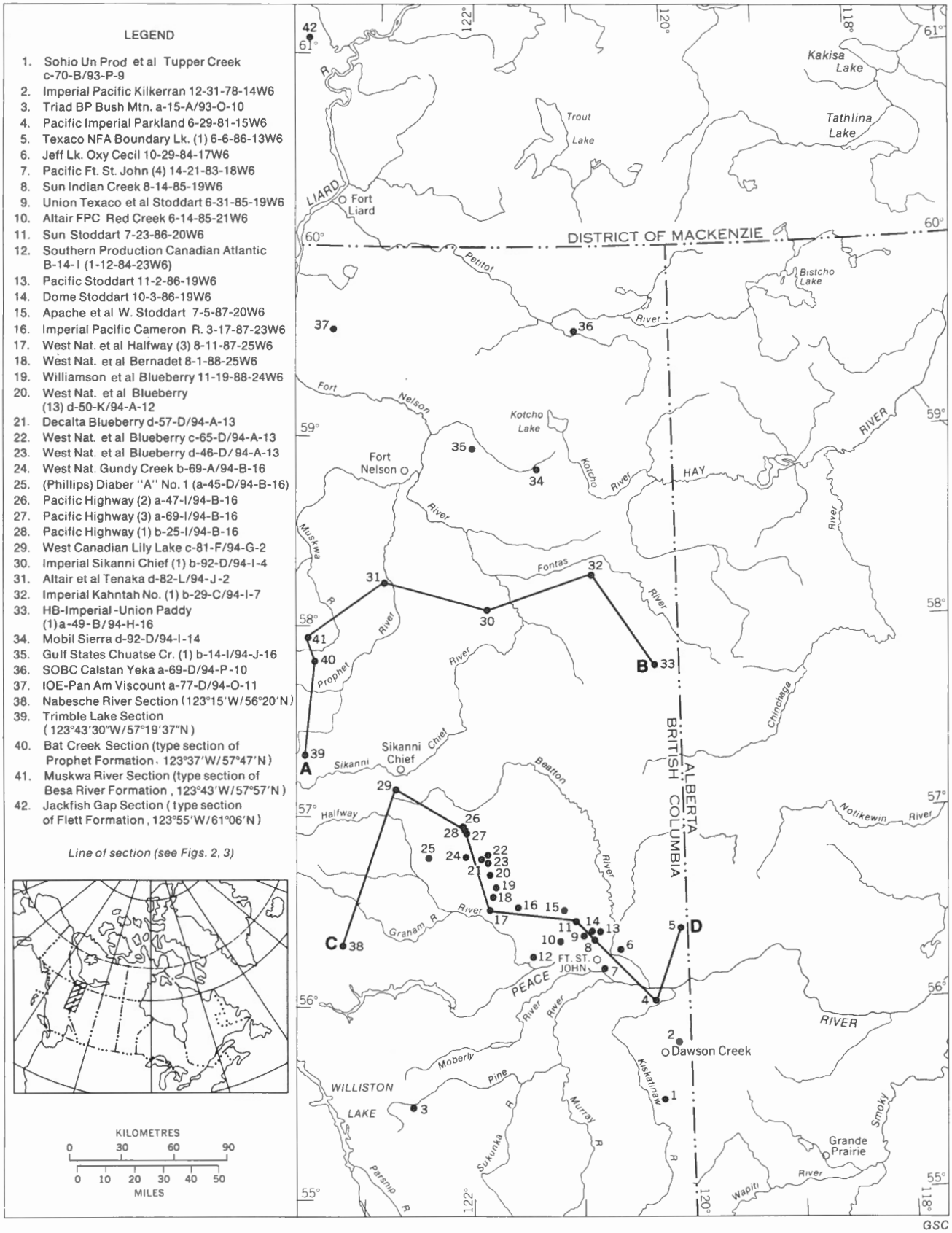

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Figure 1. Location of wells and surface sections.

Introduction

Separate stratigraphic successions of Carboniferous rocks have been established for the Foothills and Rocky Mountains of northeastern British Columbia, the adjacent plains area and the southern Mackenzie Mountains (Figs. 1, 4). Until recently, biostratigraphic data supporting correlations between these successions have been derived almost entirely from outcrop sections, with correlations between surface and subsurface based mainly on lithological comparisons. This paper presents detailed microfaunal and macrofaunal data from both subsurface cores and outcrop sections that facilitate confirmation and refinement of previously established correlations (Figs. 4, 7). It combines micropaleontology by B. L. Mamet with macropaleontology and stratigraphy by E. W. Bamber, and includes subsurface stratigraphic data compiled by R. M. Procter.

Previous work

The first detailed account of Carboniferous stratigraphy in the mountains and foothills of northeastern British Columbia was given by Sutherland (1958), who described a large fauna of Lower Carboniferous corals and introduced the name Prophet Formation for a thick sequence of cherty carbonate rocks and shale in the area between Halfway and Muskwa rivers. A thick sequence of shale, chert and cherty carbonate rocks underlying the Prophet Formation subsequently was named the Besa River Formation by Kidd (1962, 1963). This was followed by a detailed regional study of the Besa River Formation by Pelzer (1966). Hovdebo (1962) and Irish (1963, 1970) recognized the Prophet and Besa River formations to the south between Peace and Halfway rivers; they also described the overlying Paleozoic rocks, applied the names Chowade Group (Hovdebo, *ibid.*) and Stoddart Group (Irish, *ibid.*), and suggested correlations with units in the subsurface to the east. Earlier work dealing with the Carboniferous of the outcrop belt was discussed by Sutherland (1958) and Bamber *et al.* (1968).

Patton (1958), Douglas and Norris (1959), and Harker (1961, 1963) described a separate succession of upper Paleozoic rocks to the north in southeastern Yukon Territory and southwestern District of Mackenzie. Pelzer (1966) and Bamber *et al.* (1968) outlined the lateral relationships between this northern succession and those of the south, and also presented surface-to-subsurface correlations that are in general agreement with previous authors.

The early, unpublished stratigraphic nomenclature for the subsurface of northeastern British Columbia and northern Alberta was an extension of that previously established for southwestern Alberta and included the formational names Banff, Pekisko, Shunda, Turner Valley and Mount Head. In a description of the upper Paleozoic of the Peace River area, Alberta, Macauley (1958) retained the names Banff, Pekisko and Shunda but introduced the name Debolt Formation for equivalents of the Turner Valley and Mount Head formations. He correlated the Peace River succession with the Banff Formation and Rundle Group of southwestern Alberta, as did Moore (1958) in a summary paper on late Paleozoic stratigraphy in the Rocky Mountains and Foothills of Alberta. The formational names used by Macauley (1958) for northern Alberta have been adopted generally for the subsurface Carboniferous of northeastern British Columbia (Macauley *et al.*, 1964; Proctor and Macauley, 1968; Douglas *et al.*, 1970).

Rutgers (1958) used the name Stoddart Formation for terrigenous clastics and carbonates overlying the Debolt Formation in the Fort St. John area of British Columbia. The Stoddart subsequently was divided, in ascending order, into the Golata, Kiskatinaw and Taylor Flat formations by Halbertsma (1959), who also named the overlying Permian Belloy Formation. Halbertsma and Staplin (1960) assigned a Chesteran to Pennsylvanian age to the Stoddart Group and correlated it with rocks of similar age to the south, based mainly on biostratigraphic evidence from plant spores.

Ages and correlations for the Lower Carboniferous carbonate units in the area, based on micropaleontological studies, were given by Mamet and Skipp (1970). Faunal data are included in numerous other papers also, including those by Sutherland (1958), Patton (1958), Crickmay (1960), Nelson (1961), Harker (1961, 1963), Hovdebo (1962), Pelzer (1966), Bamber *et al.* (1968), Irish (1970) and Naqvi (1972).

Acknowledgments

The writers wish to express their appreciation for helpful comments by R. I. Thompson and W. W. Brideaux, who critically read this paper. J. W. Hawryszko provided data concerning the lithology and facies distribution of the Debolt Formation. Fossils from the type section of the Golata Formation were kindly provided by Imperial Oil Limited of Calgary. Personnel of the British Columbia Department of Mines and Petroleum Resources have been very helpful during several years of sampling for this paper. Their assistance in making core samples and reports available is greatly appreciated.

Stratigraphy

A thick, variable sequence of marine Tournaisian and Viséan carbonates and terrigenous clastics is present in the outcrop belt and subsurface of northeastern British Columbia and southwestern District of Mackenzie (Fig. 4). In general they are thickest in the western part of the Plains region adjacent to the Foothills belt and in the Fort St. John area on the site of the former Peace River Arch. The observed variations in thickness are the result of an initial westward depositional thickening modified by eastward bevelling during periods of late Paleozoic and Mesozoic erosion (Figs. 2, 3).

Three distinct subsurface units can be distinguished on the basis of gross lithology (Fig. 4): the calcareous shale, argillaceous carbonate rocks and less abundant fine-grained, terrigenous clastic rocks of the Banff Formation; the carbonate rocks, with less abundant shale and evaporites of the overlying Pekisko, "Shunda" and Debolt formations; and the sandstone and interbedded shale and carbonate rocks of the Stoddart Group.

A major facies change takes place toward the west, so that the entire Plains sequence of shelf carbonates passes laterally into the cherty, deeper water carbonates and shale of the outcrop belt which, in turn, pass westward into the basinal shale of the Besa River Formation (Pelzer, 1966; Bamber *et al.*, 1968; Douglas *et al.*, 1970, p. 418). The youngest carbonate and clastic units extend farthest west. The facies change begins near the western edge of the Plains where the Banff Formation passes directly into the Besa River Formation, and the Pekisko, "Shunda" and Debolt formations grade laterally into the

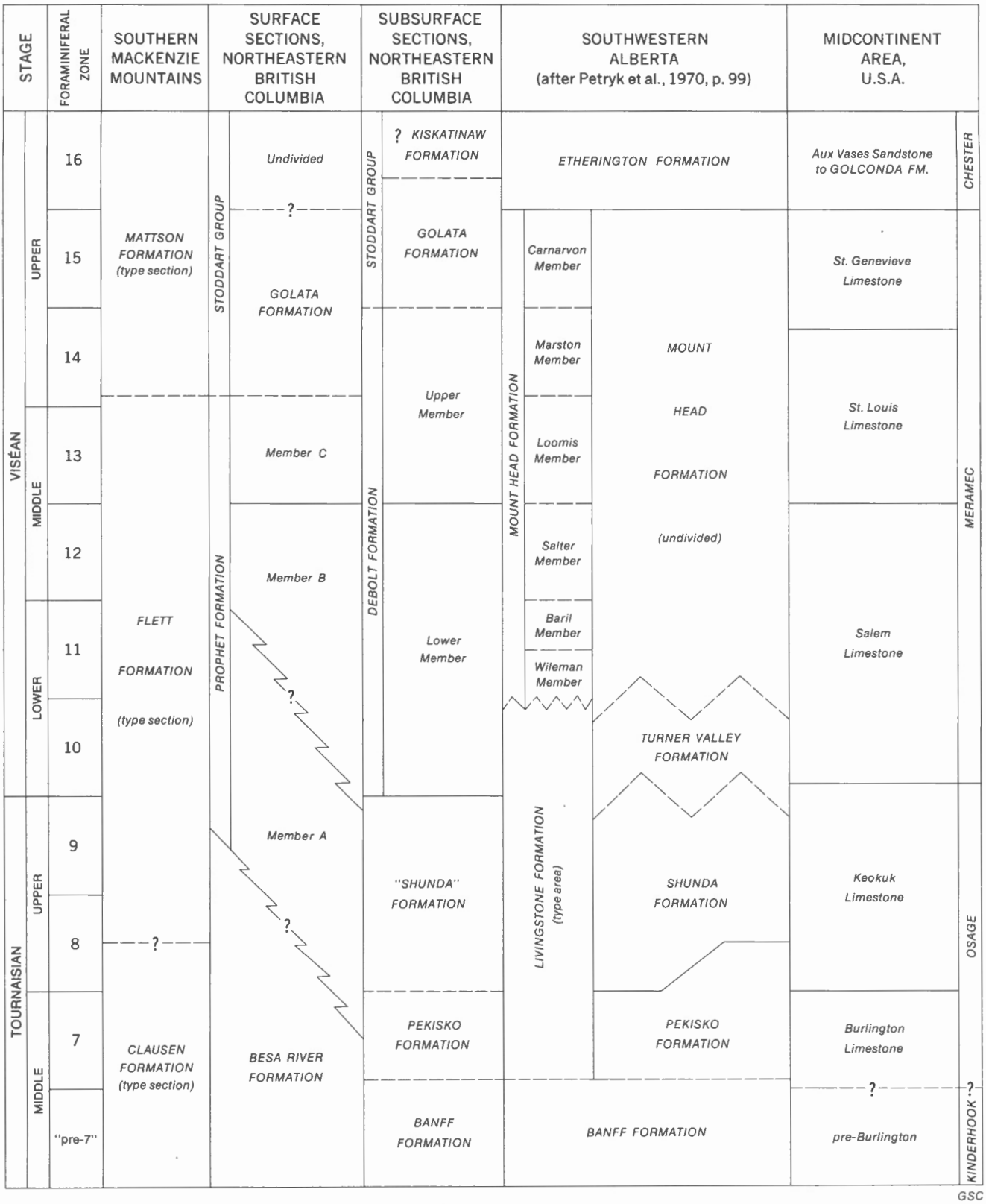

Figure 4. Correlations of formations in northeastern British Columbia, southern Mackenzie Mountains and southwestern Alberta.

Prophet Formation. A further change occurs in the outcrop belt, from carbonate rocks and chert of the Prophet Formation in the east to laterally equivalent shale and mudstone of the Besa River Formation in the west. The clastic rocks of the Stoddart Group extend farthest west into the outcrop belt, where they also change facies westward into the Besa River Formation beyond the western limits of the Prophet Formation. The trend of these facies belts is oblique to the disturbed belt, with the result that the major facies changes take place in the westernmost Plains to the north and in the disturbed belt to the south. Similar east-west facies relationships exist in the southern District of Mackenzie and southeastern Yukon Territory (Harker, 1963; Pelzer, 1966; Bamber *et al.*, 1968).

A more detailed account of the distribution, thickness, lithology, facies relationships and age follows for each of the stratigraphic units dealt with here. Much of the data presented is derived from previous publications. In particular, the reader is referred to Macauley *et al.* (1964) for subsurface thickness and distribution data.

Banff Formation

Type section. Mount Rundle, Alberta (Kindle, 1924).

Lithology. In northeastern British Columbia subsurface, the Banff Formation comprises a lower unit consisting mainly of dark grey shale with minor amounts of carbonate, overlain by an upper, more calcareous unit of siltstone, shale and argillaceous limestone.

Distribution and thickness. The formation is present throughout all but the most westerly part of the subsurface of the area and may exist in surface sections of the southern Liard Range in the District of Mackenzie. The thickness ranges from 800 to 1000 ft (244–305 m) in the east and increases toward the west to more than 1250 ft (381.2 m) along the margin of the disturbed belt.

Stratigraphic relations and facies variation. Beneath the Banff Formation is the thin, widespread, dark brownish grey and black, silty, bituminous shale and calcareous siltstone of the Exshaw Formation, which is easily recognized on radioactivity well logs by its gamma ray character. The Banff is overlain in the subsurface by the Pekisko Formation, where the latter is developed in southeastern and northeastern parts of the area (Macauley *et al.*, 1964, p. 96), and by the shale succession of the "Shunda" Formation where the Pekisko is absent because of facies change (*ibid.*). Toward the west, the Banff Formation changes facies into the dark grey, silica-rich shale and cherty carbonate of the Besa River Formation and its northern equivalents along a north-south line approximately at latitude 123°W (Bamber *et al.*, 1968, p. 5; Macauley *et al.*, 1964, p. 97).

Age. Early and Middle Tournaisian. The Devonian-Carboniferous boundary is probably within the underlying Exshaw Formation, based on determinations to the south (Macqueen and Sandberg, 1970). Middle Tournaisian foraminifers and brachiopods (Appendix; Figs. 2, 3, 6, 7) are present in the upper part of the Banff Formation.

Pekisko Formation

Type section. Anglo Canadian Devonian test well (2-25-19-3W5) between depths of 7870 and 8370 ft (2400.3–2552.8 m), Turner Valley field, Alberta (Douglas, 1958, p. 39).

Lithology. The Pekisko within the study-area consists mainly of skeletal limestone and wackestone; minor amounts of interbedded shale and argillaceous limestone increase in proportion laterally toward the carbonate-shale facies transition between the Pekisko and the "Shunda" formations (Macauley *et al.*, 1964, p. 96, 97).

Distribution and thickness. The development of the Pekisko is limited to the extreme northeastern and southeastern parts of the area (*ibid.*, p. 96). The thickness is variable but is commonly less than 250 ft (76.2 m) and decreases toward the carbonate-shale transition.

Stratigraphic relationships and facies variation. Carbonates of the Pekisko Formation interfinger with, and pass laterally into, shale and argillaceous limestone of the "Shunda" facies (*ibid.*, p. 96, 97) toward the Fort St. John area.

Age. Middle Tournaisian foraminifers (Zone 7) occur in the lower part of the Pekisko (Appendix; Figs. 2, 6, 7; Mamet and Skipp, 1970, p. 340). The upper age limit is not known precisely.

"Shunda" Formation

Type section of Shunda Formation. Shunda Creek, near Nordegg, Alberta (Stearn, 1956).

Lithology. In the study-area, the "Shunda" consists of fine-grained, argillaceous limestone interbedded with calcareous shale, dolomite, skeletal limestone and lesser amounts of pelletoid limestone and siltstone. Shale and argillaceous limestone increase in proportion toward the west and into the Fort St. John area, as shown by Macauley *et al.* (1964, p. 96, 97). This western, open-marine facies differs from the Shunda to the south (southern and west-central Alberta and Narraway River–Kakwa Lake area of British Columbia), where the unit is a restricted marine facies dominated by pelletoid and birdseye micritic limestone, microcrystalline to finely crystalline dolomite, and solution breccia, and lesser amounts of argillaceous limestone and skeletal limestone.

Distribution and thickness. The "Shunda" is present throughout the subsurface of the area, except to the northeast where it has been removed beneath the sub-Mesozoic disconformity (*ibid.*, p. 96), and in the westernmost subsurface where it undergoes a facies transition into the Besa River Formation. Thicknesses are generally 250 to 400 ft (76.2–122 m) where the Pekisko Formation is present, and increase to 500 to 600 ft (152.5–183 m) toward the Fort St. John area beyond the limits of the Pekisko Formation (*ibid.*).

Stratigraphic relationships and facies variation. Beyond the Pekisko carbonate development in the Fort St. John area, and to the north and west (*ibid.*, p. 96, 97), the "Shunda" Formation occupies the entire interval between the Banff Formation and the Debolt Formation and is, in part, laterally equivalent to the Pekisko Formation (Figs. 2, 3). This expanded "Shunda" passes westward into the Besa River Formation and Member A of the Prophet Formation approximately at longitude 123°30′W (Bamber *et al.*, 1968, p. 5; Pelzer, 1966, Fig. 11, p. 301, 302) and is equivalent to the upper Clausen and lower Flett formations of the southwestern District of Mackenzie. As noted above, there is a marked difference between the lithology of the northern and western "Shunda" in northeastern

British Columbia and that of the Shunda to the south. These two facies should not be included in the same formation. They are separated laterally, at least in surface sections of the southern Monkman Pass area (Bamber and Macqueen, 1971, p. 193), by a contemporaneous development of coarse-grained skeletal limestone and dolomite, but the extent of this carbonate bank facies into the subsurface has not been determined. No revision of the stratigraphic nomenclature for this interval has been attempted here. The term "Shunda", in quotation marks, is used for the northern and western open-marine equivalents of the Shunda Formation.

Age. Late Tournaisian foraminifers (Zones 8, 9), brachiopods and corals occur in the "Shunda" (Appendix; Figs. 2, 3, 6, 7; Mamet and Skipp, 1970, p. 340). Spores and ostracodes indicate that the Tournaisian-Viséan (Osage-Meramec) boundary is near the top of the unit in the area near the "Shunda"–Besa River transition (Pelzer, 1966, p. 275, 299). The precise age of the Pekisko-"Shunda" boundary is unknown.

Debolt Formation

Type section. Amerada Crown GF23-11 (6-11-73-26W5), between the depths of 6212 and 7014 ft (1894.7–2139.3 m), Peace River area near Debolt, Alberta (Macauley, 1958, p. 298).

Lithology. The Debolt Formation has been divided informally by Macauley (*ibid.*) into a lower and an upper member.

In its type area, the *lower Debolt* consists mainly of cherty, skeletal limestone and wackestone with less calcareous shale and finely crystalline dolomite. Within the study-area, this member comprises mainly lump-bearing skeletal limestone, wackestone and micritic limestone in fairly thick units separated by intervals of calcareous shale and argillaceous limestone. The proportion of argillaceous rocks is greatest in the basal part and the upper two thirds of the member, and increases in the member as a whole toward the northwest. Westward toward the Foothills, there is an increase in chert and dolomite as the lower Debolt passes laterally into Member B of the Prophet Formation. Dolomitization of the lower Debolt carbonates occurs locally, particularly where it subcrops at the sub-Mesozoic unconformity in the northeastern part of the area.

The *upper Debolt*, in its type area near Debolt, Alberta, is mainly microcrystalline to finely crystalline dolomite with some anhydrite and micritic limestone. This is not true in northeastern British Columbia, however; there it is dominantly limestone with relatively less dolomite and shale. The lower third of the member consists of dark grey, argillaceous, micritic limestone and calcareous shale with some pelletoid limestone. This is overlain by several hundred feet of lump-bearing skeletal and pelletoid limestone containing very little argillaceous material. Skeletal limestone is less abundant in the upper 50 to 150 ft (15.2–45.7 m) of the member, which consist mainly of micritic limestone that is partly lump-bearing and pelletoid. A thin unit of echinoderm limestone caps the formation over much of the area. Oolites are common in the middle and upper parts of the upper member, particularly to the west near the Foothills. Where it subcrops at the sub-Mesozoic unconformity to the northeast, the upper Debolt commonly is dolomitized and silicified, especially in its middle part.

Distribution and thickness. The lower and upper members are present throughout the subsurface of the area, except in the northeast beyond their respective erosional limits as shown by Macauley *et al.* (1964, p. 96). Maximum total thickness of approximately 1200 ft (366 m) for the lower and upper Debolt is in the southwestern part of the subsurface area. The formation thins toward the northeast, mainly as a result of erosion prior to or during the development of the sub-Mesozoic unconformity.

Stratigraphic relationships and facies variation. The shale and argillaceous carbonate of the underlying "Shunda" Formation grade upward into the argillaceous carbonate generally found in the lowermost Debolt. The upper contact with the Golata Formation of the Stoddart Group generally is gradational and apparently conformable (Macauley, 1958, p. 301; Macauley *et al.*, 1964, p. 100), but locally there is evidence of erosion at this contact in the type-area in Alberta (Halbertsma, 1959, p. 113). In the northeastern part of the area, the Stoddart Group has been removed beneath the sub-Permian and sub-Triassic unconformities (Macauley *et al.*, 1964, p. 99). As a result, the Debolt is overlain in this area by the Permian Belloy Formation or, where the latter has been eroded (*ibid.*, p. 89), by Triassic rocks (Figs. 2, 3). The Debolt Formation has been truncated so that progressively older units within it underlie the sub-Permian and sub-Mesozoic unconformities from southwest to northeast. Erosion of the Debolt is indicated by the presence of Late Viséan foraminifers (Zones 14 and 15) in chert pebbles within the basal Belloy Formation (Appendix, locs. 6, 8–11, 13–15). Erosional limits for the lower and upper members are shown by Macauley *et al.* (*ibid.*, p. 96).

Correlation between the Debolt and Prophet formations of the disturbed belt has been demonstrated by numerous authors (Macauley *et al.*, 1964, p. 97, 98; Hovdebo, 1962, p. 95; Pelzer, 1966, p. 275, 306; Bamber *et al.*, 1968, p. 8, 13, Fig. 2; Irish, 1970, p. 45; Mamet and Skipp, 1970, p. 340).

The lower Debolt passes westward into the cherty, spicular carbonates of Member B of the Prophet Formation and northwestward into the carbonates and calcareous shale of the middle part of the Flett Formation. The Turner Valley Formation of western Alberta, which extends northwestward into the Monkman Pass area south of the study-area (Bamber and Macqueen, 1971, p. 194), is continuous with the lower Debolt (Procter and Macauley, 1968, Fig. 2, p. 1958) and is the same age as the lower part of that unit. Age equivalents of the upper part of the lower Debolt include the Wileman, Baril and Salter members of the Mount Head Formation in southwestern Alberta (Fig. 4) and probably "Formation D" of the Rundle Group in the Jasper area (Mountjoy, 1962, p. 33).

The upper Debolt is equivalent to, and continuous with, Member C and the upper part of Member B of the Prophet Formation, and the upper part of the Flett Formation. Rocks of this age occur in the upper Mount Head Formation (Loomis and lower Marston members) but have been removed beneath the sub-Permian unconformity from the Jasper-Edson area northwest to the Pine Pass area.

Age. A Meramecian age has been assigned to the Debolt Formation by several authors (Macauley *et al.*, 1964, p. 98; Pelzer, 1966, p. 275; Bamber *et al.*, 1968, p. 8; Procter and Macauley, 1968, p. 1959). Foraminifers, corals and brachio-

pods of Early, Middle and Late Viséan age are widespread in the formation (Appendix—foraminiferal zones 10–12 [lower Debolt] and 13, 14 [upper Debolt]; Mamet and Skipp, 1970, p. 340).

Stoddart Group

Type section originally designated for Stoddart Formation. Pacific Fort St. John (23) 3-29-83-18W6, between the depths of 6635 and 8795 ft (2023.7–2682.5 m), Fort St. John gas field, British Columbia (Rutgers, 1958); same type section subsequently designated by Halbertsma (1959) for the Kiskatinaw Formation, between depths 7555 and 8526 ft (2304.3–2600.4 m), and the Taylor Flat Formation, between depths 6630 and 7555 ft (2022.1–2304.3 m); type section for the Golata Formation designated by Halbertsma (*ibid.*) as Imperial Belloy #12-14 (12-14-78-1W6) between depths 4338 and 4512 ft (1323.1–1376.2 m), Peace River area, Alberta.

In this report, the Stoddart Group is dealt with only generally. It is a succession of terrigenous clastics and carbonates that is divided, in ascending order, into the Golata, Kiskatinaw and Taylor Flat formations (*ibid.*). The Golata Formation is a variable unit consisting mainly of shale and interbedded argillaceous limestone and sandstone. Coal and anhydrite are developed locally in Alberta east of the study-area. The Kiskatinaw Formation is dominantly quartz sandstone with interbedded variegated and dark grey shale and rare carbonate beds. It shows marked lateral facies variations and has diachronous upper and lower contacts (Macauley *et al.*, 1964, p. 100). The Taylor Flat Formation is composed mainly of limestone and dolomite with sandstone beds that locally become sufficiently abundant to cause difficulty in distinguishing the Taylor Flat Formation from the clastic rocks of the Kiskatinaw Formation. The distribution and thickness of the Stoddart are shown by Macauley *et al.* (*ibid.*, p. 99), who stress the lithologic variability of this succession and indicate that the above-mentioned units represent diachronous facies that are not mappable as formations (*ibid.*, p. 100). According to these authors, no major unconformities occur within the Stoddart. Local or regional unconformities have been indicated by other authors at the Golata-Kiskatinaw contact, within the Kiskatinaw and at the Kiskatinaw–Taylor Flat boundary (Sikabonyi and Rodgers, 1959, p. 207–209; Halbertsma and Staplin, 1960, p. 368–372). Evidence of unconformable relationships low in the Stoddart, on a local scale at least, is provided by the presence of fossiliferous, reworked chert pebbles of Middle Late Viséan age (foraminiferal zone 15) in a Late Viséan (foraminiferal zone 16) sandstone and limestone unit 6 ft (1.83 m) below the Permian Belloy Formation within the lower Kiskatinaw or upper Golata of the Sun Stoddart 7-23-86-20W6 well at a depth of 6336 ft (1932.5 m) (Appendix, loc. 11; Fig. 3). The lateral extent of this chert pebble occurrence is unknown.

The Stoddart Group outcrops in the disturbed belt between Pine Pass and southern Yukon. It passes westward into the Besa River Formation within the outcrop belt and grades northward into the relatively coarse grained, partly continental clastics of the Mattson Formation (Hovdebo, 1962; Irish, 1963, 1970; Bamber *et al.*, 1968; McGugan, 1967). Erosion prior to deposition of the Permian Kindle and Belcourt formations has truncated the Stoddart Group toward the south, so that rocks of Permian age rest directly on Lower Middle Viséan carbonate rocks over much of the area between Pine Pass and North Saskatchewan River. Terrigenous clastics and carbonates of the Etherington Formation (Douglas, 1958; Mamet, 1968) south of this area are equivalent to the Stoddart Group.

Age. There is little biostratigraphic data for the Stoddart Group. On the basis of spores and rare macrofaunal occurrences, a Chesteran (Late Viséan) age has been assigned to the Golata and Kiskatinaw Formations, and a Pennsylvanian age has been assigned to the Taylor Flat Formation (Halbertsma, 1959, p. 114; Halbertsma and Staplin, 1960, p. 368–372; Staplin, 1960; Hovdebo, 1962; Irish, 1963; Naqvi, 1972, p. 82–84; Macauley *et al.*, 1964, p. 100). In the Nabesche River Section (Appendix, loc. 38; Fig. 3), early Late Viséan corals (equivalent in age to the upper Meramec) occur within the lower Golata Formation 239 ft (72.9 m) above the top of the Prophet Formation. A fauna of brachiopods, corals and bryozoans, identified by C. H. Crickmay, from the lower part of the type section of the Golata Formation (Imperial Belloy #12–14, depth 4493 ft [1370.4 m]) was assigned a Chesteran age and the Golata was equated with the lower Etherington Formation of southwestern Alberta (Halbertsma, 1959, p. 114; Staplin, 1960). Corals from this fauna have been restudied by Bamber for this paper and suggest equivalence with the upper Meramec, rather than the Chester. They include forms closely allied with the genus *Ekvasophyllum* that occur in Meramec equivalents within the upper Mount Head Formation of southwestern Alberta, but do not occur in Chester equivalents within the overlying Etherington Formation. Foraminifers found with this fauna are assigned a Middle Late Viséan age (foraminiferal zone 15, uppermost Meramec equivalents) by Mamet. A Chesteran age was assigned by Halbertsma (1959) and Staplin (1960) to spores from the type Golata that occur mainly above the level of the faunal occurrence. As stated above, Late Late Viséan foraminifers (Zone 16) occur in the lower Stoddart 6 ft (1.8 m) below its erosional contact with the Permian Belloy Formation in the Sun Stoddart 7-23-86-20W6 well (loc. 11). A brachiopod fauna of late Late Viséan (Chester) age was found at a depth of 6842 ft (2086.8 m) in the Southern Production Canadian Atlantic B-14-I well (Appendix, loc. 12). The position of this fauna within the Stoddart is not known. Brachiopods of probable late Late Viséan (Chester) age occur 86 ft (26.2 m) below the top of the Taylor Flat Formation, at a depth of 6591 ft (2010.3 m) in the Pacific Fort St. John (4) 14-21-83-18W6 well (Appendix, loc. 7).

Besa River Formation

The Besa River Formation is a thick sequence of dark grey to black quartzose shale with abundant sponge spicules and radiolarians. Thin argillaceous, chert-rich carbonate beds are present also, especially in the upper part of the unit. This unit contains the western equivalents of the Devonian to Upper Viséan carbonates of the subsurface and eastern outcrop belt. Its upper and lower contacts are diachronous, and there is a rapid westward increase in the stratigraphic range of the formation caused by a facies change from carbonate to shale.

Only the type section of the Besa River Formation is included in this study (Appendix, loc. 41, Muskwa River section;

Kidd, 1962, 1963). There, the formation is more than 2400 ft (732 m) thick (base not exposed). The upper 1475 ft (449.9 m) of the section are dominated by silty, calcareous and dolomitic shale with thin beds of limestone and spiculite increasing in abundance toward the top. Radiolarians are found near the base of this interval. An underlying unit of cherty, silty shale weathering yellow, orange-brown and dark reddish brown, between 1475 and 1538 ft (449.9–469.1 m) below the top, is equivalent to the Exshaw Formation (Pelzer, 1966, p. 302). Below the Exshaw equivalents the shale is only slightly calcareous and limestone beds are rare. Pelzer (1966) and Bamber *et al.* (1968) describe the regional aspects of the lithology, thickness, distribution and facies relationships of the formation.

The following fossils in the Besa River Formation range in age from Middle Devonian to Late Viséan: Middle Devonian brachiopods in basal beds transitional with the Dunedin Formation (Kidd, 1963, p. 372; Taylor and MacKenzie, 1970, p. 16); Late Devonian conodonts, ostracodes, foraminifers, brachiopods and tentaculitids (Kidd, 1963, p. 372; Bamber *et al.*, 1968, p. 6; Taylor and MacKenzie, 1970, p. 17); Tournaisian brachiopods (Appendix, loc. 41; Kidd, 1963, p. 372; Bamber *et al.*, 1968, p. 6), ostracodes and spores (Pelzer, 1966, p. 299); Viséan ammonoids and spores (Bamber *et al.*, 1968, p. 6; Pelzer, 1966, p. 298, 299).

Prophet Formation

Type section. Bat Creek, approximately 6 mi (9.6 km) south of Muskwa River, Trutch map-sheet (NTS 94G), 57°47′N, 123°37′W (Sutherland, 1958, p. 25–27; Appendix, loc. 40).

Lithology. The Prophet Formation consists mainly of limestone, dolomite and chert, and is divided into Members A, B and C, in ascending order (Sutherland, *ibid.*). These members are well developed in the eastern part of the outcrop belt, including the type section (Fig. 8). Their main lithological characteristics are summarized below.

Member A, which is gradational with the underlying Besa River Formation, consists of dark grey and orange-weathering, silicified spiculite, radiolarite and wackestone alternating with partly calcareous shale, argillaceous wackestone and minor amounts of siltstone. The shale in the lower part of the member is less calcareous and more abundant than in the upper part.

Member B is a light and dark grey, banded, cliff-forming unit consisting of skeletal limestone, wackestone and lime-mudstone, with numerous thick units of dolomite. The carbonate rocks are commonly silicified, with the result that chert is abundant throughout the member. Wackestone and dolomite are most abundant in the lower part of Member B.

Member C is a thin, light grey to light brown weathering, slightly recessive succession at the top of the Prophet Formation, consisting of skeletal limestone with some beds of wackestone. Silicification is common, and pellets are abundant locally.

Distribution and thickness. The Prophet Formation is present in the Foothills from the vicinity of the Alaska Highway west of Fort Nelson (Bamber *et al.*, 1968, p. 6) south to the Pine Pass area (Taylor and Bamber, 1970, p. 54, 55). It has been recognized also in several of the Foothills wells in the northern part of the area (Macauley *et al.*, 1964, p. 97; Bamber *et al.*, 1968, p. 6). The Prophet Formation is thickest in the Halfway River map-area (Irish, 1970) west of Fort St. John, where it reaches more than 3600 ft (1098 m) (Appendix, loc. 38). North and south of this area, in more easterly sections, the thickness ranges from approximately 800 to 1400 ft (244–427 m). Member B is generally much thicker than the other two members. The formation thins progressively westward as it changes facies into the laterally equivalent Besa River Formation (*see* below). More detailed distribution and thickness data for the Prophet Formation are given by Bamber *et al.* (1968, p. 6, 22, 24), Irish (1970) and Sutherland (1958).

Stratigraphic relationships and facies variation. The contact between Member A of the Prophet Formation and the underlying shale of the Besa River Formation is gradational. In general, Member C is overlain conformably by the Golata Formation in eastern sections and by the Besa River Formation in westernmost sections. Locally, however, it is overlain disconformably by Permian and Triassic rocks (Bamber *et al.*, 1968, p. 9, Fig. 2; Sutherland, 1958, p. 19).

Facies relationships between the Prophet Formation and its correlatives, the "Shunda" and Debolt formations of the subsurface to the east, are discussed above. A westward lateral facies change takes place from the chert and carbonate rocks of the Prophet Formation to the shale of the Besa River Formation, beginning with Member A in the east and progressing upward through Members B and C toward the west (Bamber *et al.*, 1968, p. 8; Pelzer, 1966, Fig. 6). This is accompanied by a change in the composition of the Prophet carbonates, which show a westward increase in spicules, argillaceous material and interbedded shale, and a corresponding decrease in skeletal limestone.

The Prophet Formation is correlative with the Flett Formation and the upper part of the Clausen Formation to the north, and with the middle part of the Rundle Group to the south (Fig. 4; Sutherland, 1958, p. 27; Bamber *et al.*, 1968, p.8; Irish, 1970).

Age. Members B and C of the Prophet Formation, which are abundantly fossiliferous locally, have been equated with the Osage and Meramec by numerous authors (Sutherland, 1958; Nelson, 1961; Hovdebo, 1962; Bamber *et al.*, 1968; Irish, 1970; and others), mainly on the basis of coral and brachiopod determinations. Several sections (Appendix, locs. 38–40; Mamet and Skipp, 1970, p. 340; Mamet, 1976) have yielded rich microfaunal and coral assemblages indicating a latest Tournaisian to Early Late Viséan age for Members B and C. Member A has yielded rare, poorly preserved brachiopods and corals that suggest a Tournaisian age (Sutherland, 1958, p. 25) in sections to the east. In more westerly sections, however, such as locality 38, which is near the western limit of the Prophet Formation, the uppermost part of Member A is Middle Viséan (foraminiferal zone 12?, Appendix; Fig. 3). Thus, as a result of the facies changes described above, the contact between Members A and B becomes younger as the Prophet Formation passes westward into the Besa River Formation. The same appears true of the contact between Members B and C (Figs. 2, 3).

Flett Formation

Only the type section of the Flett Formation is included in this study (Appendix, loc. 42, Jackfish Gap Section; Fig. 9;

Harker, 1963, p. 10, 33–37). In that section, the formation is approximately 1450 ft (442.3 m) thick and consists of medium to dark grey limestone, calcareous shale and sandstone. Shale dominates the lower 300 ft (91.5 m) of the section and becomes less abundant toward the top as the amount of limestone increases. Spiculite also occurs in the lower 250 ft (76.3 m). Several units of siltstone and fine-grained sandstone between 700 and 1100 ft (213.5–335.5 m) above the base are up to 45 ft (13.7 m) thick. The carbonates in the lower 676 ft (206.2 m) of the section are mainly wackestone with rare lime-mudstone and skeletal limestone. Above this, the carbonates are dominated by packstone containing abundant pelmatozoan and bryozoan fragments and an increasing number of foraminifers toward the top. The upper 40 ft (12.2 m) contain dolomite.

The Flett Formation passes laterally into the shale of the Besa River Formation (=Etanda Formation of Harker, 1963; Douglas *et al.*, 1970, p. 418) toward the west and into the carbonates of the Prophet and Debolt formations to the south and southeast (Douglas and Norris, 1959, p. 9; Harker, 1961, p. 7, 1963, p. 5; Bamber *et al.*, 1968, p. 8). Little is known about facies variations within the Flett Formation.

A large fauna consisting mainly of brachiopods, corals and ostracodes has been reported from the Flett Formation by Patton (1958, p. 312–319, unit 3) and Harker (1963, p. 11–16). The formation was assigned a Kinderhookian to ? Meramecian age by Patton (*ibid.*) and a Kinderhookian or Osagean to Chesteran age by Harker (*ibid.*, p. 15). Sutherland (1958, p. 34, 35, composite section 11, units 4 to 6) assigned a Meramecian age to corals and brachiopods from the Flett Formation at various locations in the southern Mackenzie Mountains. The microfauna of the type section (Appendix, loc. 42; Mamet and Skipp, 1970, p. 338–340) and associated corals and brachiopods indicate a Late Tournaisian to Middle or early Late Viséan age (upper Osage to upper Meramec equivalents). Coral species found in the upper 106 ft (32.3 m) also occur in the uppermost parts of the Debolt and Prophet formations to the south (Bamber *et al.*, 1968, p. 8).

Biostratigraphy

Carboniferous fossils identified by the authors from the study-area range in age from Middle Tournaisian to Late Viséan (Figs. 5, 6, 7). Pennsylvanian spores are reported by Halbertsma and Staplin (1960) from the upper part of the section in the subsurface. The most abundantly fossiliferous rocks are the carbonates of the "Shunda", Debolt, Prophet and Flett formations, of Late Tournaisian to Early Late Viséan age. Foraminifers, corals and brachiopods dominate the fauna. Other, less abundant groups, such as bryozoans, gastropods and pelecypods, have not been studied for this paper. There is a marked increase in faunal abundance and diversity toward the top of the carbonate succession, followed by a sharp decrease at the base of the overlying terrigenous clastic strata of the Stoddart Group and Mattson Formation.

The main conclusions of this study are shown on Figures 4 and 7, which present the relationships between the microfaunal zonation, the vertical distribution of the macrofauna, the lithostratigraphic units described above, and standard successions elsewhere in North America and Europe. Faunal occurrences are listed in the appendix for each well and surface stratigraphic section studied. Correlations with the Lower Carboniferous succession of Europe and the standard Mississippian succession of North America are based on microfaunal data (Fig. 4). A summary of the age and faunal content, as determined by the authors and reported in the literature, is given for each stratigraphic unit in the foregoing section dealing with stratigraphy.

Major elements of the microbiota

Eleven foraminiferal zones, ranging in age from Middle Tournaisian to Late Viséan, can be recognized within the Lower Carboniferous of the area (Figs. 5, 6). These zones are characterized by the microbiota listed below. They correspond to zones previously established for the North American Cordillera (Mamet and Skipp, 1970), which can be correlated with zones of the original Lower Carboniferous stratigraphic sequence of Eurasia.

Zone "pre-7"
- *Bisphaera* sp.
- *Brunsiina* sp.
- *Calcisphaera laevis* Williamson
- *Earlandia* sp.
- *Earlandia elegans* (Rauzer-Chernoussova)
- *Earlandia minima* (Birina)
- *Girvanella* sp.
- *Latiendothyra* sp.
- *Latiendothyra* of the group *L. parakosvensis* (Lipina)
- *Parathurammina* sp.
- *Septabrunsiina* sp.
- *Septaglomospiranella* sp.
- *Septaglomospiranella granulosa* (Zeller)
- *Septatournayella* sp.
- *Umbellina* sp.

Zone 7
- *Bisphaera* sp.
- *Calcisphaera laevis* Williamson
- cf. *Chernyshinella* sp.
- *Earlandia* sp.
- *Earlandia elegans* (Rauzer-Chernoussova)
- *Earlandia minima* (Birina)
- *Latiendothyra* sp.
- *Palaeospiroplectammina chernyshinensis* (Lipina)
- *Parathurammina* sp.
- *Radiosphaerina* sp.
- *Rectoseptaglomospiranella nalivkini* (Malakhova)
- *Septaglomospiranella* sp.
- *Septaglomospiranella primaeva* (Chernysheva)

Zone 8
- *Calcisphaera laevis* Williamson
- *Earlandia elegans* (Rauzer-Chernoussova)
- cf. *Irregularina* (*Paracalligelloides*? sp.)
- *Latiendothyra* sp.
- *Latiendothyra* of the group *L. latispiralis* (Lipina)
- *Latiendothyra* of the group *L. parakosvensis* (Lipina)
- *Parathurammina* sp.
- *Parathurammina* of the group *P. cushmani* Suleimanov
- *Parathurammina* of the group *P. paracushmani* Reitlinger
- *Parathurammina* of the group *P. suleimanovi* Lipina

FORAMINIFERAL ZONE
AGE
DISTRIBUTION OF TAXA
"pre-7"
7
8
9
10
11
12
13
14
15
16 undifferentiated
MIDDLE TOURNAISIAN
LATE TOURNAISIAN
EARLY VISÉAN
MIDDLE VISÉAN
LATE VISÉAN (PARS)
1 Bisphaera sp.
2 Brunsiina sp.
3 Calcisphaera sp.
4 Calcisphaera laevis Williamson
5 cf. Caligella ? sp. (Caligelloides sp.)
6 Earlandia sp.
7 Earlandia elegans (Rauzer-Chernoussova)
8 Earlandia minima (Birina)
9 Girvanella sp.
10 Latiendothyra sp.
11 Latiendothyra of the group L. parakosvensis (Lipina)
12 Parathurammina sp. and Vicinesphaera sp.
13 Parathurammina of the group P. cushmani Suleimanov
14 Septabrunsiina sp.
15 Septaglomospiranella sp.
16 Septaglomospiranella primaeva (Chernysheva)
17 Septatournayella sp.
18 Umbellina sp.
19 Palaeospiroplectammina chernyshinensis (Lipina)
20 Radiosphaerina sp.
21 Rectoseptaglomospiranella sp.
22 Earlandia clavatula (Howchin)
23 cf. Irregularina ? sp.
24 Latiendothyra latispiralis (Lipina)
25 Latiendothyra of the group L. latispiralis (Lipina)
26 Parathurammina of the group P. paracushmani Reitlinger
27 Parathurammina of the group P. suleimanovi Lipina
28 Septaglomospiranella dainae Lipina
29 Spinoendothyra sp.
30 Tournayella sp.
31 Tuberendothyra sp.
32 Tuberendothyra tuberculata (Lipina) and Tuberendothyra safanovae (Skipp)
33 Calcisphaera aff. C. pachysphaerica (Pronina)
34 Calcisphaera pachysphaerica (Pronina)
35 Carbonella sp.
36 Pseudoammodiscus sp.
37 Diplosphaerina sp.
38 Diplosphaerina of the group D. inaequalis (Derville)
39 Earlandia of the group E. vulgaris (Rauzer-Chernoussova and Reitlinger)

GSC

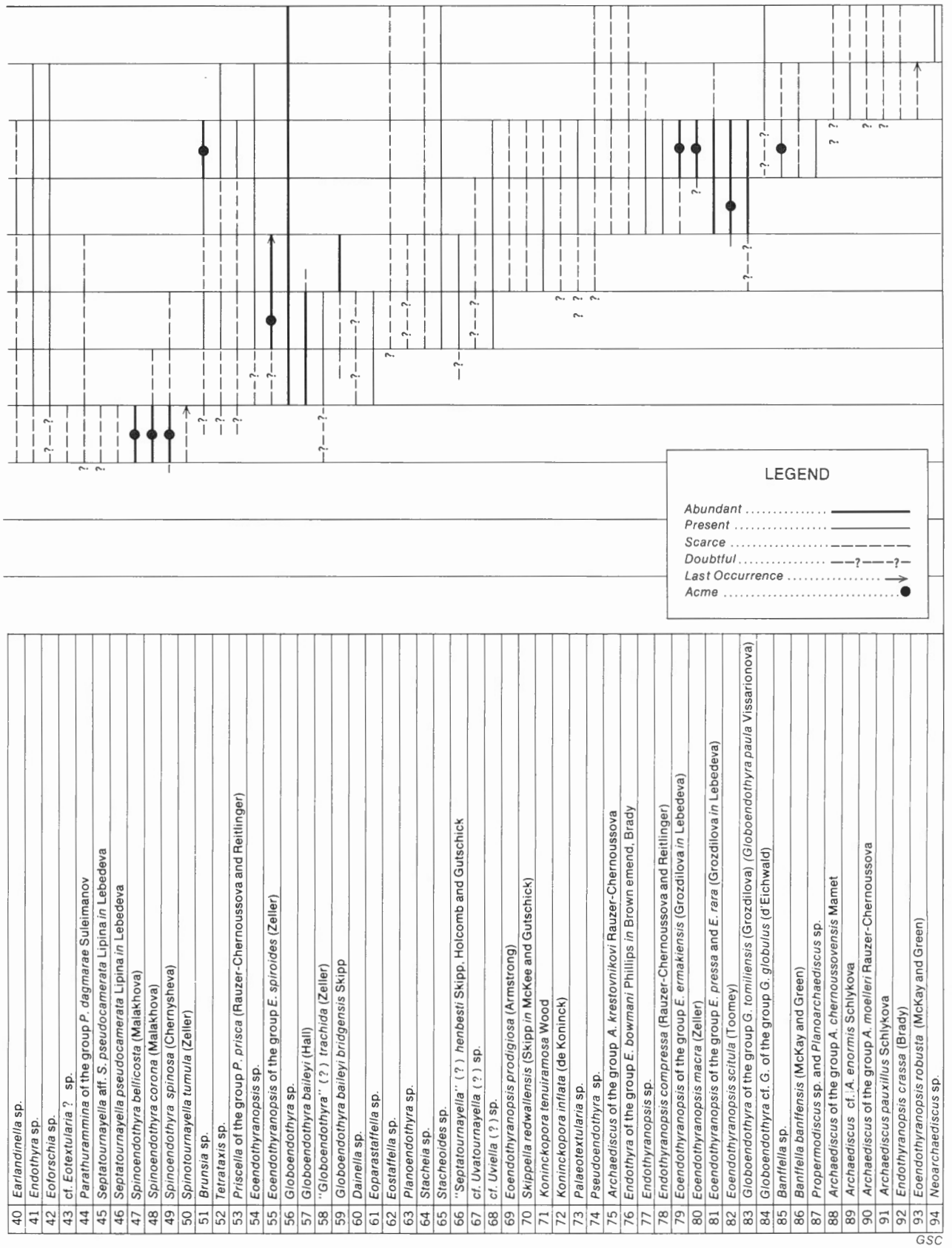

Figure 5. Zonal distribution of major elements of Lower Carboniferous microbiota in northeastern British Columbia.

Septabrunsiina sp.
Septaglomospiranella dainae Lipina
Septatournayella pseudocamerata Lipina *in* Lebedeva (very scarce)
Spinoendothyra sp. (scarce)
Tournayella sp.
Tuberendothyra sp.
Tuberendothyra tuberculata (Lipina) (abundant)
Vicinesphaera sp.

Zone 9
Brunsiina sp.
Calcisphaera sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
Carbonella sp.
Diplosphaerina sp.
Earlandia sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Earlandinella sp.
Endothyra sp.
Eoforschia sp.
cf. *Eotextularia*? sp.
Eotuberitina sp.
Glomospiranella sp.
Inflatoendothyra "*inflata*" (Lipina)
Kamaena sp.
Latiendothyra sp.
Latiendothyra of the group *L. latispiralis* (Lipina *in* Grozdilova and Lebedeva)
Latiendothyra of the group *L. parakosvensis* (Lipina)
Palaeoberesella sp.
Parathurammina sp.
Parathurammina of the group *P. cushmani* Suleimanov
Parathurammina of the group *P. dagmarae* Suleimanov
Parathurammina of the group *P. paracushmani* Reitlinger
Parathurammina of the group *P. spinosa* (Williamson)
Parathurammina of the group *P. suleimanovi* Lipina
Proninella sp.
Pseudoammodiscus sp.
Radiosphaerina sp.
Septabrunsiina sp.
Septaglomospiranella sp.
Septaglomospiranella dainae Lipina
Septatournayella sp.
Septatournayella pseudocamerata Lipina *in* Lebedeva
Spinoendothyra sp.
Spinoendothyra bellicosta (Malakhova)
Spinoendothyra corona (Malakhova)
Spinoendothyra spinosa (Chernysheva)
Spinotournayella tumula (Zeller)
Tournayella sp.
Tuberendothyra sp.
Vicinesphaera sp.

Zone 10
Brunsia sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
"*Cornuspira*" sp.
Dainella sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis of the group *E. spiroides* (Zeller)
Eoforschia sp.
cf. *Eoparastaffella* sp.
"*Globoendothyra*"(?) *trachida* (Zeller)
Inflatoendothyra "*inflata*" (Lipina)
Latiendothyra sp.
Priscella of the group *P. prisca* (Rauzer-Chernoussova and Reitlinger)
Septatournayella kennedyi Skipp, Holcomb and Gutschick
relict *Spinoendothyra* sp.
Tetrataxis sp.

Zone 11
Brunsia sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
"*Cornuspira*" sp.
Dainella sp.
Earlandia sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia minima (Birina)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Endothyra sp.
Eoendothyranopsis of the group *E. spiroides* (Zeller)
Eoendothyranopsis spiroides (Zeller)
Eoforschia sp.
primitive *Eoparastaffella* sp.
Eostaffella sp.
Girvanella sp.
Globoendothyra sp.
Globoendothyra of the group *G. baileyi* (Hall)
Globoendothyra baileyi bridgensis Skipp (scarce)
Latiendothyra sp.
Parathurammina of the group *P. cushmani* Suleimanov
cf. *Planoendothyra* sp.
Priscella of the group *P. prisca* (Rauzer-Chernoussova and Reitlinger)
Pseudoammodiscus sp.
Septabrunsiina sp.
Septabrunsiina kennedyi Skipp, Holcomb and Gutschick
Septatournayella sp.
"*Septatournayella*"(?) *henbesti* Skipp, Holcomb and Gutschick
relict *Spinoendothyra* sp.
Stacheia and *Stacheoides* sp.
cf. *Uvatournayella* (?) sp.
cf. *Uviella* ? sp.

Zone 12
Brunsia sp.
Calcisphaera sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)

"*Cornuspira*" sp.
Earlandia sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Endothyra sp.
primitive cf. *Endothyranopsis* (in upper part of zone only)
Eoendothyranopsis of the group *E. spiroides* (Zeller)
Eoendothyranopsis aff. *E. thompsoni* (Anisgard and Campau)
Eoendothyranopsis hinduensis (Skipp *in* McKee and Gutschick)
Eoendothyranopsis spiroides (Zeller)
Eoforschia sp.
Eoforschia of the group *E. moelleri* (Malakhova *in* Dain) (=*E. nonconstricta* [McKay and Green])
Eostaffella sp.
Girvanella sp.
Globoendothyra of the group *G. baileyi* (Hall)
Globoendothyra baileyi bridgensis Skipp (abundant)
Globoendothyra paula (Vissarionova) (scarce)
Irregularina sp.
Koninckopora sp.
Latiendothyra sp.
Palaeotextularia sp.
Parathurammina sp.
Priscella of the group *P. prisca* (Rauzer-Chernoussova and Reitlinger)
Pseudoendothyra sp.
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella sp.
"*Septatournayella*" (?) *henbesti* Skipp, Holcomb and Gutschick
Skippella redwallensis (Skipp *in* McKee and Gutschick)
Stacheia and *Stacheoides* sp.
cf. *Tournayella* sp.

Zone 13

Archaediscus of the group *A. krestovnikovi* Rauzer-Chernoussova
Calcisphaera sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
"*Cornuspira*" sp.
Diplosphaerina sp.
Earlandia sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Endothyra sp.
Endothyra of the group *E. bowmani* Phillips *in* Brown emend. Brady
Endothyranopsis sp.
Endothyranopsis compressa (Rauzer-Chernoussova and Reitlinger)
Eoendothyranopsis sp.
Eoendothyranopsis of the group *E. ermakiensis* (Grozdilova *in* Lebedeva)
Eoendothyranopsis of the group *E. pressa* and *E. rara* (Grozdilova *in* Lebedeva)
Eoendothyranopsis scitula (Toomey)
Eoendothyranopsis thompsoni (Anisgard and Campau)
Eoforschia sp.
Eotuberitina sp.
Girvanella sp.
Globoendothyra of the group *G. tomiliensis* (Grozdilova)
Globoendothyra paula (Vissarionova)
cf. *Irregularina-Paracaligelloides*? sp.
cf. *Lugtonia*? sp.
"*Palaeotextularia*" of the group "*P.*" *longiseptata* Lipina
Parathurammina of the group *P. cushmani* Suleimanov
Parathurammina of the group *P. suleimanovi* Lipina
Pseudoammodiscus sp.
Pseudoendothyra sp.
Radiosphaerina sp.
Skippella redwallensis (Skipp *in* McKee and Gutschick)
Stacheia and *Stacheoides* sp.
Vicinesphaera sp.

Zone 14

Archaediscus sp.
Archaediscus of the group *A. krestovnikovi* Rauzer-Chernoussova
Archaediscus krestovnikovi Rauzer-Chernoussova
Banffella banffensis (McKay and Green)
Brunsia lenensis Bogush and Yuferev
Calcisphaera sp.
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
"*Cornuspira*" sp.
Earlandia sp.
Earlandia clavatula (Howchin)
Earlandia elegans (Rauzer-Chernoussova)
Earlandia vulgaris (Rauzer-Chernoussova and Reitlinger)
Earlandinella sp.
Endothyra sp.
Endothyra of the group *E. bowmani* Phillips *in* Brown emend. Brady
Endothyranella recta (Brady)
Endothyranopsis sp.
Endothyranopsis compressa (Rauzer-Chernoussova and Reitlinger)
Eoendothyranopsis sp.
Eoendothyranopsis of the group *E. ermakiensis* (Grozdilova *in* Lebedeva)
Eoendothyranopsis of the group *E. pressa* and *E. rara* (Grozdilova *in* Lebedeva)
Eoendothyranopsis macra (Zeller)
Eoendothyranopsis scitula (Toomey)
Eoforschia sp.
Eoforschia of the group *E. moelleri* (Malakhova *in* Dain)
Girvanella sp.
Globoendothyra sp.
Globoendothyra cf. *G.* of the group *G. globulus* (d'Eichwald)
Globoendothyra of the group *G. tomiliensis* (Grozdilova)
Globoendothyra paula (Vissarionova)
Irregularina sp.

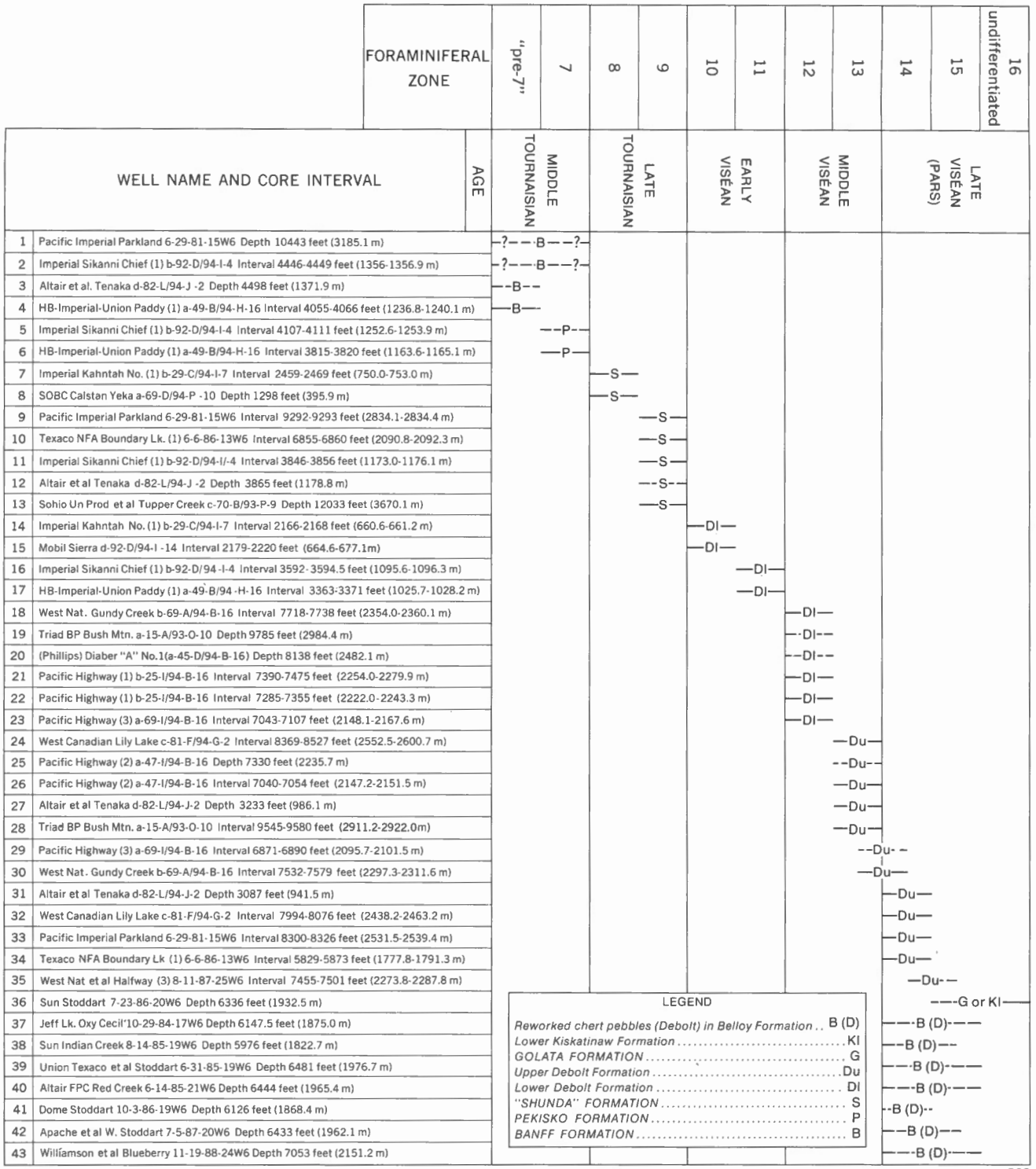

Figure 6. Distribution of foraminiferal zones in subsurface formations.

Koninckopora sp.
"*Palaeotextularia*" of the group "*P.*" *consobrina* Lipina
Parathurammina sp.
Priscella of the group *P. prisca* (Rauzer-Chernoussova and Reitlinger)
Propermodiscus sp.
Pseudoammodiscus sp.
Septabrunsiina mackeei Skipp, Holcomb and Gutschick
Skippella redwallensis (Skipp *in* McKee and Gutschick)
Stacheia and *Stacheoides* sp.
Tetrataxis sp.
cf. *Tournayella*? sp.
Vicinesphaera sp.

Zone 15
Archaediscus of the group *A. chernoussovensis* Mamet
Archaediscus cf. *A. enormis* Schlykova
Archaediscus of the group *A. krestovnikovi* Rauzer-Chernoussova
Archaediscus of the group *A. moelleri* Rauzer-Chernoussova
Archaediscus of the group *A. pauxillus* Schlykova
Calcisphaera laevis Williamson
Calcisphaera pachysphaerica (Pronina)
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Endothyranopsis crassa (Brady)
Eoendothyranopsis robusta (McKay and Green)
Eoforschia sp.
Globoendothyra sp.
Parathurammina sp.
Septabrunsiina mackeei Skipp, Holcomb and Gutschick
Tetrataxis sp.

Zone 16 (undifferentiated)
Archaediscus of the group *A. krestovnikovi* Rauzer-Chernoussova
Endothyra of the group *E. bowmani* Phillips *in* Brown emend. Brady
Globoendothyra sp.
Neoarchaediscus sp.
"*Palaeotextularia*" of the group "*P.*" *longiseptata* Lipina

Zone "pre-7"—The scarcity of foraminifers in the lower part of the Lower Carboniferous in British Columbia allows recognition of only some of the characteristic elements of Zone 7. In particular, *Palaeospiroplectammina chernyshinensis* and *Rectoseptaglomospiranella* sp. are not present. This anomaly probably is related to widespread unfavourable environmental conditions, and Zone "pre-7" is probably equivalent in age to the lower part of Zone 7 as originally described in Europe (Mamet and Skipp, 1970).

Zone 7 is characterized by numerous Tournayellidae and Endothyridae, among which *Chernyshinella, Palaeospiroplectammina* and *Rectoseptaglomospiranella* are the most conspicuous.

Zone 8, as in the preceding Zone 7, is rich in Tournayellidae and Endothyridae. *Tuberendothyra* among the endothyroids and *Septaglomospiranella dainae* among the tournayellids are characteristically abundant at this level.

Zone 9 represents the acme for *Spinoendothyra* and associated spinose tournayellids (*Carbonella*). The Tetrataxidae appear at this level.

Zone 10 contains the passage from Tournaisian to Viséan fauna. Many Tournaisian endothyroids and tournayellids are still conspicuous, but are associated with Viséan forms such as *Globoendothyra* and *Dainella. Inflatoendothyra* is present.

Zone 11 is characterized by the elimination of many relict Tournaisian elements and the concomitant strong development of *Eoendothyranopsis, Stacheia* and *Stacheoides.*

Zone 12 contains the first *Koninckopora* and *Palaeotextularia* sp. The flourishing Lower Viséan *Eoendothyranopsis spiroides* group does not extend above this zone.

Zone 13 is marked by a strong influx of *Eoendothyranopsis scitula, E.* of the group *E. pressa* and *E. rara*, and *Endothyranopsis*, replacing the *Eoendothyranopsis spiroides* group. The Archaediscidae, although in the underlying zone, become a conspicuous element of the microfacies for the first time.

Zone 14 is recognized by the presence of numerous *Eoendothyranopsis macra* and *Banffella banffensis*. These Endothyranopsidae are characteristic of shallow-water marine carbonate; as a result of variation in salinity they can be replaced by a homogeneous assemblage of minute *Brunsia*, known as the '*Brunsia* facies'.

Zone 15 is the acme level for *Endothyranopsis-Eoendothyranopsis* and *Eoforschia*. Gigantic Archaediscidae also appear at this level.

Zone 16 is marked by the elimination of *Eoendothyranopsis* and *Eoforschia* and the appearance of *Neoarchaediscus* sp.

Major elements of the macrofauna

The sequence of macrofossils in the study-area (Fig. 7) is similar to that presented by Macqueen and Bamber (1967, 1968, *see* also Petryk *et al.*, 1970, p. 99) for the Banff Formation and Rundle Group of the Rocky Mountains and Foothills in southwestern Alberta. In northeastern British Columbia, however, the sequence is incomplete because of discontinuity in the subsurface cores available for sampling and an almost complete lack of macrofauna in the lower Banff Formation, the Besa River Formation and the lower Prophet Formation (Appendix, locs. 39–41).

Tournaisian faunas are poorly represented. The oldest fauna, which occurs rarely in both surface (Besa River Fm., loc. 41) and subsurface (upper Banff Fm., loc. 32), has several brachiopods in common with the Middle Tournaisian "*Platyrachella*" *rutherfordi* fauna of Nelson (1961). Several wells (Figs. 2, 3) contain microfossils of foraminiferal zone "pre-7" at this level. Almost no Upper Tournaisian macrofossils have been found in the area, other than a small fauna including *Lophophyllum*? *proteus* (Sutherland), *Homalophyllites* sp., *Vesiculophyllum* sp., *Prospira*? *minnewankensis* (Shimer) and *Spirifer* cf. *S. rowleyi* Weller from the Pekisko, "Shunda" and lower Flett formations. An unstudied brachiopod fauna is also found at this level in the Flett Formation.

Lower and Middle Viséan corals are abundant above this sparsely fossiliferous interval in both surface (Member B of the Prophet Fm., middle Flett Fm.) and subsurface (lower member, Debolt Fm.). They include such forms as *Lithostrotion* (*Siphonodendron*) *oculinum* Sando, *L.* (*S.*) *sinuosum* (Kelly) and species of the genera *Zaphriphyllum, Canadiphyllum*

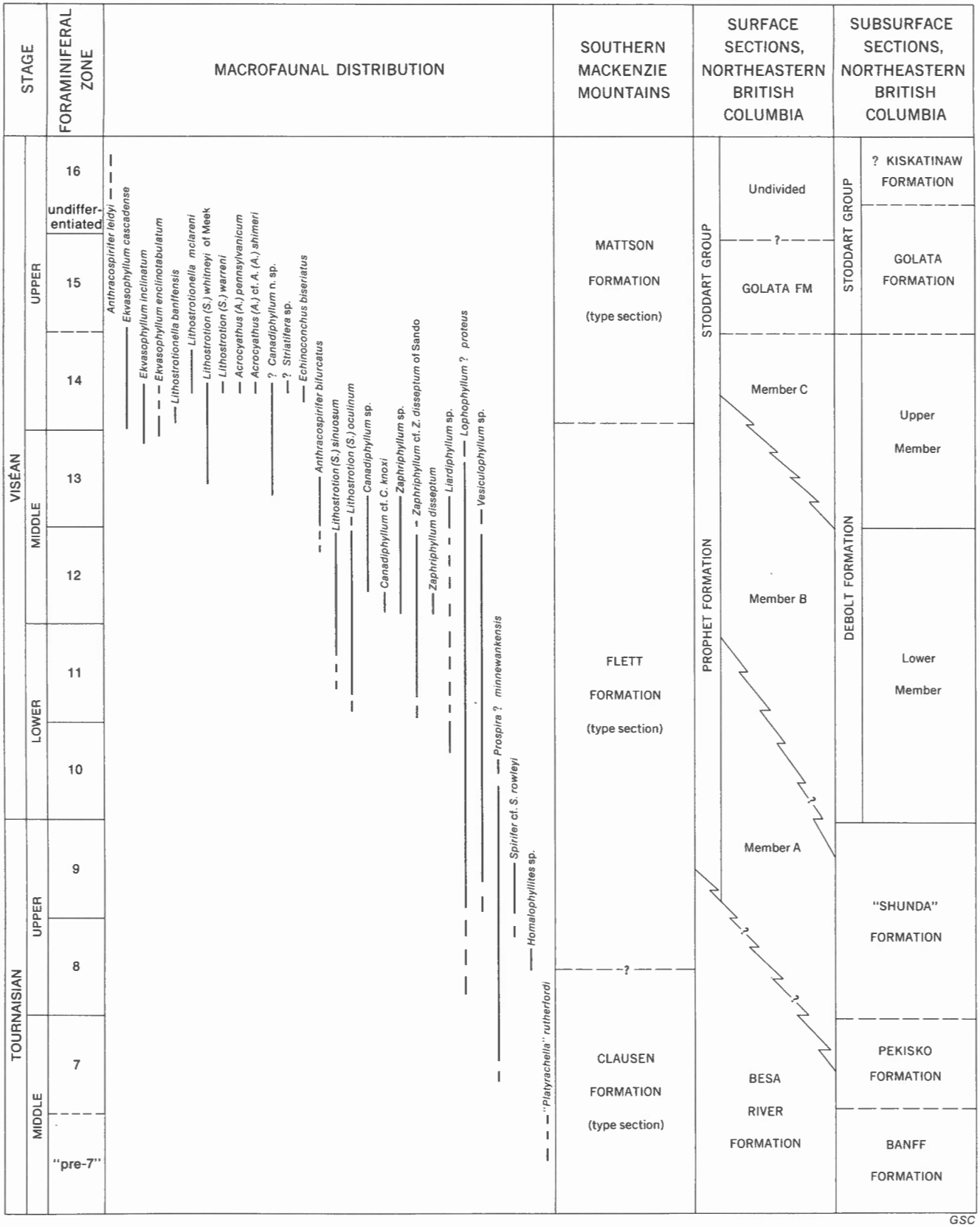

Figure 7. Stratigraphic range of foraminiferal zones and macrofauna in northeastern British Columbia and southwestern District of Mackenzie.

and *Liardiphyllum*. These corals are associated with microfossils of foraminiferal zones 10 to 12 (Fig. 7). They are succeeded in the upper member of the Debolt Formation, Member C of the Prophet Formation, and the upper Flett Formation by the most strongly developed coral fauna in the succession. This fauna, which is accompanied by rare brachiopods and lies within foraminiferal zones 13 and 14 (Late Middle Viséan to Early Late Viséan), represents Assemblage 2 and possibly the lower part of Assemblage 3 of Macqueen and Bamber (1968, p. 261–264). The most characteristic forms are *Lithostrotion* (*Siphonodendron*) *whitneyi* of Meek, *Lithostrotionella mclareni* (Sutherland), *Ekvasophyllum cascadense* (Warren), *E. inclinatum* Parks and *Echinoconchus biseriatus* (Hall). *Anthracospirifer bifurcatus* (Hall) and ?*Canadiphyllum* n. sp. (formerly referred to as "cf. *Timania* sp." by Macqueen and Bamber, 1968) occur below and with this fauna.

Macrofossils are rare higher in the section above the main carbonate units. The youngest Carboniferous macrofossils found by the authors are late Late Viséan brachiopods, including *Anthracospirifer leidyi* (Norwood and Pratten), *Composita* sp. and *Eumetria* sp., from subsurface at an undetermined level in the Stoddart Group above the Golata Formation (loc. 12).

Summarized biostratigraphy of type sections of Prophet and Flett formations

Figures 8 and 9 summarize the foraminiferal zonation, faunal distribution, age and lithology of the type sections of the Prophet and Flett formations. In both of these sections macrofossils and foraminifers increase markedly with decreasing age. Because of the scarcity of the older faunas, only the upper parts of the sections can be dated accurately. Very few algae are present; the Dasycladaceae (*Koninckopora*) are rare and the Cyanophyceae are absent. An obvious decrease in bathymetry is suggested by the gradual succession of the following populations from base to top: spiculites and radiolarians; pelmatozoans; pelmatozoans and bryozoans; pelmatozoans, bryozoans, brachiopods, corals and foraminifers (Mamet, 1972). The scarcity of green and blue algae, however, suggests that sedimentation took place under open-marine, low-energy conditions, in relatively deep water that was rather unfavourable for foraminifers. The families Endothyridae, Tournayellidae and Earlandiidae were able to adapt to rather deep water environments and therefore are fairly well represented. The families Tetrataxidae and Archaediscidae, however, are poorly represented and there are no Palaeotextulariidae.

Summarized biostratigraphy of formations in subsurface

Figure 6 shows the relationship between the foraminiferal zones outlined above and the subsurface stratigraphic units penetrated by some of the wells. The appendix gives more detailed information on microfaunal distribution. Subsurface occurrences of the macrofauna are listed in the appendix and tabulated on the cross-sections shown in Figures 2 and 3.

Comparison between faunal successions in northeastern British Columbia and other areas in western North America

Southwestern Alberta. The Lower Carboniferous macrofauna and microfauna of the study-area are similar, in both content and stratigraphic distribution, to those found in the Banff Formation and Rundle Group of southwestern Alberta (Figs. 4, 7; Macqueen and Bamber, 1967, 1968; Petryk *et al.*, 1970; Mamet 1968). In both regions the upper Banff Formation contains microfossils of foraminiferal zone "pre-7" and the lower part of Zone 7, associated with the "*Platyrachella*" *rutherfordi* fauna of Nelson (1961); the Pekisko Formation contains foraminiferal zone 7; and the Shunda contains Zones 8 and 9. Brachiopod and coral taxa found in the "Shunda" Formation of the study-area also occur within the larger and more diverse fauna from the Shunda Formation of southwestern Alberta. Faunas from the lower member of the Debolt Formation (Zones 10–12) correspond to those in the Turner Valley Formation and the lower three members of the Mount Head Formation to the south. In southwestern Alberta, however, two of the most distinctive coral species from this fauna—*Lithostrotion* (*Siphonodendron*) *oculinum* Sando and *Zaphriphyllum* cf. *Z. disseptum* Sutherland of Sando (1960)—appear to be restricted to the Early Viséan (Zones 10, 11), whereas in northeastern British Columbia these corals are found as high as Zone 12 and possibly extend into the basal part of Zone 13. The lower limit of their stratigraphic range in the north is unknown. Microfossils of foraminiferal Zones 13 and 14 and the associated abundant coral fauna that characterize the upper parts of the Debolt, Prophet and Flett formations in northeastern British Columbia (Fig. 7) are well represented in the upper Loomis, lower Marston, and lower Opal members of the Mount Head Formation in southwestern Alberta. This macrofauna has many species in common with Assemblage 2 and the lower part of Assemblage 3 of the southern area (Macqueen and Bamber, 1968). Elements of this fauna also occur in the lower part of the Golata Formation in the Nabesche River Section (Appendix, loc. 38). The lower part of the Golata Formation in its type section contains corals typical of the upper Mount Head Formation in association with microfossils of Zone 15 found in the Carnarvon Member and upper Opal Member of the Mount Head Formation. The younger faunas of the Stoddart Group have brachiopods and microfossils (Zone 16) in common with the Etherington Formation of southwestern Alberta (Mamet, 1968).

Western United States. Further comparisons can be made with the Lower Carboniferous sequence of the western United States (Utah, Montana, Idaho and Wyoming; Sando *et al.*, 1969). The Tournaisian macrofaunal successions of the two regions are difficult to compare because the northern fauna is poorly developed. The Middle Tournaisian "*Platyrachella*" *rutherfordi* fauna, as such, has not been reported from the western United States, but this fauna contains brachiopods that occur in macrofaunal zones B and C_1 of Sando *et al.* (*ibid.*) and both the northern and southern faunas correspond in stratigraphic position to foraminiferal zones "pre-7" and 7. In addition, the "*P.*" *rutherfordi* fauna, in southwestern Alberta, is associated with *Lithostrotionella microstylum* (White), which is common in Zone C_1. Upper Tournaisian rocks within foraminiferal zones 8 and 9 have yielded few macrofossils from the study-area. Those present include relatively long ranging forms, such as *Spirifer* cf. *S. rowleyi* Weller, *Prospira*? *minnewankensis* (Shimer) (="*Spirifer*" aff. "*S.*" *centronatus* of Sando *et al.*, 1969), *Vesiculophyllum* sp. and *Homalophyllites* sp., which occur in Zone C_2 of Sando *et al.* (*ibid.*) but are not restricted to it.

In the western United States, the distinctive coral *Lithostrotion* (*Siphonodendron*) *oculinum* Sando (Zone D of Sando *et al.*, *ibid.*) is known only from the Lower Viséan (foraminiferal zones 10 and 11), whereas it ranges through Zone 12 in northeastern British Columbia. However, Zone 12 is almost totally unknown because of a regional unconformity at this level in the southern area (Sando and Mamet, 1974), and the upper stratigraphic limit for *L.* (*S.*) *oculinum* may be greater than is shown by Sando *et al.* (1969). The next youngest, well-documented macrofaunal assemblage—the diverse coral fauna containing *Ekvasophyllum inclinatum* Parks and *Lithostrotion* (*S.*) *whitneyi* of Meek and corresponding to Assemblage 2 and the lower part of Assemblage 3 (Macqueen and Bamber, 1968) —represents Zone E of Sando *et al.* (*ibid.*) and straddles the boundary between Zones 13 and 14 as it does in the western United States. Scarcity of younger faunas in northeastern British Columbia precludes comparison with the southern succession above Zone E.

The close relationship between the surface and subsurface faunas within the study-area and between the faunal successions of the study-area, southwestern Alberta and the western United States suggests the following conclusions, which are similar to those drawn by Sando *et al.* (*ibid.*). For local correlation between subsurface and surface units in a single basin, for correlations between widely separated areas within the same basin and for correlations from basin to basin within the areas discussed above, there appears to be a generally consistent relationship between the vertical and lateral distribution of Lower Carboniferous macrofaunal and microfaunal assemblages. Although the abundance of the microfauna and macrofauna in these areas is affected by facies changes, both groups apparently have the same wide, approximately isochronous distribution across boundaries between laterally equivalent carbonate facies. In addition both groups evolved rapidly enough to provide numerous useful biostratigraphic markers. Because of their abundance and diversity, the foraminifers generally can be zoned more precisely to provide closer biostratigraphic control than is possible using macrofauna. On the other hand, brachiopods and corals are more resistant than are foraminifers to postdepositional destruction by diagenetic processes and, as Sando *et al.* (*ibid.*) showed, the macrofauna can be zoned more finely than the microfauna at some levels. Therefore age determinations and correlations will be most accurate if both microfaunal and macrofaunal distribution data are used for Lower Carboniferous biostratigraphic studies whenever possible.

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Appendix

Detailed biostratigraphy of subsurface and outcrop sections

1. SOHIO UN PROD ET AL TUPPER CREEK c-70-B/93-P-9

Microfacies at depth 12 033 ft (3670.1 m)

12 033 ft (3670.1 m) (GSC loc. C-2248)—43 ft (13.1 m) below top of "Shunda" Formation
Bioclastic wackestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Diplosphaerina sp.
Earlandia elegans
Endothyra sp.
Eotuberitina sp.
Latiendothyra ex gr. *L. latispiralis*
Latiendothyra ex gr. *L. parakosvensis*
Palaeoberesella aff. *P. lahuseni*
Palaeocancellus aff. *P. cancellatus*
Palaeocancellus robustus
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. paracushmani*
Parathurammina ex gr. *P. spinosa*
Parathurammina ex gr. *P. suleimanovi*
Radiosphaerina sp.
Septaglomospiranella sp.
Septatournayella sp.
Spinoendothyra sp.
Spinoendothyra bellicosta
Spinoendothyra corona
Spinoendothyra spinosa
Spinotournayella sp.
Tuberendothyra sp.
Vicinesphaera sp.

Age: Late Late Tournaisian (Zone 9)

2. IMPERIAL PACIFIC KILKERRAN 12-31-78-14W6

Microfacies between depths 10 892 and 10 901 ft (3322.1–3324.8 m)

10 892 ft (3322.1 m) (GSC loc. C-2245)—223 ft (68.0 m) below top of Banff Formation
Bioclastic wackestone
Foraminifera absent

Umbellina sp.

10 901 (3324.8 m) (GSC loc. C-2247)—232 ft (70.8 m) below top of Banff Formation
Slightly recrystallized bioclastic wackestone
Foraminifera very scarce

Earlandia minima

Age: probably Middle Tournaisian? (probably Zone "pre-7"?)

3. TRIAD BP BUSH MTN. a-15-A/93-O-10

Microfacies between depths 9545 and 9580 ft (2911.2–2921.9 m)

9545 ft (2911.2 m) (GSC loc. C-2794)—283 ft (86.3 m) below top of Debolt Formation
Recrystallized bioclastic wackestone, pellets abundant
Foraminifera fairly abundant

Brunsia sp.
Calcisphaera sp.
Earlandia ex gr. *E. elegans*
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa*
Eoendothyranopsis scitula
Globoendothyra ex gr. *G. tomiliensis*
Globoendothyra paula
Parathurammina sp.

9580 ft (2921.9 m) (GSC loc. C-2795)—318 ft (97 m) below top of Debolt Formation
Recrystallized bioclastic wackestone, pellets abundant
Foraminifera fairly abundant

Calcisphaera sp.
Earlandia sp.
Earlandia ex gr. *E. clavatula*
Earlandia ex gr. *E. vulgaris*
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa*
Globoendothyra sp.
Parathurammina sp.

Age: Late Middle Viséan (Zone 13)

Microfacies at depth 9785 ft (2984.4 m)

9785 ft (2984.4 m) (GSC loc. C-2796)—523 ft (159.5 m) below top of Debolt Formation
Lump-bearing bioclastic packstone
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Girvanella sp.
Koninckopora sp.
Stacheia and *Stacheoides* sp.

Age: Early Middle Viséan? (probably Zone 12)

4. PACIFIC IMPERIAL PARKLAND 6-29-81-15W6

Microfacies between depths 8300 and 8326 ft (2531.5–2539.4 m)

8300 ft (2531.5 m) (GSC loc. C-2150)—261 ft (79.6 m) below top of Debolt Formation
Bioclastic, intraclastic, oolitic packstone and grainstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica

Earlandia sp.
Globoendothyra ex gr. *G. tomiliensis*
Irregularina? sp.
Stacheia and *Stacheoides* sp.

8301 ft (2531.8 m) (GSC loc. C-2151)—262 ft (79.9 m) below top of Debolt Formation
Bioclastic oolitic packstone; recrystallized micrite matrix
Foraminifera scarce
Calcisphaera pachysphaerica
Earlandia sp.
Globoendothyra ex gr. *G. tomiliensis*

8305 ft (2533 m) (GSC loc. C-2152)—266 ft (81.1 m) below top of Debolt Formation
Bioclastic, oolitic wackestone grading to bioclastic oolitic grainstone
Foraminifera scarce
Calcisphaera pachysphaerica
Globoendothyra sp.
Stacheoides sp.

8306 ft (2533.3 m) (GSC loc. 43521)—267 ft (81.4 m) below top of Debolt Formation
Intraclastic, oolitic packstone and grainstone; slight silicification
Foraminifera scarce
Endothyra sp.
Eoendothyranopsis sp.

8310 ft (2534.6 m) (GSC loc. C-2153)—271 ft (82.7 m) below top of Debolt Formation
Dolomitized, recrystallized bryozoan wackestone
Foraminifera very scarce (ghosts)
Globoendothyra sp.

8314 ft (2535.8 m) (GSC loc. C-2154)—275 ft (83.9 m) below top of Debolt Formation
Bioclastic, oolitic packstone; pressure solution
Foraminifera scarce
Calcisphaera laevis
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Globoendothyra ex gr. *G. tomiliensis*

8315 ft (2536.1 m) (GSC loc. C-2155)—276 ft (84.2 m) below top of Debolt Formation
Bioclastic oolitic packstone and grainstone; pressure solution
Foraminifera present
Archaediscus sp.
Brunsia sp.
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoforschia sp.
Eoforschia ex gr. *E. moelleri*
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Stacheia and *Stacheoides* sp.

8316 ft (2536.4 m) (GSC loc. 43519)—277 ft (84.5 m) below top of Debolt Formation
Bioclastic intraclastic packstone and grainstone; pressure solution
Foraminifera present
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoforschia sp.
"*Palaeotextularia*" ex gr. "*P.*" *consobrina*
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.

8319 ft (2537.3 m) (GSC loc. C-2156)—280 ft (85.4 m) below top of Debolt Formation
Intraclastic oolitic packstone and grainstone; pressure solution
Foraminifera present
Archaediscus sp.
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia sp.
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Eoforschia "*nonconstricta*"
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.

8324 ft (2538.8 m) (GSC loc. C-2157)—285 ft (86.9 m) below top of Debolt Formation
Bioclastic, oolitic packstone and grainstone
Foraminifera present to abundant
Archaediscus sp.
Banffella banffensis
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Eoforschia sp.
Globoendothyra sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.

8326 ft (2539.4 m) (GSC loc. C-2158)—287 ft (87.5 m) below top of Debolt Formation
Intraclastic bioclastic wackestone
Foraminifera present to abundant
Archaediscus sp.
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.
Vicinesphaera sp.
Age: Early Late Viséan (Zone 14)

Macrofauna at depth 8756 ft (2670.6 m)

8756 ft (2670.6 m) (GSC loc. 43525)—717 ft (218.7 m) below top of Debolt Formation
?orthotetinid brachiopod
?*Paraconularia* sp.

Microfacies between depths 9292 and 9293 ft (2834.1–2834.4 m)

9292 ft (2834.1 m) (GSC loc. C-2159)—112 ft (34.2 m) below top of "Shunda" Formation
Recrystallized, dolomitized bioclastic wackestone grading to intraclast-bearing, recrystallized bioclastic wackestone; pellets abundant
Foraminifera present to abundant
Calcisphaera laevis
Calcisphaera pachysphaerica
Diplosphaerina sp.
Earlandia clavatula
Earlandia elegans
Eotuberitina sp.
Glomospiranella sp.
Latiendothyra sp.
Parathurammina sp.
"*Radiosphaerina*" sp.
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella sp.
Spinoendothyra sp.
Spinoendothyra bellicosta
Spinoendothyra corona
Spinoendothyra spinosa
Vicinesphaera sp.

9293 ft (2834.4 m) (GSC loc. 44037)—113 ft (34.5 m) below top of "Shunda" Formation
Slightly silicified bioclastic wackestone; pressure solution
Foraminifera scarce
Calcisphaera sp.
Endothyra sp.
Parathurammina sp.
Age: Late Late Tournaisian (Zone 9)

Macrofauna at depth 9293 ft (2834.4 m)

9293 ft (2834.4 m) (GSC loc. 44037)—113 ft (34.5 m) below top of "Shunda" Formation
Camarotoechia sp.
Prospira? *minnewankensis* (poorly preserved)

Macrofauna at depth 9722 ft (2965.2 m)

9722 ft (2965.2 m) (GSC loc. 43518)—150 ft (45.8 m) below top of Pekisko Formation
?*Brachythyris* sp.
?*Cleiothyridina* sp.
Prospira? *minnewankensis*
Age: Middle to Late Tournaisian

Microfacies at depth 10 443 ft (3185.1 m)

10 443 ft (3185.1 m) (GSC loc. C-2160)—438 ft (133.6 m) below top of Banff Formation
Recrystallized bioclastic wackestone bearing spicules and ostracodes
Foraminifera very scarce
Septaglomospiranella sp.
Age: assemblage not diagnostic (probably Zone 7 or "pre-7", Middle Tournaisian)

5. TEXACO NFA BOUNDARY LK. (1) 6-6-86-13W6

Microfacies between depths 5829 and 5873 ft (1777.8–1791.3 m)

5829 ft (1777.8 m) (GSC loc. 70427)—top of Debolt Formation
Silicified bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Earlandinella sp.
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoforschia ex gr. *E. moelleri*
Girvanella sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. tomiliensis*

5838 ft (1780.6 m) (GSC loc. C-2163)—9 ft (2.7 m) below top of Debolt Formation
Bioclastic lump-bearing wackestone
Foraminifera present
Banffella banffensis
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Globoendothyra sp.
Koninckopora sp.

5855 ft (1785.8 m) (GSC loc. C-2164)—26 ft (7.9 m) below top of Debolt Formation
Silicified bioclastic wackestone
Foraminifera abundant
Archaediscus sp.
Banffella banffensis
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis ex gr. *E. compressa*
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis ex gr. *E. scitula*
Eoforschia ex gr. *E. moelleri*
Globoendothyra ex gr. *G. tomiliensis*
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.
Vicinesphaera sp.

5873 ft (1791.3 m) (GSC loc. 70428)—44 ft (13.4 m) below top of Debolt Formation
Intrabiosparite; lump grainstone
Foraminifera abundant
Archaediscus sp.
Archaediscus krestovnikovi
Banffella banffensis
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia elegans
Earlandia clavatula
Earlandia vulgaris
Earlandinella sp.
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Eoendothyranopsis scitula
Eoforschia ex gr. *E. moelleri*

Eostaffella sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Globoendothyra paula
Irregularina(?) sp.
Parathurammina sp.
Priscella sp.
Propermodiscus sp.
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.
cf. *Tournayella* sp.
Vicinesphaera sp.

Age: Early Late Viséan (Zone 14)

Macrofauna between depths 5853 and 5887 ft (1785.2–1795.5 m)

5853 ft (1785.2 m) (GSC loc. 55780)—24 ft (7.3 m) below top of Debolt Formation

Cyathaxonia sp.
Lithostrotionella mclareni

5860 ft (1787.3 m) (GSC loc. 55778)—31 ft (9.5 m) below top of Debolt Formation

Syringopora sp.

5887 ft (1795.5 m) (GSC loc. 55777)—58 ft (17.7 m) below top of Debolt Formation

Syringopora sp.

Microfacies between depths 6855 and 6860 ft (2090.8–2092.3 m)

6855 ft (2090.8 m) (GSC loc. C-2167)—15 ft (4.6 m) below top of "Shunda" Formation
Slightly recrystallized bioclastic grainstone; pellets abundant
Foraminifera present

Calcisphaera laevis
cf. "*Cornuspira*" sp.
Earlandia elegans
cf. *Eotextularia*? sp.
Latiendothyra sp.
Parathurammina ex gr. *P. spinosa*
Parathurammina ex gr. *P. suleimanovi*
Pseudoammodiscus sp.
Septaglomospiranella sp.
Spinoendothyra sp.
Spinoendothyra spinosa
Tournayella sp.
Vicinesphaera sp.

6860 ft (2092.3 m) (GSC loc. C-2168)—20 ft (6.1 m) below top of "Shunda" Formation
Slightly recrystallized bioclastic grainstone; pellets abundant
Foraminifera present to abundant

Calcisphaera laevis
Earlandia elegans
Earlandia vulgaris
Earlandinella sp.
Latiendothyra sp.
Latiendothyra ex gr. *L. parakosvensis*
Latiendothyra latispiralis
Parathurammina sp.
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. suleimanovi*
Septabrunsiina krainica
Septaglomospiranella dainae
Septatournayella sp.
Spinoendothyra sp.
Spinoendothyra spinosa
Tuberendothyra sp.
Uslonia sp.
Vicinesphaera sp.

Age: Late Late Tournaisian (Zone 9)

6. JEFF LK. OXY CECIL 10-29-84-17W6

Microfacies at depth 6147.5 ft (1875 m)

6147.5 ft (1875 m) (GSC loc. C-2793)—base of Belloy Formation
Reworked chert pebbles in a dolomitic matrix
Foraminifera rare in the chert pebbles, absent from the matrix

Brunsia sp.
Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis sp.

Age: Late Viséan (Zone 14 or 15)—chert pebbles only

7. PACIFIC FT. ST. JOHN (4) 14-21-83-18W6

Microfacies at depth 6505 ft (1984 m)

6505 ft (1984 m) (GSC loc. 70439)—base of Belloy Formation
Dolomitic sandstone
Foraminifera very scarce

Nodosaria sp.

Age: Permian

Macrofauna at depth 6591 ft (2010.3 m)

6591 ft (2010.3 m) (GSC loc. 43539)—86 ft (26.2 m) below top of Taylor Flat Formation

Anthracospirifer sp. cf. *A. pellaensis*

Age: probably late Late Viséan (Chesteran)

8. SUN INDIAN CREEK 8-14-85-19W6

Microfacies at depth 5976 ft (1822.7 m)

5976 ft (1822.7 m) (GSC loc. C-2792)—3 ft (0.9 m) above base of Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in chert pebbles, absent from matrix

Archaediscus sp.
Banffella banffensis
Calcisphaera sp.
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis? sp.

Age: Early Late Viséan (Zone 14) or slightly younger—chert pebbles only

9. UNION TEXACO ET AL STODDART 6-31-85-19W6

Microfacies at depth 6481 ft (1976.7 m)

6481 ft (1976.7 m) (GSC loc. C-2779)—basal Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in pebbles, absent from matrix

Calcisphaera laevis
Earlandia ex gr. *E. vulgaris*
Eoendothyranopsis? sp.
Eoforschia? sp.
Eostaffella sp.
Globoendothyra sp.
Pseudoendothyra? sp.

Age: Late Viséan (Zone 14 or 15)—chert pebbles only

10. ALTAIR FPC RED CREEK 6-14-85-21W6

Microfacies at depth 6444 ft (1965.4 m)

6444 ft (1965.4 m) (GSC loc. C-2791)—34 ft (10.4 m) below top of Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in chert pebbles, absent from matrix

Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa*
Eostaffella sp.
Globoendothyra sp.

Age: Late Viséan (Zone 14 or 15)—chert pebbles only

11. SUN STODDART 7-23-86-20W6

Microfacies between depths 6326 and 6336 ft (1929.4–1932.5 m)

6326 ft (1929.4 m) (GSC loc. C-2169)—15 ft (4.6 m) below top of Belloy Formation
Reworked chert pebbles in sandstone and recrystallized dolomitic, bioclastic wackestone
Foraminifera scarce in chert pebbles, absent from matrix

Archaediscus ex gr. *A. chernoussovensis*
Archaediscus cf. *A. enormis*
Archaediscus ex gr. *A. krestovnikovi*
Archaediscus ex gr. *A. pauxillus*
Endothyra sp.
Eoendothyranopsis sp.

Age: Middle Late Viséan (Zone 15)—chert pebbles only

6336 ft (1932.5 m) (GSC loc. 70432)—6 ft (1.8 m) below top of ?Kiskatinaw or ?Golata Formation
Silicified sandstone and recrystallized bioclastic wackestone with reworked chert pebbles
Foraminifera scarce in chert pebbles, very scarce in matrix

Chert microfacies

Archaediscus ex gr. *A. krestovnikovi*
Archaediscus ex gr. *A. moelleri*
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyranopsis crassa
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra globulus
Tetrataxis sp.
Parathurammina sp.

Matrix microfacies

Archaediscus ex gr. *A. krestovnikovi*
Endothyra ex gr. *E. bowmani*
Globoendothyra sp.
Neoarchaediscus sp.
"*Palaeotextularia*" ex gr. "*P.*" *longiseptata*

Age: Late Late Viséan matrix with reworked Middle Late Viséan chert pebbles (Zone 15 reworked into 16)

12. SOUTHERN PRODUCTION CANADIAN ATLANTIC B-14-I (1-12-84-23W6)

Macrofauna at depth 6842 ft (2086.8 m)

6842 ft (2086.8 m) (GSC loc. 70467)—297 ft (90.6 m) below top of Stoddart Group

Anthracospirifer leidyi
Composita sp.
Eumetria sp.

Age: Late Late Viséan (Chesteran)

13. PACIFIC STODDART 11-2-86-19W6

Microfacies at depth 6180 ft (1884.9 m)

6180 ft (1884.9 m) (GSC loc. C-2783)—24 ft (7.3 m) below top of Belloy Formation
Reworked chert pebbles in dolomitic matrix

Calcisphaera pachysphaerica
Earlandia sp.
Endothyra ex gr. *E. bowmani*
Globoendothyra sp.

Age: Viséan (zone not determined)—chert pebbles only

14. DOME STODDART 10-3-86-19W6

Microfacies at depth 6126 ft (1868.4 m)

6126 ft (1868.4 m) (GSC loc. C-2789)—2 ft (0.6 m) above base of Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in chert pebbles, absent from matrix

Banffella banffensis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.

Age: Early Late Viséan (Zone 14)—chert pebbles only

15. APACHE ET AL W. STODDART 7-5-87-20W6

Microfacies at depth 6433 ft (1962.1 m)

6433 ft (1962.1 m) (GSC loc. C-2786)—16 ft (4.9 m) above base of Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in chert pebbles, absent from matrix

Banffella banffensis
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia vulgaris
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyra ex gr. *E. similis*
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*

Age: Early Late Viséan (Zone 14) or slightly younger—chert pebbles only

16. IMPERIAL PACIFIC CAMERON R. 3-17-87-23W6

Microfacies at depth 7723 ft (2355.5 m)

7723 ft (2355.5 m) (GSC loc. C-2249)—350 ft (106.8 m) below top of Debolt Formation
Bioclastic, intraclastic, oolitic packstone
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Globoendothyra ex gr. *G. tomiliensis*
Koninckopora sp.
Parathurammina sp.
Stacheia and *Stacheoides* sp.

Age: Late Middle Viséan to Early Late Viséan (Zone 13 or 14)

17. WEST. NAT. ET AL HALFWAY (3) 8-11-87-25W6

Microfacies between depths 7455 and 7501 ft (2273.8–2287.8 m)

7455 ft (2273.8 m) (GSC loc. C-2797)—5 ft (1.5 m) below top of Debolt Formation
Lump-bearing bioclastic packstone

Eoendothyranopsis sp.
Eoforschia sp.
Stacheoides sp.

7461 ft (2275.6 m) (GSC loc. C-2798)—11 ft (3.4 m) below top of Debolt Formation
Lump-bearing bioclastic wackestone

Brunsia sp.
Calcisphaera sp.
Earlandia ex gr. *E. clavatula*
Earlandia ex gr. *E. elegans*
Earlandia ex gr. *E. vulgaris*
Endothyra sp.
Endothyranopsis cf. *E. crassa*
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis robusta
Eoendothyranopsis scitula
Globoendothyra sp.
Paracalligelloides sp.

7467 ft (2277.4 m) (GSC loc. C-2799)—17 ft (5.2 m) below top of Debolt Formation
Recrystallized wackestone
Banffella banffensis
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoforschia sp.
Girvanella sp.

7475 ft (2279.9 m) (GSC loc. C-2800)—25 ft (7.6 m) below top of Debolt Formation
Lump-bearing bioclastic packstone
Banffella banffensis
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. tomiliensis*
Stacheoides sp.

Age: Early Late Viséan (Zone 14/15 boundary)

Macrofauna between depths 7460 and 7572 ft (2275.3–2309.5 m)

7460 ft (2275.3 m) (GSC loc. 55791)—10 ft (3.1 m) below top of Debolt Formation
?*Buxtonia* sp.
Echinoconchus cf. *E. genevievensis*
Girtyella sp. cf. *G. turgida*
fenestrate bryozoans
proetid trilobite pygidium

7572 ft (2309.5 m) (GSC loc. 55787)—122 ft (37.2 m) below top of Debolt Formation
Lophophyllum? *proteus*

Microfacies between depths 7619 and 7688 ft (2323.8–2344.8 m)

7619 ft (2323.8 m) (GSC loc. C-2802)—169 ft (51.5 m) below top of Debolt Formation
Lump-bearing bioclastic packstone
Calcisphaera sp.
Earlandia ex gr. *E. clavatula*
Earlandia ex gr. *E. vulgaris*
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa*
Eoendothyranopsis macra
Eoendothyranopsis scitula
Globoendothyra sp.
Irregularina? sp.
Parathurammina sp.
Skippella redwallensis
Stacheoides sp.

7626 ft (2325.9 m) (GSC loc. C-2803)—176 ft (53.7 m) below top of Debolt Formation
Lump-bearing, oolitic, bioclastic packstone
Calcisphaera sp.
Earlandia sp.
Endothyra ex gr. *E. bowmani*
Endothyra ex gr. *E. similis*
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Globoendothyra sp.
Parathurammina sp.
Skippella redwallensis

7667 ft (2338.4 m) (GSC loc. C-2804)—217 ft (66.2 m) below top of Debolt Formation
Lump-bearing, oolitic, bioclastic packstone
Brunsia sp.
Calcisphaera sp.
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoforschia sp.

7688 ft (2344.8 m) (GSC loc. C-2805)—238 ft (72.6 m) below top of Debolt Formation
Lump-bearing bioclastic packstone
Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis sp.

Age: Late Middle Viséan (Zone 13)

18. WEST NAT. ET AL BERNADET 8-1-88-25W6

Macrofauna between depths 7292 and 7314 ft (2224.1–2230.8 m)

7292 ft (2224.1 m) (GSC loc. 70446)—266 ft (81.1 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) *whitneyi*? of Meek

7293 ft (2224.4 m) (GSC loc. 70447)—267 ft (81.4 m) below top of Debolt Formation
Syringopora sp.
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *whitneyi* of Meek
Lophophyllum? cf. *L.*? *proetus*

7304 ft (2227.7 m) (GSC loc. 70448)—278 ft (84.8 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

7314 ft (2230.8 m) (GSC loc. 70449)—288 ft (87.8 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *oculinum*

Age: late Middle to early Late Viséan.

19. WILLIAMSON ET AL BLUEBERRY 11-19-88-24W6

Microfacies at depth 7053 ft (2151.2 m)

7053 ft (2151.2 m) (GSC loc. C-2784)—?basal Belloy Formation
Reworked chert pebbles in dolomitic matrix
Foraminifera rare in chert pebbles, absent from matrix
cf. *Banffella*? sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Eoendothyranopsis? sp.

Age: undetermined Viséan zone (probably Zone 14 or 15)—chert pebbles only

20. WEST NAT. ET AL BLUEBERRY (13) d-50-K/94-A-12

Macrofauna between depths 6845 and 6868 ft (2087.7–2094.7 m)

6845 ft (2087.7 m) (GSC loc. 43470)—145 ft (44.2 m) below top of Debolt Formation
Syringopora sp.

6846 ft (2088 m) (GSC loc. 43471)—146 ft (44.5 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

6861 ft (2092.6 m) (GSC loc. 43474)—161 ft (49.1 m) below top of Debolt Formation
Syringopora sp.

6868 ft (2094.7 m) (GSC loc. 43472)—168 ft (51.2 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

Age: late Middle to early Late Viséan

21. DECALTA BLUEBERRY d-57-D/94-A-13

Macrofauna between depths 7285 and 7383 ft (2221.9–2251.8 m)

7285 ft (2221.9 m) (GSC loc. 70454)—19 ft (5.8 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

7328 ft (2235 m) (GSC loc. 70453)—62 ft (18.9 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

7345 ft (2240.2 m) (GSC loc. 70452)—79 ft (24.1 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi*? of Meek

7383 ft (2251.8 m) (GSC loc. 70455)—117 ft (35.7 m) below top of Debolt Formation

Lophophyllum? *proteus*
Syringopora sp.

Age: late Middle to early Late Viséan

22. WEST NAT. ET AL BLUEBERRY c-65-D/94-A-13

Macrofauna between depths 6918 and 6971 ft (2110–2126.2 m)

6918 ft (2110 m) (GSC loc. 55771)—33 ft (10.1 m) below top of Debolt Formation

?*Lithostrotion* (*Siphonodendron*) *whitneyi* of Meek
Syringopora sp.

Age: probably late Middle to early Late Viséan

23. WEST NAT. ET AL BLUEBERRY d-46-D/94-A-13

Macrofauna between depths 7156 and 7161 ft (2182.6–2184.1 m)

7156–7161 ft (2182.6–2184.1 m) (GSC loc. 55793)—51–56 ft (15.6–17.1 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

Age: late Middle to early Late Viséan

24. WEST NAT. GUNDY CREEK b-69-A/94-B-16

Microfacies between depths 7532 and 7579 ft (2297.3–2311.6 m)

7532 ft (2297.3 m) (GSC loc. C-2170)—37 ft (11.3 m) below top of Debolt Formation

Slightly recrystallized bioclastic wackestone; rare nonskeletal debris
Foraminifera present to abundant

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia vulgaris
Earlandinita sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Irregularina sp.?
Stacheia and *Stacheoides* sp.

7540 ft (2299.7 m) (GSC loc. C-2171)—45 ft (13.7 m) below top of Debolt Formation

Slightly recrystallized bioclastic wackestone; oolites and lumps present
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Eoendothyranopsis sp.
Globoendothyra sp.
Stacheia and *Stacheoides* sp.

7559.5 ft (2305.6 m) (GSC loc. C-2172)—64.5 ft (19.7 m) below top of Debolt Formation

Intraclastic, oolitic packstone and grainstone
Foraminifera present to abundant

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Globoendothyra paula
Koninckopora sp.
Stacheia and *Stacheoides* sp.

7572 ft (2309.5 m) (GSC loc. C-2173)—77 ft (23.5 m) below top of Debolt Formation

Bioclastic, intraclastic packstone and grainstone
Foraminifera present to abundant

Calcisphaera laevis
Calcisphaera pachysphaerica
Diplosphaerina sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia ex gr. *E. moelleri*
Eotuberitina sp.
Globoendothyra ex gr. *G. tomiliensis*
Koninckopora sp.
Priscella ex gr. *P. prisca*
Propermodiscus sp.
Stacheia and *Stacheoides* sp.

7573 ft (2309.8 m) (GSC loc. C-2174)—78 ft (23.8 m) below top of Debolt Formation

Bioclastic wackestone grading to recrystallized wackestone
Foraminifera present to abundant

Archaediscus sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Globoendothyra ex gr. *G. tomiliensis*
Koninckopora sp.
Propermodiscus sp.
Stacheia and *Stacheoides* sp.

7579 ft (2311.6 m) (GSC loc. C-2175)—84 ft (25.6 m) below top of Debolt Formation

Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis cf. *E. macra*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra sp.
Stacheia and *Stacheoides* sp.

Age: Late Middle to Early Late Viséan (transition between Zones 13 and 14)

Macrofauna between depths 7545.5 and 7579 ft (2301.4–2311.6 m)

7545.5 ft. (2301.4 m) (GSC loc. 43502)—50.5 ft (15.4 m) below top of Debolt Formation
Syringopora sp.

7547 ft (2301.8 m) (GSC loc. 43497)—52 ft (15.9 m) below top of Debolt Formation
?*Ekvasophyllum enclinotabulatum*
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

7548 ft (2302.1 m) (GSC loc. 43496)—53 ft (16.2 m) below top of Debolt Formation
cf. *Dorlodotia* sp.
Syringopora sp.

7551 ft (2303.1 m) (GSC loc. 43490)—56 ft (17.1 m) below top of Debolt Formation
Cleiothyridina sp.
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

7575 ft (2310.4 m) (GSC loc. 43995)—80 ft (24.4 m) below top of Debolt Formation
immature horn coral, probably *Ekvasophyllum* sp.

7579 ft (2311.6 m) (GSC loc. 43501)—84 ft (25.6 m) below top of Debolt Formation
Ekvasophyllum enclinotabulatum

Microfacies between depths 7718 and 7738 ft (2354–2360.1 m)

7718 ft (2354 m) (GSC loc. C-2176)—223 ft (68 m) below top of Debolt Formation
Crinoidal packstone; minor nonskeletal elements; sparite in epitaxy on crinoids
Foraminifera present to abundant
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Globoendothyra sp.
Koninckopora sp.

7723 ft (2355.5 m) (GSC loc. C-2177)—228 ft (69.5 m) below top of Debolt Formation
Crinoidal packstone; minor nonskeletal elements; sparite in epitaxy on pelmatozoans
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Girvanella sp.
Globoendothyra sp.
Stacheia and *Stacheoides* sp.

7728 ft (2357 m) (GSC loc. C-2178)—233 ft (71.1 m) below top of Debolt Formation
Crinoidal packstone
Foraminifera scarce
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Endothyra sp.
Globoendothyra sp.
Pseudoammodiscus sp.

7731 ft (2358 m) (GSC loc. C-2179)—236 ft (72 m) below top of Debolt Formation
Crinoidal packstone; minor nonskeletal elements
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7733 ft (2358.6 m) (GSC loc. C-2180)—238 ft (72.6 m) below top of Debolt Formation
Recrystallized pelmatozoan packstone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Globoendothyra sp.
"*Globoendothyra*" *trachida*

7734 ft (2358.9 m) (GSC loc. C-2181)—239 ft (72.9 m) below top of Debolt Formation
Crinoidal packstone; minor nonskeletal elements
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis thompsoni
Eoforschia sp.
Globoendothyra sp.

7738 ft (2360.1 m) (GSC loc. C-2182)—243 ft (74.1 m) below top of Debolt Formation
Crinoidal packstone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis thompsoni
Eoforschia sp.
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Stacheia and *Stacheoides* sp.
Age: Early Middle Viséan (Zone 12)

25. (PHILLIPS) DIABER "A" NO. 1 (a-45-D/94-B-16)

Microfacies at depth 8138 ft (2482.1 m)

8138 ft (2482.1 m) (GSC loc. C-2189)—458 ft (139.7 m) below top of Debolt Formation
Pelmatozoan packstone; detrital quartz present; pressure solution
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Stacheia and *Stacheoides* sp.
Age: probably Early Middle Viséan (probably Zone 12)

26. PACIFIC HIGHWAY (2) a-47-I/94-B-16

Microfacies between depths 7040 and 7054 ft (2147.2–2151.5 m)

7040 ft (2147.2 m) (GSC loc. 43451)—47 ft (14.3 m) below top of Debolt Formation
Slightly recrystallized bioclastic wackestone
Foraminifera present
Calcisphaera laevis

Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*

7054 ft (2151.5 m) (GSC loc. 43445)—61 ft (18.6 m) below top of Debolt Formation
Recrystallized bioclastic grainstone and wackestone
Foraminifera abundant

Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Diplosphaerina sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra ex gr. *E. bowmani*
Endothyranopsis sp.
Eoendothyranopsis cf. *E.* ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis prodigiosa
Eoendothyranopsis scitula
Eoendothyranopsis thompsoni
Eoforschia moelleri
Eotuberitina sp.
Globoendothyra ex gr. *G. tomiliensis*
cf. *Irregularina*? sp.
cf. *Lugtonia*? sp.
"*Paleotextularia*" ex gr. "*P.*" *longiseptata*
Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. suleimanovi*
Pseudoammodiscus sp.
Pseudoendothyra sp.
Radiosphaerina sp.
Stacheia and *Stacheoides* sp.
Vicinesphaera sp.

Age: Late Middle Viséan (Zone 13)

Macrofauna at depth 7047 ft (2149.3 m)

7047 ft (2149.3 m) (GSC loc. 43446)—54 ft (16.5 m) below top of Debolt Formation

Lophophyllum? *proteus*

Microfacies at depth 7330 ft (2235.7 m)

7330 ft (2235.7 m) (GSC loc. 43452)—337 ft (102.8 m) below top of Debolt Formation
Wackestone, grading to slightly recrystallized bioclastic wackestone
Foraminifera present to abundant

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
cf. *Eoendothyranopsis* ex gr. *E. ermakiensis*
cf. *Eoendothyranopsis scitula*
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.

Age: Late Middle Viséan? (Zone 13?)—not enough material for precise age determination; possibly younger

Macrofauna between depths 7302 and 7330 ft (2227.1–2235.7 m)

7302 ft (2227.1 m) (GSC loc. 43454)—309 ft (94.2 m) below top of Debolt Formation

Syringopora sp.

7303 ft (2227.4 m) (GSC loc. 43447)—310 ft (94.6 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *oculinum*

7325 ft (2234.1 m) (GSC loc. 43453)—332 ft (101.3 m) below top of Debolt Formation

Lophophyllum? *proteus*

7330 ft (2235.7 m) (GSC loc. 43452)—337 ft (102.8 m) below top of Debolt Formation

Lophophyllum? *proteus*

27. PACIFIC HIGHWAY (3) a-69-I/94-B-16

Microfacies between depths 6871 and 6890 ft (2095.7–2101.5 m)

6871 ft (2095.7 m) (GSC loc. 43398)—79 ft (24.1 m) below top of Debolt Formation
Intraclast-bearing wackestone and bioclastic packstone and grainstone
Foraminifera very abundant

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoendothyranopsis thompsoni
Eoforschia ex gr. *E. moelleri* (*E. nonconstricta*)
Girvanella sp.
Globoendothyra ex gr. *G. tomiliensis*
Globoendothyra paula
Orthriosiphonoides sp.
Parathurammina sp.
Pseudoammodiscus sp.
Uviella sp.
Vicinesphaera sp.

6872 ft (2096 m) (GSC loc. 43973)—80 ft (24.4 m) below top of Debolt Formation
Silicified mudstone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.

6880 ft (2098.4 m) (GSC loc. 43975)—88 ft (26.8 m) below top of Debolt Formation
Bioclastic wackestone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra sp.
Parathurammina sp.

6884 ft (2099.6 m) (GSC loc. 43969)—92 ft (28.1 m) below top of Debolt Formation
Wackestone; rare intraclasts; pressure solution
Foraminifera scarce

Eoendothyranopsis sp.

6890 ft (2101.5 m) (GSC loc. 43968)—98 ft (29.9 m) below top of Debolt Formation
Bioclastic wackestone; pressure solution
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Globoendothyra sp.
Age: latest Middle Viséan: ranging possibly to earliest Late Viséan? (highest part of Zone 13; perhaps ranging into lower part of Zone 14)

Macrofauna between depths 6885 and 6887.5 ft (2100–2100.7 m)

6885 ft (2100 m) (GSC loc. 43399)—93 ft (28.4 m) below top of Debolt Formation
Lophophyllum? proteus

6887.5 ft (2100.7 m) (GSC loc. 43402)—95.5 ft (29.1 m) below top of Debolt Formation
Syringopora sp.

Microfacies between depths 7043 and 7107 ft (2148.1–2167.6 m)

7043 ft (2148.1 m) (GSC loc. 43404)—38 ft (11.6 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera scarce
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7045 ft (2148.7 m) (GSC loc. C-2183)—40 ft (12.2 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone; pressure solution
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia ex gr. *E. moelleri*
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Priscella ex gr. *P. prisca*
Septabrunsiina sp.
"*Septatournayella*"? *henbesti*

7047 ft (2149.3 m) (GSC loc. C-2184)—42 ft (12.8 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Endothyra sp.
Eoendothyranopsis sp.

7049 ft (2149.9 m) (GSC loc. C-2185)—44 ft (13.4 m) below top of lower Debolt Formation
Wackestone; pressure solution
Foraminifera scarce
Calcisphaera laevis
Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Globoendothyra sp.
Parathurammina sp.

7051 ft (2150.6 m) (GSC loc. C-2186)—46 ft (14 m) below top of lower Debolt Formation
Recrystallized wackestone; pressure solution
Foraminifera scarce
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides

7055 ft (2151.8 m) (GSC loc. C-2187)—50 ft (15.3 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Globoendothyra sp.
Skippella redwallensis

7057 ft (2152.4 m) (GSC loc. 43971)—52 ft (15.9 m) below top of lower Debolt Formation
Silicified, recrystallized and dolomitized bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra sp.

7064 ft (2154.5 m) (GSC loc. 43972)—59 ft (18 m) below top of lower Debolt Formation
Slightly recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
cf. earliest forms of *Eoendothyranopsis* ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eostaffella sp.
cf. *Irregularina-Paracaligelloides* sp.
Skippella redwallensis

7078 ft (2158.8 m) (GSC locs. 43977 and 43405)—73 ft (22.3 m) below top of lower Debolt Formation
Silicified mudstone
Foraminifera scarce
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra sp.

7081 ft (2159.7 m) (GSC loc. 43974)—76 ft (22.6 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone; pressure solution
Foraminifera scarce
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia sp.

7097 ft (2164.6 m) (GSC loc. C-2188)—92 ft (28.1 m) below top of lower Debolt Formation
Bioclastic packstone-grainstone
Foraminifera present to abundant
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoendothyranopsis thompsoni
Eoforschia sp.
Eoforschia ex gr. *E. moelleri*

Eostaffella? sp.
Globoendothyra ex gr. *G. tomiliensis*
cf. *Irregularina-Paracaligelloides* sp.
Parathurammina sp.
Pseudoendothyra sp.
Skippella redwallensis

7107 ft (2167.6 m) (GSC loc. 43976)—102 ft (31.1 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Eoendothyranopsis sp.
Globoendothyra sp.

Age: youngest part of the Early Middle Viséan, perhaps earliest Late Middle Viséan (high Zone 12, possibly base of 13?)

Macrofauna between depths 7045 and 7115 ft (2148.7–2170.1 m)

7045 ft (2148.7 m) (GSC loc. 43401)—40 ft (12.2 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7051 ft (2150.6 m) (GSC loc. 43395)—46 ft (14 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7070.5 ft (2156.5 m) (GSC loc. 43393)—65.5 ft (20 m) below top of lower Debolt Formation
Ekvasophyllum sp.

7075 ft (2157.9 m) (GSC locs. 43417 and 43414)—70 ft (21.4 m) below top of lower Debolt Formation
Zaphriphyllum cf. *Z. disseptum*

7076 ft (2158.2 m) (GSC loc. 43397)—71 ft (21.7 m) below top of lower Debolt Formation
Zaphriphyllum cf. *Z. disseptum*

7078 ft (2158.8 m) (GSC loc. 43405)—73 ft (22.3 m) below top of lower Debolt Formation
horn coral indet.
Syringopora sp.

7080 ft (2159.4 m) (GSC loc. 43409)—75 ft (22.9 m) below top of lower Debolt Formation
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *oculinum*

7088 ft (2161.8 m) (GSC loc. 43400)—83 ft (25.3 m) below top of lower Debolt Formation
?*Ekvasophyllum inclinatum*

7092 ft (2163.1 m) (GSC loc. 43406)—87 ft (26.5 m) below top of lower Debolt Formation
Syringopora sp.

7093 ft (2163.4 m) (GSC loc. 43407)—88 ft (26.8 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7098 ft (2164.9 m) (GSC loc. 44038)—93 ft (28.4 m) below top of lower Debolt Formation
Zaphriphyllum cf. *Z. disseptum*

7113 ft (2169.5 m) (GSC locs. 43415 and 44039)—108 ft (32.9 m) below top of lower Debolt Formation
Camarotoechia sp.
orthotetinid brachiopod

7115 ft (2170.1 m) (GSC loc. 43394)—110 ft (33.6 m) below top of lower Debolt Formation
Brachythyris sp.
Lithostrotion (*Siphonodendron*) *oculinum*

28. PACIFIC HIGHWAY (1) b-25-I/94-B-16

Microfacies between depths 7285 and 7355 ft (2221.9–2243.3 m)

7285 ft (2221.9 m) (GSC loc. 43387)—55 ft (16.8 m) below top of lower Debolt Formation
Slightly recrystallized wackestone; pressure solution
Foraminifera present to abundant
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranella sp.
Eoendothyranopsis ex gr. *E. spiroides*
cf. *Eoendothyranopsis prodigiosa*
Eoendothyranopsis spiroides
Eoforschia ex gr. *E. moelleri*
Globoendothyra sp.
Parathurammina sp.
Priscella ex gr. *P. prisca*
Pseudoammodiscus sp.
Septaglomospiranella sp.
Septatournayella sp.
Skippella redwallensis
Stacheia and *Stacheoides* sp.
cf. *Tournayella*? sp.

7289 ft (2223.1 m) (GSC loc. 43985)—59 ft (18 m) below top of lower Debolt Formation
Recrystallized wackestone; pressure solution
Foraminifera scarce
Calcisphaera laevis
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.

7303 ft (2227.4 m) (GSC loc. 43987)—73 ft (22.3 m) below top of lower Debolt Formation
Silicified, recrystallized wackestone
Foraminifera scarce
Brunsia sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7307 ft (2228.6 m) (GSC loc. 43346)—77 ft (23.5 m) below top of lower Debolt Formation
Bioclastic wackestone
Foraminifera present
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranella recta
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis hinduensis
Eoendothyranopsis spiroides
Eoforschia ex gr. *E. moelleri*
Globoendothyra sp.
Globoendothyra baileyi bridgensis
cf. *Irregularina*? sp.
Koninckopora sp.
Parathurammina sp.
Proninella sp.
Stacheia and *Stacheoides* sp.

7311 ft (2229.9 m) (GSC loc. 43357)—81 ft (24.7 m) below top of lower Debolt Formation
Silicified, slightly dolomitized, recrystallized bioclastic wackestone
Foraminifera scarce

Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*

7315 ft (2231.1 m) (GSC loc. 43984)—85 ft (25.9 m) below top of lower Debolt Formation
Silicified, slightly dolomitized, recrystallized bioclastic wackestone
Foraminifera scarce
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7316 ft (2231.4 m) (GSC loc. 43363)—86 ft (26.2 m) below top of lower Debolt Formation
Crinoidal packstone and bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Endothyranella sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
cf. *Irregularina*? sp.
Latiendothyra sp.
Parathurammina sp.

7317 ft (2231.7 m) (GSC loc. 43365)—87 ft (26.5 m) below top of lower Debolt Formation
Silicified, slightly dolomitized, recrystallized bioclastic wackestone
Foraminifera very scarce
Eoendothyranopsis ex gr. *E. spiroides*

7325 ft (2234.1 m) (GSC loc. 43356)—95 ft (29 m) below top of lower Debolt Formation
Silicified bioclastic wackestone; pressure solution
Foraminifera scarce
Calcisphaera pachysphaerica
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.

7330 ft (2235.7 m) (GSC loc. C-2190)—100 ft (30.5 m) below top of lower Debolt Formation
Wackestone and crinoidal packstone; pressure solution
Foraminifera scarce
Eoendothyranopsis spiroides

7333 ft (2236.6 m) (GSC loc. 43362)—103 ft (31.4 m) below top of lower Debolt Formation
Bioclastic packstone-grainstone
Foraminifera present to abundant
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranella recta
cf. primitive *Endothyranopsis*? sp.
Eoendothyranopsis ex gr. *E. rara*
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis hinduensis
Eoendothyranopsis spiroides
Eoforschia ex gr. *E. moelleri*
Globoendothyra sp.
Parathurammina ex gr. *P. suleimanovi*
Planoendothyra sp.
Skippella sp.
Skippella redwallensis

7347 ft (2240.8 m) (GSC loc. 43981)—117 ft (35.7 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7352 ft (2242.4 m) (GSC loc. 43349)—122 ft (37.2 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone; pressure solution
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Globoendothyra baileyi bridgensis
Stacheia and *Stacheoides* sp.

7354 ft (2243 m) (GSC loc. 43982)—124 ft (37.8 m) below top of lower Debolt Formation
Bioclastic "grainstone"
Foraminifera present to abundant
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. rara*
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoendothyranopsis thompsoni
Eoforschia ex gr. *E. moelleri*
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Globoendothyra paula
cf. *Irregularina*? sp.
Koninckopora sp.
Palaeotextularia sp.
Skippella sp.
Stacheia and *Stacheoides* sp.

7355 ft (2243.3 m) (GSC loc. 43372)—125 ft (38.1 m) below top of lower Debolt Formation
Bioclastic grainstone; spar cement
Foraminifera present to abundant
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
cf. primitive *Endothyranopsis* sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia sp.
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Stacheia and *Stacheoides* sp.

Age: Early Middle Viséan (Zone 12, probably at the top—Zone 12/13 boundary)

Macrofauna between depths 7254 and 7382 ft (2212.5–2251.5 m)

7254 ft (2212.5 m) (GSC loc. 43368)—24 ft (7.3 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7265 ft (2215.8 m) (GSC loc. 43367)—35 ft (10.7 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7269 ft (2217 m) (GSC loc. 43384)—39 ft (11.9 m) below top of lower Debolt Formation
?*Koninckophyllum* sp.
Vesiculophyllum sp.

7275 ft (2218.9 m) (GSC loc. 43370)—45 ft (13.7 m) below top of lower Debolt Formation
Caninia sp.
Vesiculophyllum sp.
?*Zaphriphyllum* sp.

7276 ft (2219.2 m) (GSC loc. 43360)—46 ft (14 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7277 ft (2219.5 m) (GSC loc. 43380)—47 ft (14.3 m) below top of lower Debolt Formation
Vesiculophyllum sp.

7280 ft (2220.4 m) (GSC loc. 43371)—50 ft (15.3 m) below top of lower Debolt Formation
Amplexizaphrentis sp.
Vesiculophyllum sp.

7285 ft (2221.9 m) (GSC loc. 43387)—55 ft (16.8 m) below top of lower Debolt Formation
Caninia sp.
Lithostrotion (*Siphonodendron*) *oculinum*

7289 ft (2223.1 m) (GSC loc. 43366)—59 ft (18 m) below top of lower Debolt Formation
Zaphriphyllum sp.

7302 ft (2227.1 m) (GSC loc. 43361)—72 ft (22 m) below top of lower Debolt Formation
Lophophyllum? *proteus*
Lithostrotion (*Siphonodendron*) sp.

7304 ft (2227.7 m) (GSC loc. 43358)—74 ft (22.6 m) below top of lower Debolt Formation
Zaphriphyllum sp.

7307 ft (2228.6 m) (GSC loc. 43359)—77 ft (23.5 m) below top of lower Debolt Formation
Syringopora sp.
?*Zaphriphyllum* sp.

7311 ft (2229.9 m) (GSC loc. 43357)—81 ft (24.7 m) below top of lower Debolt Formation
Lithostrotion (*Siphonodendron*) *sinuosum*
Syringopora sp.
Vesiculophyllum sp.
Zaphriphyllum cf. *Z. disseptum*

7316 ft (2231.4 m) (GSC loc. 43363)—86 ft (26.2 m) below top of lower Debolt Formation
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *oculinum*

7335 ft (2237.2 m) (GSC loc. 43375)—105 ft (32 m) below top of lower Debolt Formation
?*Amplexizaphrentis* sp.
Syringopora sp.

7342 ft (2239.3 m) (GSC loc. 43355)—112 ft (34.2 m) below top of lower Debolt Formation
?*Amplexizaphrentis* sp.
Lithostrotion (*Siphonodendron*) sp.

7364 ft (2246 m) (GSC loc. 43391)—134 ft (40.9 m) below top of lower Debolt Formation
Amplexizaphrentis sp.

7380 ft (2250.9 m) (GSC loc. 43381)—150 ft (45.8 m) below top of lower Debolt Formation
Ekvasophyllum cf. *E. inclinatum*

7382 ft (2251.5 m) (GSC loc. 43374)—152 ft (46.4 m) below top of lower Debolt Formation
Lophophyllum? *proteus*

Microfacies between depths 7390 and 7475 ft (2254–2279.9 m)

7390 ft (2254 m) (GSC loc. 43986)—160 ft (48.8 m) below top of lower Debolt Formation
Silicified mudstone; slight dolomitization
Foraminifera very scarce
Calcisphaera sp.
Globoendothyra sp.

7391 ft (2254.3 m) (GSC loc. 43348)—161 ft (49.1 m) below top of lower Debolt Formation
Slightly recrystallized bioclastic wackestone; pressure solution
Foraminifera very scarce
Endothyra sp.
Globoendothyra sp.

7395 ft (2255.5 m) (GSC loc. 43978)—165 ft (50.3 m) below top of lower Debolt Formation
Silicified bioclastic wackestone; pressure solution
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Eostaffella sp.
Globoendothyra sp.
Globoendothyra baileyi bridgensis
Skippella redwallensis
Stacheoides sp.

7397 ft (2256.1 m) (GSC loc. 43351)—167 ft (50.9 m) below top of lower Debolt Formation
Slightly recrystallized bioclastic wackestone; pressure solution
Foraminifera very scarce
Endothyra sp.
Globoendothyra sp.

7398 ft (2256.4 m) (GSC loc. 43373)—168 ft (51.2 m) below top of lower Debolt Formation
Silicified bioclastic wackestone; pressure solution
Foraminifera very scarce
Globoendothyra sp.

7408 ft (2259.4 m) (GSC loc. 43352)—178 ft (54.3 m) below top of lower Debolt Formation
Bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.

7412 ft (2260.7 m) (GSC loc. 43345)—182 ft (55.5 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera very scarce
Endothyra sp.

7413 ft (2261 m) (GSC loc. 43344)—183 ft (55.8 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.

7422 ft (2263.7 m) (GSC loc. 43989)—192 ft (58.6 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Eoforschia sp.
Globoendothyra sp.

7426 ft (2264.9 m) (GSC loc. 43376)—196 ft (59.8 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone; pressure solution
Foraminifera very scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Globoendothyra sp.

7436 ft (2268 m) (GSC loc. 43990)—206 ft (62.8 m) below top of lower Debolt Formation
Silicified bioclastic wackestone
Foraminifera scarce
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Globoendothyra sp.
Pseudoammodiscus sp.
Stacheoides sp.

7451 ft (2272.6 m) (GSC loc. 43983)—221 ft (67.4 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoeondothyra sp.

7455 ft (2273.8 m) (GSC loc. 43980)—225 ft (68.6 m) below top of lower Debolt Formation
Recrystallized bioclastic wackestone; pressure solution
Foraminifera very scarce
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides

7467 ft (2277.4 m) (GSC loc. 43988)—237 ft (72.3 m) below top of lower Debolt Formation
Silicified bioclastic wackestone; pressure solution
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

7475 ft (2279.9 m) (GSC loc. 43379)—245 ft (74.7 m) below top of lower Debolt Formation
Silicified, slightly recrystallized bioclastic wackestone
Foraminifera scarce
Eoendothyranopsis sp.
Globoendothyra sp.

Age: Early Middle Viséan (Zone 12)

Macrofauna between depths 7418 and 7475 ft (2262.5–2279.9 m)

7418 ft (2262.5 m) (GSC loc. 43378)—188 ft (57.3 m) below top of lower Debolt Formation
Lophophyllum? *proteus*

7457 ft (2274.4 m) (GSC loc. 43386)—227 ft (69.2 m) below top of lower Debolt Formation
?*Zaphriphyllum* sp.

7474 ft (2279.6 m) (GSC loc. 43350)—244 ft (74.4 m) below top of lower Debolt Formation
Zaphriphyllum disseptum

7475 ft (2279.9 m) (GSC loc. 43379)—245 ft (74.7 m) below top of lower Debolt Formation
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *warreni*
Zaphriphyllum disseptum

29. WEST CANADIAN LILY LAKE c-81-F/94-G-2

Microfacies between depths 7994 and 8076 ft (2438.2–2463.2 m)

7994 ft (2438.2 m) (GSC loc. C-2191)—148 ft (45.1 m) below top of Debolt Formation
Pelmatozoan-intraclast packstone and grainstone
Foraminifera scarce
Calcisphaera sp.
Globoendothyra ex gr. *G. tomiliensis*
Tuberitina sp.

7997 ft (2439.1 m) (GSC loc. C-2192)—151 ft (46.1 m) below top of Debolt Formation
Slightly recrystallized, intraclastic packstone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Globoendothyra sp.
Stacheoides sp.

8005 ft (2441.5 m) (GSC loc. C-2193)—159 ft (48.5 m) below top of Debolt Formation
Intraclastic packstone
Foraminifera scarce
Calcisphaera sp.
Eoendothyranopsis sp.
Skippella redwallensis

8008 ft (2442.4 m) (GSC loc. 70434)—162 ft (49.4 m) below top of Debolt Formation
Pelmatozoan-brachiopod packstone and grainstone
Foraminifera present
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoforschia sp.
Globoendothyra sp.
Propermodiscus sp.
Stacheia and *Stacheoides* sp.
Tetrataxis sp.

8015 ft (2444.6 m) (GSC loc. C-2194)—169 ft (51.5 m) below top of Debolt Formation
Recrystallized bioclastic wackestone; sparite cement
Foraminifera abundant
Banffella banffensis

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia elegans
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranopsis compressa
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. rara* and *E. pressa*
Eoendothyranopsis macra
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Priscella ex gr. *P. prisca*
Skippella redwallensis
Stacheia and *Stacheoides* sp.

8018 ft (2445.5 m) (GSC loc. C-2195)—172 ft (52.5 m) below top of Debolt Formation
Bioclastic wackestone; sparite cement
Foraminifera present

Banffella banffensis
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia vulgaris
Eoendothyranopsis sp.
Eoforschia ex gr. *E. moelleri*
Stacheia and *Stacheoides* sp.

8020 ft (2446.1 m) (GSC loc. C-2196)—174 ft (53.1 m) below top of Debolt Formation
Recrystallized bioclastic wackestone
Foraminifera very scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.

8033 ft (2450.1 m) (GSC loc. C-2197)—187 ft (57 m) below top of Debolt Formation
Bioclastic wackestone; sparite cement
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra ex gr. *G. globulus*
Irregularina sp.

8034 ft (2450.4 m) (GSC loc. C-2198)—188 ft (57.3 m) below top of Debolt Formation
Lump-bearing bioclastic wackestone
Foraminifera present

Brunsia ex gr. *B. irregularis*
Brunsia lenensis
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Endothyranella sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
"*Eoendothyranopsis*"? *banffensis*
Eoendothyranopsis macra
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Priscella ex gr. *P. prisca*
Stacheia and *Stacheoides* sp.

8036 ft (2451 m) (GSC loc. 70435)—190 ft (58 m) below top of Debolt Formation
Silicified, dolomitic mudstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.

8053 ft (2456.2 m) (GSC loc. 70436)—207 ft (63.1 m) below top of Debolt Formation
Silicified, dolomitized bioclastic wackestone
Foraminifera scarce

Archaediscus sp.
Archaediscus ex gr. *A. krestovnikovi*
Endothyra sp.
Endothyranella sp.
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Globoendothyra cf. *G.* ex gr. *G. globulus*
Propermodiscus sp.
Stacheia and *Stacheoides* sp.

8076 ft (2463.2 m) (GSC loc. C-2199)—230 ft (70.2 m) below top of Debolt Formation
Lump-bearing bioclastic wackestone and oolitic packstone; lump grainstone
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. macra*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Priscella ex gr. *P. prisca*
Stacheia and *Stacheoides* sp.
Tetrataxis sp.

Age: Early Late Viséan (Zone 14)

Macrofauna between depths 7951 and 8049 ft (2425.1–2454.9 m)

7951 ft (2425.1 m) (GSC loc. 59371)—105 ft (32 m) below top of Debolt Formation

Lophophyllum? cf. *L.*? *proteus*

7961 ft (2428.1 m) (GSC loc. 59362)—115 ft (35.1 m) below top of Debolt Formation

Lithostrotionella cf. *L. banffensis*

8008 ft (2442.4 m) (GSC loc. 55776)—162 ft (49.4 m) below top of Debolt Formation

?*Aulopora* sp.

8040 ft (2452.2 m) (GSC loc. 59377)—194 ft (59.2 m) below top of Debolt Formation

?*Lithostrotionella* sp.

8049 ft (2454.9 m) (GSC loc. 59368)—203 ft (61.9 m) below top of Debolt Formation

Lithostrotionella cf. *L. banffensis*

Microfacies between depths 8369 and 8527 ft (2552.5–2600.7 m)

8369 ft (2552.5 m) (GSC loc. C-2200)—523 ft (159.5 m) below top of Debolt Formation
Slightly recrystallized pelmatozoan packstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra sp.

8384 ft (2557.1 m) (GSC loc. C-2201)—538 ft (164.1 m) below top of Debolt Formation
Pelmatozoan packstone
Foraminifera scarce

Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Globoendothyra sp.

8389 ft (2558.6 m) (GSC loc. C-2202)—543 ft (165.6 m) below top of Debolt Formation
Pelmatozoan packstone
Foraminifera scarce

Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoforschia sp.

8408 ft (2564.4 m) (GSC loc. C-2203)—562 ft (171.4 m) below top of Debolt Formation
Bioclastic wackestone
Foraminifera present

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis scitula
Eoforschia ex gr. *E. moelleri* (*E. nonconstricta*)
Globoendothyra ex gr. *G. tomiliensis*

8458 ft (2579.7 m) (GSC loc. C-2204)—612 ft (186.7 m) below top of Debolt Formation
Pelmatozoan-bryozoan packstone and grainstone
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
Eoforschia sp.
Priscella ex gr. *P. prisca*

8479 ft (2586.1 m) (GSC loc. C-2205)—633 ft (193.1 m) below top of Debolt Formation
Pelmatozoan-bryozoan packstone
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
Eoendothyranopsis sp.
Globoendothyra sp.

8486 ft (2588.2 m) (GSC loc. C-2206)—640 ft (195.2 m) below top of Debolt Formation
Intraclast packstone
Foraminifera present

Calcisphaera sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis prodigiosa
Eoendothyranopsis scitula
Eoforschia sp.

8491 ft (2589.8 m) (GSC loc. C-2207)—645 ft (196.7 m) below top of Debolt Formation
Pelletoidal wackestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyranella sp.
Parathurammina sp.

8493 ft (2590.4 m) (GSC loc. C-2208)—647 ft (197.3 m) below top of Debolt Formation
Bioclastic grainstone
Foraminifera present

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia ex gr. *E. moelleri*
Globoendothyra ex gr. *G. tomiliensis*
Globoendothyra paula
Irregularina sp.
Stacheoides tenuis

8527 ft (2600.7 m) (GSC loc. C-2209)—681 ft (207.7 m) below top of Debolt Formation
Cemented bioclastic wakestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Globoendothyra sp.

Age: Late Middle Viséan (Zone 13)

Macrofauna between depths 8359 and 8541 ft (2549.5–2605 m)

8359 ft (2549.5 m) (GSC loc. 59364)—513 ft (156.5 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

8361 ft (2550.1 m) (GSC loc. 59363)—515 ft (157.1 m) below top of Debolt Formation

fenestrate bryozoans
ostracodes indet.
Anthracospirifer bifurcatus (Hall)
"*Spirifer*" sp.

8391 ft (2559.3 m) (GSC loc. 59379)—545 ft (166.2 m) below top of Debolt Formation

?*Lithostrotion* (*Siphonodendron*) *whitneyi* of Meek—juvenile corallites only
Syringopora sp.

8398 ft (2561.4 m) (GSC loc. 59359)—552 ft (168.4 m) below top of Debolt Formation.

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek

8412 ft (2565.7 m) (GSC loc. 59376)—566 ft (172.6 m) below top of Debolt Formation

?*Ekvasophyllum* sp.
Syringopora sp.

8413 ft (2566 m) (GSC loc. 59366)—567 ft (172.9 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek
Syringopora sp.

8418 ft (2567.5 m) (GSC loc. 59367)—572 ft (174.5 m) below top of Debolt Formation

?Lithostrotion (Siphonodendron) whitneyi of Meek

8421 ft (2568.4 m) (GSC loc. 59358)—575 ft (175.4 m) below top of Debolt Formation

?Cyathaxonia sp.
?Ekvasophyllum sp.

8510 ft (2595.6 m) (GSC loc. 59374)—664 ft (202.5 m) below top of Debolt Formation

?Aulopora sp.

8527 ft (2600.7 m) (GSC loc. 59372)—681 ft (207.7 m) below top of Debolt Formation

Zaphriphyllum sp.

8531 ft (2602 m) (GSC loc. 59375)—685 ft (208.9 m) below top of Debolt Formation

Amplexizaphrentis sp.

8541 ft (2605 m) (GSC loc. 59361)—695 ft (212 m) below top of Debolt Formation

?Aulopora sp.

30. IMPERIAL SIKANNI CHIEF (1) b-92-D/94-I-4

Macrofauna between depths 3587 and 3592 ft (1094–1095.6 m)

3587 ft (1094 m) (GSC loc. 55794)—237 ft (72.3 m) below top of lower Debolt Formation

Brachythyris sp.
?Ekvasophyllum sp.
ostracodes indet.
pelecypod indet.

3592 ft (1095.6 m) (GSC loc. 43420)—242 ft (73.8 m) below top of lower Debolt Formation

Lithostrotion (Siphonodendron) oculinum

Age: Early to early Middle Viséan

Microfacies between depths 3592 and 3594.5 ft (1095.6–1096.3 m)

3592 ft (1095.6 m) (GSC loc. C-2210)—242 ft (73.8 m) below top of lower Debolt Formation
Slightly recrystallized bioclastic wackestone
Foraminifera present to abundant

Calcisphaera laevis
Calcisphaera pachysphaerica
cf. "*Cornuspira*"? sp.
Earlandia clavatula
Earlandia elegans
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Girvanella sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. baileyi*
"*Globoendothyra*" *trachida*
Latiendothyra sp.
Priscella ex gr. *P. prisca*
Stacheia and *Stacheoides* sp.
cf. *Uviella* sp.

3594.5 ft (1096.3 m) (GSC loc. C-2211)—244.5 ft (74.6 m) below top of lower Debolt Formation
Slightly recrystallized bioclastic wackestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.
Globoendothyra ex gr. *E. baileyi*
"*Globoendothyra*" *trachida*
Latiendothyra latispiralis
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. suleimanovi*
cf. *Planoendothyra* sp.
Priscella ex gr. *P. prisca*
Pseudoammodiscus sp.
Septatournayella sp.
"*Septatournayella*" *henbesti*
relict *Spinoendothyra* sp.
Stacheia and *Stacheoides* sp.
cf. *Uvatournayella* sp.
Vicinesphaera sp.

Age: Late Early Viséan (Zone 11)

Microfacies between depths 3846 and 3856 ft (1173–1176.1 m)

3846 ft (1173 m) (GSC loc. C-2212)—96 ft (29.3 m) below top of "Shunda" Formation
Bioclastic wackestone and epitaxial "grainstone"
Foraminifera present

Calcisphaera laevis
Earlandia elegans
Endothyra sp.
Latiendothyra sp.
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. paracushmani*
Parathurammina ex gr. *P. spinosa*
Parathurammina ex gr. *P. suleimanovi*
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella pseudocamerata
Spinoendothyra sp.
Spinoendothyra bellicosta
Spinoendothyra corona
Spinoendothyra spinosa
Tournayella sp.
Vicinesphaera sp.

3855.5 ft (1175.9 m) (GSC loc. 43425)—105.5 ft (32.2 m) below top of "Shunda" Formation
Silicified, recrystallized packstone and bioclastic wackestone and "grainstone"
Foraminifera present to abundant

Brunsiina sp.
Calcisphaera laevis
Carbonella sp.
Earlandia elegans
cf. *Eoforschia* sp.
Glomospiranella sp.
Latiendothyra sp.
Latiendothyra latispiralis
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella pseudocamerata
Spinoendothyra sp.
Spinoendothyra bellicosta
Spinoendothyra corona
Spinoendothyra spinosa
Spinotournayella tumula
Tuberendothyra sp.
Vicinesphaera sp.

3856 ft (1176.1 m) (GSC loc. C-2213)—106 ft (32.3 m) below top of "Shunda" Formation
Grainstone
Foraminifera scarce

Calcisphaera laevis
Earlandia elegans
Endothyra sp.
Latiendothyra sp.
Parathurammina ex gr. *P. cushmani*

Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. paracushmani*
Parathurammina ex gr. *P. suleimanovi*
Septabrunsiina sp.
Septatournayella sp.
Spinoendothyra spinosa
Tuberendothyra sp.
Vicinesphaera sp.

Age: Late Late Tournaisian (Zone 9)

Macrofauna between depths 3855.5 and 3858 ft (1175.9–1176.7 m)

3855.5 ft (1175.9 m) (GSC loc. 43425)—105.5 ft (32.2 m) below top of "Shunda" Formation
Brachythyris sp.
Prospira? *minnewankensis*
ostracodes indet.

3858 ft (1176.7 m) (GSC loc. 43429)—108 ft (32.9 m) below top of "Shunda" Formation
Vesiculophyllum sp.

Microfacies between depths 4107 and 4111 ft (1252.6–1253.9 m)

4107 ft (1252.6 m) (GSC loc. C-2214)—top of Pekisko Formation
Silicified, slightly recrystallized bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
Earlandia sp.

4111 ft (1253.9 m) (GSC loc. C-2215)—4 ft (1.2 m) below top of Pekisko Formation
Silicified, slightly recrystallized bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
cf. *Chernyshinella*
Earlandia sp.
Latiendothyra sp.
Rectoseptaglomospiranella sp.

Age: probably Middle Tournaisian (Zone 7)

Microfacies between depths 4446 and 4449 ft (1356–1356.9 m)

4446 ft (1356 m) (GSC loc. 43422)—293 ft (89.4 m) below top of Banff Formation
Quartz-bearing, argillaceous mudstone grading to recrystallized, dolomitic mudstone; rare pelmatozoans
Foraminifera very scarce
Earlandia minima

4449 ft (1356.9 m) (GSC loc. C-2216)—296 ft (90.3 m) below top of Banff Formation
Quartz-bearing, recrystallized and dolomitized mudstone; rare pelmatozoans
Foraminifera very scarce
Earlandia minima

Age: probably Middle Tournaisian (Zone 7 or "pre-7")

31. ALTAIR ET AL TENAKA d-82-L/94-J-2

Microfacies at depth 3087 ft (941.5 m)

3087 ft (941.5 m) (GSC loc. C-2218)—22 ft (6.7 m) below top of Debolt Formation
Silicified and slightly recrystallized bioclastic wackestone
Foraminifera present
Archaediscus sp.
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra ex gr. *E. bowmani*
Endothyra ex gr. *E. similis*
Endothyranella sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Eoforschia sp.
Globoendothyra cf. *G.* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Priscella ex gr. *P. prisca*
Pseudoammodiscus sp.
Tetrataxis sp.

Age: Early Late Viséan (Zone 14)

Microfacies at depth 3233 ft (986.1 m)

3233 ft (986.1 m) (GSC loc. C-2219)—168 ft (51.2 m) below top of Debolt Formation
Sparite-cemented pelmatozoan "grainstone"
Foraminifera present
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia ex gr. *E. moelleri*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Pseudoammodiscus sp.
Stacheia and *Stacheoides* sp.

Age: Late Middle Viséan (Zone 13)

Microfacies at depth 3865 ft (1178.8 m)

3865 ft (1178.8 m) (GSC loc. C-2220)—153 ft (46.7 m) below top of "Shunda" Formation
Dolomitized, recrystallized, bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Earlandia sp.
Endothyra sp.
Latiendothyra sp.
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. dagmarae*
Parathurammina ex gr. *P. suleimanovi*
Spinoendothyra spinosa
Vicinesphaera sp.

Age: probably Late Late Tournaisian (probably Zone 9)

Microfacies at depth 4498 ft (1371.9 m)

4498 ft (1371.9 m) (GSC loc. C-2221)—268 ft (81.7 m) below top of Banff Formation
Quartz-bearing, recrystallized and dolomitized bioclastic wackestone
Foraminifera scarce
cf. *Earlandia elegans*
Earlandia minima
Parathurammina sp.

Age: probably Middle Tournaisian (probably Zone "pre-7")

32. IMPERIAL KAHNTAH NO. (1) b-29-C/94-I-7

Microfacies between depths 2166 and 2168 ft (660.6–661.2 m)

2166 ft (660.6 m) (GSC loc. C-2222)—216 ft (65.9 m) below top of Debolt Formation
Silicified mudstone
Foraminifera scarce

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Eoendothyranopsis sp.
Globoendothyra baileyi
Pseudoammodiscus sp.
Spinoendothyra sp.
Tetrataxis sp.

2168 ft (661.2 m) (GSC loc. C-2223)—218 ft (66.5 m) below top of Debolt Formation
Recrystallized bioclastic wackestone and grainstone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia ex gr. *E. moelleri*
Eoparastaffella sp.
Globoendothyra baileyi
"*Globoendothyra*"? *trachida*
Latiendothyra sp.
Parathurammina sp.
Septatournayella kennedyi
Age: Early Early Viséan (Zone 10)

Macrofauna between depths 2172 and 2189 ft (662.5–667.6 m)

2172 ft (662.5 m) (GSC loc. 43458)—222 ft (67.7 m) below top of Debolt Formation
Syringopora sp.

2177 ft (664 m) (GSC loc. 43459)—227 ft (69.2 m) below top of Debolt Formation
Vesiculophyllum sp.

2180 ft (664.9 m) (GSC loc. 43456)—230 ft (70.2 m) below top of Debolt Formation
Syringopora sp.

2189 ft (667.6 m) (GSC loc. 43463)—239 ft (72.9 m) below top of Debolt Formation
?*Vesiculophyllum* sp.

Microfacies between depths 2459 and 2469 ft (750–753 m)

2459 ft (750 m) (GSC loc. C-2225)—222 ft (67.7 m) below top of "Shunda" Formation.
Bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Earlandia elegans
Latiendothyra sp.
Latiendothyra ex gr. *L. latispiralis*
Latiendothyra ex gr. *L. parakosvensis*
Septabrunsiina sp.
Septaglomospiranella dainae
Septatournayella sp.
Spinoendothyra sp. (rare)
Tuberendothyra sp.
Tuberendothyra tuberculata
Vicinesphaera sp.

2460 ft (750.3 m) (GSC loc. C-2226)—223 ft (68 m) below top of "Shunda" Formation
Slightly recrystallized bioclastic wackestone
Foraminifera present
Calcisphaera laevis sp.
Latiendothyra sp.
Tuberendothyra sp.

2464 ft (751.5 m) (GSC loc. 43461)—227 ft (69.2 m) below top of "Shunda" Formation
Bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Earlandia elegans
cf. *Irregularina*? sp.
Latiendothyra sp.
Latiendothyra ex gr. *L. latispiralis*
Latiendothyra parakosvensis
Parathurammina ex gr. *P. cushmani*
Parathurammina ex gr. *P. paracushmani*
Septabrunsiina sp.
Septaglomospiranella dainae
Septatournayella pseudocamerata
Spinoendothyra sp. (rare)
Tuberendothyra sp.
Tuberendothyra tuberculata
Vicinesphaera sp.

2465 ft (751.8 m) (GSC loc. C-2227)—228 ft (69.5 m) below top of "Shunda" Formation
Slightly dolomitized, recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Earlandia sp.
Latiendothyra sp.
Septabrunsiina sp.
Septaglomospiranella sp.
Tuberendothyra sp.
Tuberendothyra tuberculata
Tournayella sp.

2469 ft (753 m) (GSC loc. C-2228)—232 ft (70.8 m) below top of "Shunda" Formation
Pelmatozoan-bryozoan packstone
Foraminifera scarce
Calcisphaera laevis
Latiendothyra sp.
Tuberendothyra sp.
Age: Early Late Tournaisian (Zone 8)

Macrofauna between depths 2459 and 2460 ft (750–750.3 m)

2459 ft (750 m) (GSC loc. 43464)—222 ft (67.7 m) below top of "Shunda" Formation
coral genus and species indet. B of Sutherland

2460 ft (750.3 m) (GSC loc. 43467)—223 ft (68 m) below top of "Shunda" Formation
Homalophyllites sp.

Macrofauna between depths 2842 and 2846 ft (866.8–868 m)

2842 ft (866.8 m) (GSC loc. 43460)—220 ft (67.1 m) below top of Banff Formation
?*Camarotoechia* sp.
"*Spirifer*" cf. "*S.*" *platynotus* Weller

2846 ft (868 m) (GSC locs. 43462 and 43466)—224 ft (68.3 m) below top of Banff Formation
?*Martinia* sp.
"*Platyrachella*" *rutherfordi* (Warren)
Age: Middle Tournaisian

33. HB-IMPERIAL-UNION PADDY (1) a-49-B/94-H-16

Microfacies at depth 3137.5 ft (956.9 m)

3137.5 ft (956.9 m) (GSC loc. 43991)—51.5 ft (15.7 m) below top of Debolt Formation
Silicified, dolomitized bioclastic wackestone
Foraminifera very scarce
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.
Age: Viséan (undetermined zone)

Microfacies between depths 3363 and 3371 ft (1025.7–1028.2 m)

3363 ft (1025.7 m) (GSC loc. 43509)—277 ft (84.5 m) below top of Debolt Formation
Silicified, dolomitized bioclastic wackestone
Foraminifera very scarce
Calcisphaera pachysphaerica
Earlandia elegans
cf. *Earlandia minima*?
Eoendothyranopsis sp.
Eoforschia sp.

3364.5 ft (1026.2 m) (GSC loc. 43510)—278.5 ft (84.9 m) below top of Debolt Formation
Bioclastic packstone-grainstone
Foraminifera present to abundant
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
cf. *Dainella* sp.
Earlandia elegans
"*Endothyra*" sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia ex gr. *E. moelleri* (*E. nonconstricta*)
cf. primitive *Eoparastaffella*
Globoendothyra sp.
Globoendothyra baileyi
"*Globoendothyra*"? *trachida*
Latiendothyra sp.
Priscella ex gr. *P. prisca*
Pseudoammodiscus sp.
Septabrunsiina kennedyi
"*Septatournayella*" *henbesti*
Skippella sp.

3368 ft (1027.2 m) (GSC loc. 43512)—282 ft (86 m) below top of Debolt Formation
Silicified, recrystallized bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Eoendothyranopsis sp.

3371 ft (1028.2 m) (GSC loc. 43992)—285 ft (86.9 m) below top of Debolt Formation
Bioclastic packstone-grainstone
Foraminifera present to abundant
Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
cf. *Dainella* sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia sp.
cf. *Eoparastaffella* sp.
Eostaffella sp.
Globoendothyra baileyi
"*Globoendothyra*"? *trachida*
Priscella ex gr. *P. prisca*
Septabrunsiina sp.
"*Septatournayella*"? *henbesti*

Age: Late Early Viséan (Zone 11)

Macrofauna between depths 3359.5 and 3368 ft (1024.6–1027.2 m)

3359.5 ft (1024.6 m) (GSC loc. 43507)—273.5 ft (83.4 m) below top of Debolt Formation
fenestrate bryozoans
Prospira? sp.

3363 ft (1025.7 m) (GSC loc. 43509)—277 ft (84.5 m) below top of Debolt Formation
Lithostrotion (*Siphonodendron*) *oculinum*
Vesiculophyllum sp.

3368 ft (1027.2 m) (GSC loc. 43512)—282 ft (86 m) below top of Debolt Formation
Zaphriphyllum cf. *Z. disseptum*

Microfacies between depths 3815 and 3826 ft (1163.6–1166.9 m)

3815 ft (1163.6 m) (GSC loc. C-2233)—135 ft (41.2 m) below top of Pekisko Formation
Micritic packstone
Foraminifera very scarce
Earlandia sp.
Radiosphaerina sp.

3820 ft (1165.1 m) (GSC loc. C-2236)—140 ft (42.7 m) below top of Pekisko Formation
Slightly recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
cf. *Chernyshinella* sp.
Earlandia elegans
Earlandia minima
Latiendothyra sp.
Palaeospiroplectammina chernyshinensis
Rectoseptaglomospiranella sp.
Septaglomospiranella primaeva

3826 ft (1166.9 m) (GSC loc. C-2238)—4 ft (1.2 m) below top of Banff Formation
Quartz-bearing wackestone grading to pelmatozoan-bryozoan packstone
Foraminifera scarce
Calcisphaera laevis
Earlandia elegans
Earlandia minima
Latiendothyra sp.
Rectoseptaglomospiranella sp.
Septaglomospiranella sp.

Age: Middle Tournaisian (Zone 7)

Microfacies between depths 4055 and 4066 ft (1236.8–1240.1 m)

4055 ft (1236.8 m) (GSC loc. C-2240)—233 ft (71.1 m) below top of Banff Formation
Quartz-bearing wackestone grading to pelmatozoan-bryozoan packstone
Foraminifera scarce
Calcisphaera laevis
Earlandia sp.
Girvanella sp.
Latiendothyra ex gr. *L. parakosvensis*
Septabrunsiina sp.
Septaglomospiranella primaeva
Septatournayella sp.

4057.5 ft (1237.5 m) (GSC loc. C-2241)—235.5 ft (71.8 m) below top of Banff Formation
Quartz-bearing bioclastic wackestone
Foraminifera scarce
Bisphaera sp.
Brunsiina sp.
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella sp.

4061 ft (1238.6 m) (GSC loc. C-2242)—239 ft (72.9 m) below top of Banff Formation
Quartz-bearing bioclastic wackestone and grainstone
Foraminifera scarce
Brunsiina sp.
Calcisphaera sp.

Girvanella sp.
Latiendothyra parakosvensis
Parathurammina sp.
Septaglomospiranella sp.
Septatournayella sp.

4065 ft (1239.8 m) (GSC loc. C-2243)—243 ft (74.1 m) below top of Banff Formation
Pelmatozoan-bryozoan packstone and grainstone
Foraminifera scarce

Bisphaera sp.
Calcisphaera sp.
Earlandia sp.
Latiendothyra sp.
Septaglomospiranella
Septaglomospiranella primaeva
Septatournayella sp.

4066 ft (1240.1 m) (GSC loc. C-2244)—244 ft (74.4 m) below top of Banff Formation
Pelmatozoan-bryozoan packstone and grainstone
Foraminifera scarce

Bisphaera sp.
Calcisphaera laevis
cf. *Caligella* sp. (*Caligelloides*? sp.)
Earlandia sp.
Girvanella sp.
Latiendothyra ex gr. *L. parakosvensis*
Septabrunsiina sp.
Septaglomospiranella sp.
Septaglomospiranella primaeva
Septatournayella sp.

Age: Middle Tournaisian (Zone "pre-7")

34. MOBIL SIERRA d-92-D/94-I-14

Microfacies at depth 2035 ft (620.7 m)

2035 ft (620.7 m) (GSC loc. C-8927)—10 ft (3.1 m) below top of Debolt Formation

Calcisphaera sp.
Earlandia sp.
Eoendothyranopsis sp.
Eoforschia sp.
Globoendothyra sp.
Koninckopora sp.
Skippella sp.

Age: Middle Viséan (Zone 12 or 13?)

Microfacies between depths 2179 and 2220 ft (664.6–677.1 m)

2179 ft (664.6 m) (GSC loc. C-8928)—154 ft (47 m) below top of Debolt Formation (lower Debolt)

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoforschia sp.
cf. *Eoparastaffella*? sp.
"*Globoendothyra*" *trachida*
Priscella ex gr. *P. prisca*
Tournayella sp.

2186 ft (666.7 m) (GSC loc. C-8929)—161 ft (49.1 m) below top of Debolt Formation (lower Debolt)

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoforschia sp.
Globoendothyra sp.
Inflatoendothyra "*inflata*"
Parathurammina sp.

2193 ft (688.9 m) (GSC loc. C-8930)—168 ft (51.2 m) below top of Debolt Formation (lower Debolt)

Calcisphaera laevis
Calcisphaera pachysphaerica
cf. *Dainella*? sp.
Endothyra sp.
Eoforschia sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. baileyi*
Inflatoendothyra "*inflata*"
Parathurammina sp.
Spinoendothyra sp.
Tournayella sp.

2220 ft (677.1 m) (GSC loc. C-8931)—195 ft (59.5 m) below top of Debolt Formation (lower Debolt)

Calcisphaera laevis
Calcisphaera pachysphaerica
cf. *Dainella*? sp.
Earlandia sp.
Earlandia ex gr. *E. elegans*
Earlandia ex gr. *E. vulgaris*
Endothyra sp.
Eoforschia sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. baileyi*
Inflatoendothyra "*inflata*"
Parathurammina sp.
Priscella ex gr. *P. prisca*
"*Septatournayella*" *henbesti*
Spinoendothyra sp.

Age: Earliest Viséan (Zone 10)

35. GULF STATES CHUATSE CR. (1) b-14-I/94-J-16

Macrofauna between depths 1891 and 1910 ft (576.8–582.6 m)

1891 ft (576.8 m) (GSC loc. 55775)—1 ft (0.3 m) below top of Debolt Formation

Lithostrotion (*Siphonodendron*) *oculinum*

1898 ft (578.9 m) (GSC loc. 55772)—8 ft (2.4 m) below top of Debolt Formation

?*Caninia* sp.
?*Ekvasophyllum* sp.
Lithostrotion (*Siphonodendron*) *sp.*

1910 ft (582.6 m) (GSC loc. 55773)—20 ft (6.1 m) below top of Debolt Formation

?*Prospira* sp.

Age: Early to early Middle Viséan

36. SOBC CALSTAN YEKA a-69-D/91-P-10

Microfacies at depth 1298 ft (395.9 m)

1298 ft (395.9 m) (GSC locs. C-8932 and C-454)—46 ft (14 m) below top of "Shunda" Formation

Calcisphaera laevis
Earlandia sp.
Latiendothyra sp.
Latiendothyra latispiralis
Latiendothyra parakosvensis
cf. *Palaeospiroplectammina* sp.
Parathurammina sp.
Septabrunsiina sp.
Septatournayella sp.
Tuberendothyra sp.
Tuberendothyra tuberculata

Age: Early Late Tournaisian (Zone 8)

37. IOE-PAN AM VISCOUNT a-77-D/94-O-11

Microfacies between depths 8580 and 8590 ft (2616.9–2620 m)

8580 ft (2616.9 m) (GSC locs. C-2250 and C-427)—83 ft (25.3 m) below top of Debolt Formation
Silicified bioclastic wackestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

8585 ft (2618.4 m) (GSC loc. C-2251)—88 ft (26.8 m) below top of Debolt Formation
Dolomitized, recrystallized bryozoan-pelmatozoan packstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
"*Cornuspira*" sp.
Earlandia sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoforschia sp.

8590 ft (2620 m) (GSC locs. C-2252 and C-429)—93 ft (28.4 m) below top of Debolt Formation
Dolomitized bryozoan-pelmatozoan wackestone
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Globoendothyra ex gr. *G. tomiliensis*
Tetrataxis sp.

Age: Late Middle Viséan to Early Late Viséan (Zone 13 or 14)

38. NABESCHE RIVER SECTION (123°15'W;56°20'N)

Microfacies between 1906 and 2360 ft (581.3–719.8 m) below top of Prophet Formation

2360 ft (719.8 m) (GSC loc. 66375)
Recrystallized pelmatozoan wackestone; slight silicification
Foraminifera very scarce

Calcisphaera sp.
undetermined endothyroids

2186 ft (666.7 m) (GSC loc. 66376)
Highly recrystallized, silicified pelmatozoan packstone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.

2156–2158 ft (657.6–658.2 m) (GSC loc. 66378)
Recrystallized, silicified, pelmatozoan packstone
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.
Globoendothyra ex gr. *G. baileyi*
Stacheia and *Stacheoides* sp.

2118 ft (646 m) (GSC loc. 66380)
Recrystallized, silicified, pelmatozoan packstone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Globoendothyra sp.

1906 ft (581.3 m) (GSC loc. 66386)
Recrystallized, silicified, crinoidal, bioclastic wackestone
Foraminifera scarce

Calcisphaera sp.
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.

Age: probably Early Middle Viséan (probably Zone 12)

Macrofauna between 1906 and 2360 ft (581.3–719.8 m) below top of Prophet Formation

1906 ft (581.3 m) (GSC loc. 66386)
Zaphriphyllum cf. *Z. disseptum*

1941 ft (592 m) (GSC loc. 66385)
Zaphriphyllum cf. *Z. disseptum*

1949 ft (594.4 m) (GSC loc. 66384)
Zaphriphyllum cf. *Z. disseptum*

1954 ft (596 m) (GSC loc. 66383)
Zaphriphyllum cf. *Z. disseptum*

2110 ft (643.6 m) (GSC loc. 66382)
Zaphriphyllum disseptum?

2115 ft (645.1 m) (GSC loc. 66381)
Zaphriphyllum disseptum

2118 ft (646 m) (GSC loc. 66380)
?*Canadiphyllum* sp.
Zaphriphyllum cf. *Z. disseptum*

2153–2154 ft (656.7–657 m) (GSC loc. 66379)
Canadiphyllum cf. *C. knoxi*

2156–2158 ft (617.6–658.2 m) (GSC loc. 66378)
Canadiphyllum cf. *C. knoxi*
?*Zaphriphyllum* sp.

2186 ft (666.7 m) (GSC loc. 66376)
Canadiphyllum sp.
Zaphriphyllum sp.

2360 ft (719.8 m) (GSC loc. 66375)
Amplexizaphrentis sp.
Echinoconchus sp.

Microfacies between 607 and 1838 ft (185.1–560.6 m) below top of Prophet Formation

1838 ft (560.6 m) (GSC loc. 66387)
Recrystallized pelmatozoan packstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
cf. *Endothyranopsis*? sp.
Eoendothyranopsis sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. tomiliensis*

1808 ft (551.4 m) (GSC loc. 66388)
Silicified, recrystallized pelmatozoan packstone
Foraminifera scarce

Endothyra sp.
Globoendothyra sp.

1613–1621 ft (492–494.4 m) (GSC loc. 66389)
Bryozoan-pelmatozoan packstone
Foraminifera very scarce

Globoendothyra sp.

1392 ft (424.6 m) (GSC loc. 66394)
Silicified pelmatozoan packstone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

1351 ft (412.1 m) talus (GSC loc. 66395)
Silicified bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

897 ft (273.6 m) (GSC loc. 66401)
Pelmatozoan packstone, passing to lump-bearing bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis cf. *E. macra*
Eoforschia sp.
Globoendothyra sp.
Koninckopora sp.
Tetrataxis sp.

642 ft (195.8 m) (GSC loc. 66403)
Crinoidal wackestone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra ex gr. *E. bowmani*
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra ex gr. *G. tomiliensis*
Koninckopora sp.
Parathurammina sp.
Tetrataxis sp.

632 ft (192.8 m) (GSC loc. 66405)
Bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.
Tetrataxis sp.

607 ft (185.1 m) (GSC loc. 66406)
Bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyra ex gr. *E. similis*
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis cf. *E. macra*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis ex gr. *E. scitula*
Eoforschia sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. tomiliensis*
Koninckopora sp.
Tetrataxis sp.

Age: Late Middle Viséan (Zone 13, transition to Zone 14 in upper 100 ft [30.5 m])

Macrofauna between 632 and 1808 ft (192.8–551.4 m) below top of Prophet Formation

632 ft (192.8 m) (GSC loc. 66405)
Ekvasophyllum inclinatum

632 ft (192.8 m), rubble near outcrop (GSC loc. 66404)
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *warreni*

642 ft (195.8 m) (GSC loc. 66403)
Ekvasophyllum inclinatum

652 ft (198.9 m) (GSC loc. 66402)
Ekvasophyllum sp.

897 ft (273.6 m) (GSC loc. 66401)
?*Canadiphyllum* n. sp. (=cf. *Timania* of Macqueen and Bamber, 1968)
Ekvasophyllum sp.

1216 ft (370.9 m) (GSC loc. 66399)
Diphyphyllum sp.
Echinoconchus sp.

1411 ft (430.4 m) (GSC loc. 66397)
Ekvasophyllum sp.

1351–1356 ft (412.1–413.6 m) (GSC loc. 66396)
?*Diphyphyllum* sp.
Zaphriphyllum sp.

1351 ft (412.1 m), talus (GSC loc. 66395)
Lithostrotion (*Siphonodendron*) *sinuosum*

1392 ft (424.6 m) (GSC loc. 66394)
Zaphriphyllum sp.

1456 ft (444.1 m) (GSC loc. 66391)
?*Canadiphyllum* n. sp.
Diphyphyllum sp.
?*Zaphriphyllum* sp.

1506 ft (459.3 m) (GSC loc. 66393)
Diphyphyllum sp.

1571 ft (479.2 m) (GSC loc. 66392)
Diphyphyllum sp.
Lithostrotion (*Siphonodendron*) *sinuosum*

1597 ft (487.1 m) (GSC loc. 66390)
Lithostrotion (*Siphonodendron*) *sinuosum*
Zaphriphyllum sp.

1613–1621 ft (492–494.4 m) (GSC loc. 66389)
?*Canadiphyllum* sp.
Ekvasophyllum sp.

1808 ft (551.4 m) (GSC loc. 66388)
?*Canadiphyllum* sp.

Microfacies between 156 and 435 ft (47.6–132.7 m) below top of Prophet Formation

435 ft (132.7 m) (GSC loc. 66407)
Slightly recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis macra
Koninckopora sp.
Tetrataxis sp.

358–361 ft (109.2–110.1 m) (GSC loc. 66409)
Recrystallized pelmatozoan packstone
Foraminifera scarce
Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis sp.

348–352 ft (106.1–107.4 m) (GSC loc. 66410)
Silicified, recrystallized, pelmatozoan packstone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis macra
Eoforschia sp.
Tetrataxis sp.

327–333 ft (99.7–101.6 m) (GSC loc. 66411)
Bioclastic wackestone
Foraminifera scarce
Calcisphaera pachysphaerica
Endothyra sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis macra
Stacheia and *Stacheoides* sp.

156 ft (47.6 m) (GSC loc. 66417)
Recrystallized bioclastic wackestone
Foraminifera scarce
Archaediscus sp.
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyra ex gr. *E. similis*
Endothyranopsis sp.
Eoendothyranopsis sp.
Priscella ex gr. *P. prisca*
Age: Early Late Viséan (Zone 14)

Macrofauna between 130 and 435 ft (39.7–132.7 m) below top of Prophet Formation

130 ft (39.7 m) (GSC loc. 66418)
Ekvasophyllum cf. *E. inclinatum*
E. cascadense

156 ft (47.6 m) (GSC loc. 66417)
Ekvasophyllum inclinatum

238 ft (72.6 m) (GSC loc. 66413)
Diphyphyllum cf. *D. venosum* Armstrong
Ekvasophyllum inclinatum Parks?

327–333 ft (99.7–101.6 m) (GSC loc. 66411)
Acrocyathus (*Acrocyathus*) *pennsylvanicum* (Shimer)
Ekvasophyllum inclinatum
Lithostrotion (*Siphonodendron*) *whitneyi* of Meek
L. (*S.*) *warreni* Nelson
L. (*S.*) sp.
Lithostrotionella banffensis (Warren)
L. birdi? Armstrong
Syringopora sp.
?*Striatifera* sp.

348–352 ft (106.1–107.4 m) (GSC loc. 66410)
?*Ekvasophyllum* sp.
Ekvasophyllum inclinatum

358–361 ft (109.2–110.1 m) (GSC loc. 66409)
?*Ekvasophyllum* sp.
Ekvasophyllum inclinatum
?*Striatifera* sp.

421 ft (128.4 m) (GSC loc. 66408)
Ekvasophyllum cascadense

435 ft (132.7 m) (GSC loc. 66407)
Ekvasophyllum cascadense

592–597 ft (180.6–182.1 m) (GSC loc. 66406)
Ekvasophyllum inclinatum
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *warreni*

Macrofauna between 1 and 29 ft (0.305–8.8 m) below top of Prophet Formation

1–2 ft (0.305–0.6 m) (GSC loc. 66422)
Ekvasophyllum cascadense

9–10 ft (2.7–3.1 m) (GSC loc. 66421)
Amplexizaphrentis sp.
Koninckophyllum cf. *K. magnificum* Thomson and Nicholson
Michelinia sp.

12–13 ft (3.7–4 m) (GSC loc. 66420)
Ekvasophyllum cascadense
E.? *harkeri*

29 ft (8.8 m) (GSC loc. 66419)
Ekvasophyllum inclinatum
Age: Early Late Viséan

Microfacies between 9 and 10 ft (2.7–3.1 m) below top of Prophet Formation

9–10 ft (2.7–3.1 m) (GSC loc. 66421)
Recrystallized bioclastic wackestone
Foraminifera present
Archaediscus sp.
Brunsia sp. (extremely abundant)
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Eoforschia sp.
Age: probably Early Late Viséan (probably Zone 14)—"*Brunsia*" facies

Macrofauna at 239 ft (72.9 m) above base of Golata Formation

239 ft (72.9 m) (GSC loc. 66427)
Ekvasophyllum cascadense
Age: Early Late Viséan

39. TRIMBLE LAKE SECTION (123°43′30″W;57°19′37″N)

footage below top of Prophet Formation

Microfacies between 16 and 112 ft (4.9–34.2 m)

16 ft (4.9 m) (GSC loc. 66527)
Slightly recrystallized bioclastic wackestone
Foraminifera scarce
Brunsia sp.
Calcisphaera sp.
Endothyra sp.
Pseudoammodiscus sp.

22 ft (6.7 m) (GSC loc. 66526)
Slightly recrystallized bioclastic wackestone
Foraminifera present
Brunsia sp. (very abundant)
Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Pseudoammodiscus sp.

112 ft (34.2 m) (GSC loc. 66522)
Pellet-bearing wackestone
Foraminifera scarce

Brunsia sp.
Calcisphaera sp.
Earlandia sp.
Endothyra sp.

Age: Early Late Viséan (probably upper part of Zone 14)—"*Brunsia*" facies

Macrofauna from 48 ft (14.6 m) below top of Prophet Formation

48 ft (14.6 m) (GSC loc. 66524)

Ekvasophyllum enclinotabulatum

40. BAT CREEK SECTION (TYPE SECTION OF PROPHET FORMATION, 123°37′W;57°47′N)

footage below top of Prophet Formation

Member C

Microfacies between 0 and 10 ft (0–3.1 m)

0–10 ft (0–3.1 m) (GSC loc. C-2295)
Silicified pelmatozoan packstone; pellets present
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
cf. *Eoendothyranopsis macra*
Eoendothyranopsis scitula
Globoendothyra sp.
Priscella ex gr. *P. prisca*
Stacheia and *Stacheoides* sp.

Age: latest Middle Viséan or earliest Late Viséan (upper part of Zone 13 or lower part of Zone 14)

Microfacies between 10 and 140 ft (3.1–42.7 m)

10–20 ft (3.1–6.1 m) (GSC loc. C-2296)
Recrystallized bioclastic wackestone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Stacheoides sp.

20–30 ft (6.1–9.2 m) (GSC loc. C-2297)
Recrystallized bioclastic wackestone; pellets abundant
Foraminifera scarce to present

Calcisphaera laevis
Colcisphaera pachysphaerica
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Globoendothyra ex gr. *G. tomiliensis*
Tetrataxis sp.

30–40 ft (9.2–12.2 m) (GSC loc. C-2298)
Slightly dolomitized, pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
cf. *Earlandia minima*
Endothyra sp.
Eoendothyranopsis sp.

40–50 ft (12.2–15.3 m) (GSC loc. C-2299)
Silicified and recrystallized pelmatozoan packstone; pellets present
Foraminifera present

Brunsia sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Endothyra ex gr. *E. bowmani*
Endothyranopsis sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. ermakiensis*
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis scitula
Eoforschia sp.
Globoendothyra sp.
Priscella ex gr. *P. prisca*
Tetrataxis sp.

50–60 ft (15.3–18.3 m) (GSC loc. C-2300)
Silicified wackestone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.
Eoendothyranopsis sp.
Globoendothyra sp.

60–70 ft (18.3–21.4 m) (GSC loc. C-2301)
Silicified bioclastic wackestone
Foraminifera not observed

70–80 ft (21.4–24.4 m) (GSC loc. C-2302)
Silicified bioclastic wackestone
Foraminifera not observed

80–86 ft (24.4–26.2 m) (GSC loc. C-2303)
Silicified bioclastic wackestone
Foraminifera not observed

86–90 ft (26.2–27.5 m) (GSC loc. C-2304)
Intraclastic, pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.
Eoforschia sp.

90–100 ft (27.5–30.5 m) (GSC loc. C-2305)
Pelmatozoan packstone
Foraminifera not observed

100–110 ft (30.5–33.6 m) (GSC loc. C-2306)
Pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.
cf. *Globoendothyra* ex gr. *G. globulus*
Globoendothyra ex gr. *G. tomiliensis*

110–120 ft (33.6–36.6 m) (GSC loc. C-2307)
Pelmatozoan, intraclastic packstone; pellets present
Foraminifera very scarce

Calcisphaera laevis
Calcisphaera pachysphaerica

Earlandia vulgaris
Endothyra sp.
Globoendothyra sp.
Priscella ex gr. *P. prisca*

120–130 ft (36.6–39.7 m) (GSC loc. C-2308)
Pelmatozoan packstone
Foraminifera not observed

130–140 ft (39.7–42.7 m) (GSC loc. C-2309)
Silicified bioclastic wackestone
Foraminifera not observed

Age: Late Middle Viséan (Zone 13)

Macrofauna between 1 and 68 ft (0.305–20.7 m)

1–15 ft (0.305–4.6 m) (GSC loc. 66587)

Acrocyathus (*Acrocyathus*) sp. cf. *A.* (*A.*) *shimeri*
?*Canadiphyllum* n. sp.
Ekvasophyllum inclinatum
Lithostrotionella mclareni

13–15 ft (4–4.6 m) (GSC loc. 66584)

?*Amplexizaphrentis* sp.
Ekvasophyllum sp.
Lithostrotionella mclareni
Ovatia sp.
?*Striatifera* sp.

45 ft (13.7 m) (GSC loc. 66585)

?*Canadiphyllum* n. sp.
Echinoconchus biseriatus

67–68 ft (20.4–20.7 m) (GSC loc. 66586)

?*Canadiphyllum* n. sp.
Lithostrotionella mclareni

Microfacies between 140 and 170 ft (42.7–51.9 m)

140–150 ft (42.7–45.8 m) (GSC loc. C-2310)
Pelmatozoan grainstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia clavatula
Earlandia elegans
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra ex gr. *G. tomiliensis*

150–160 ft (45.8–48.8 m) (GSC loc. C-2311)
Silicified pelmatozoan grainstone
Foraminifera scarce

Calcisphaera laevis
Earlandia sp.
Eoendothyranopsis ex gr. *E. spiroides*
Globoendothyra sp.

160–170 ft (48.8–51.9 m) (GSC loc. C-2312)
Pelmatozoan grainstone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis ex gr. *E. scitula*
Eoendothyranopsis ex gr. *E. spiroides*
Eoforschia sp.
Globoendothyra sp.

Age: transition from Early to Late Middle Viséan (transition between Zones 12 and 13)

Member B

Microfacies between 170 and 200 ft (51.9–61 m)

170–180 ft (51.9–55 m) (GSC loc. C-2313)
Silicified mudstone
Foraminifera not observed

180–190 ft (55–58 m) (GSC loc. C-2314)
Dolomitized and chertified mudstone
Foraminifera not observed

190–200 ft (58–61 m) (GSC loc. C-2315)
Silicified and dolomitized mudstone
Foraminifera not observed

Age: unknown (Foraminifera absent)

Microfacies between 200 and 360 ft (61–109.8 m)

200–210 ft (61–64.1 m) (GSC loc. C-2316)
Pelmatozoan packstone
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
crushed *Eoendothyranopsis* ex gr. *E. spiroides*

210–220 ft (64.1–67.1 m) (GSC loc. C-2317)
Pelmatozoan packstone; rare intraclasts
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.
Priscella ex gr. *P. prisca*

220–230 ft (67.1–70.2 m) (GSC loc. C-2318)
Silicified pelmatozoan packstone
Foraminifera not observed

230–240 ft (70.2–73.2 m) (GSC loc. C-2319)
Recrystallized pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.
Endothyra sp.
Eoendothyranopsis sp.

240–250 ft (73.2–76.3 m) (GSC loc. C-2320)
Silicified pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Globoendothyra sp.

250–260 ft (76.3–79.3 m) (GSC loc. C-2321)
Slightly recrystallized, bryozoan-pelmatozoan packstone
Foraminifera present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia sp.
Globoendothyra ex gr. *G. baileyi*
Globoendothyra baileyi bridgensis
Stacheia and *Stacheoides* sp.

260–270 ft (79.3–82.4 m) (GSC loc. C-2322)
Silicified, recrystallized bioclastic wackestone
Foraminifera not observed

270–280 ft (82.4–85.4 m) (GSC loc. C-2323)
Recrystallized pelmatozoan packstone
Foraminifera present

Brunsia sp.
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.
Eoendothyranopsis spiroides
Eoforschia sp.
Globoendothyra ex gr. *G. baileyi*
Stacheia and *Stacheoides* sp.

280–290 ft (85.4–88.5 m) (GSC loc. C-2324)
Dolomite
Foraminifera not observed

290–300 ft (88.5–91.5 m) (GSC loc. C-2325)
Silicified dolomite
Foraminifera not observed

300–310 ft (91.5–94.6 m) (GSC loc. C-2326)
Dolomite; ghosts of pelmatozoans
Foraminifera unidentifiable ghosts

310–320 ft (94.6–97.6 m) (GSC loc. C-2327)
Silicified crinoidal dolomite
Foraminifera scarce

Calcisphaera sp.
Earlandia sp.
Stacheia and *Stacheoides* sp.

320–330 ft (97.6–100.7 m) (GSC loc. C-2328)
Silicified, recrystallized, bioclastic wackestone
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Eoendothyranopsis ex gr. *E. spiroides*

330–340 ft (100.7–103.7 m) (GSC loc. C-2329)
Recrystallized, chertified, dolomitized, pelmatozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.

340–350 ft (103.7–106.8 m) (GSC loc. C-2330)
Silicified dolomite
Foraminifera not observed

350–360 ft (106.8–109.8 m) (GSC loc. C-2331)
Bryozoan, pelmatozoan packstone
Foraminifera scarce

Calcisphaera sp.
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra sp.

Age: Early Middle Viséan (Zone 12)

Macrofauna from 345 ft (105.2 m)

345 ft (105.2 m) (GSC loc. 66588)

Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *whitneyi* of Meek

Microfacies between 360 and 420 ft (109.8–128.1 m)

360–370 ft (109.8–112.9 m)
Dolomite
Foraminifera not observed

370–380 ft (112.9–115.9 m)
Dolomite
Foraminifera not observed

380–390 ft (115.9–119 m)
Dolomite
Foraminifera not observed

390–400 ft (119–122 m)
Dolomite
Foraminifera not observed

400–410 ft (122–125.1 m)
Silicified biomicrite
Foraminifera scarce

Calcisphaera sp.
Globoendothyra sp.

410–420 ft (125.1–128.1 m)
Silicified mudstone
Foraminifera not observed

420–430 ft (128.1–131.2 m)
Silicified mudstone
Foraminifera not observed

Age: unknown (insufficient foraminifers)

Microfacies between 430 and 450 ft (131.2–137.3 m)

430–440 ft (131.2–134.2 m) (GSC loc. C-2333)
Silicified, dolomitized bioclastic wackestone; recrystallized pelletoidal "grainstone"
Foraminifera scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Endothyra sp.
Globoendothyra sp.
Priscella prisca
Pseudotaxis ex gr. *P. eominima*
cf. *Stacheia* and *Stacheoides* (very scarce)
Stacheia? *skimoensis*

440–450 ft (134.2–137.3 m) (GSC loc. C-2334)
Silicified bioclastic wackestone; recrystallized pelletoidal "grainstone"
Foraminifera scarce to present

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Globoendothyra sp.
Globoendothyra baileyi
"*Globoendothyra*"? *trachida*
Priscella ex gr. *P. prisca*

Age: probably Late Early Viséan (probably Zone 11) or slightly younger

Microfacies between 450 and 620 ft (137.3–189.1 m)

450–460 ft (137.3–140.3 m) (GSC loc. C-2335)
Silicified bioclastic wackestone
Foraminifera not observed

460–470 ft (140.3–143.4 m) (GSC loc. C-2336)
Dolomite
Foraminifera not observed

470–480 ft (143.4–146.4 m)
Silicified mudstone
Foraminifera not observed

480–490 ft (146.4–149.5 m)
Silicified dolomite
Foraminifera not observed

490–500 ft (149.5–152.5 m) (GSC loc. C-2337)
Silicified bioclastic wackestone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.

500–510 ft (152.5–155.6 m) (GSC loc. C-2338)
Silicified bioclastic wackestone
Foraminifera very scarce

Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Endothyra sp.

510–520 ft (155.6–158.6 m)
Silicified dolomite
Foraminifera not observed

520–528 ft (158.6–161 m)
Silicified dolomite
Foraminifera not observed

528–540 ft (161–164.7 m)
Dolomite
Foraminifera not observed

540–548 ft (164.7–167.1 m)
Silicified dolomite
Foraminifera not observed

548–560 ft (167.1–170.8 m) (GSC loc. C-2339)
Silicified dolomite
Foraminifera very scarce
Calcisphaera laevis
Earlandia sp.

560–570 ft (170.8–173.9 m)
Dolomite
Foraminifera not observed

570–580 ft (173.9–176.9 m)
Silicified dolomite
Foraminifera not observed

580–590 ft (176.9–180 m)
Silicified dolomite
Foraminifera not observed

590–600 ft (180–183 m)
Silicified dolomite
Foraminifera not observed

610–620 ft (186.1–189.1 m)
Silicified micrite
Foraminifera not observed

Age: unknown (insufficient microfauna)

Microfacies between 620 and 670 ft (189.1–204.4 m)

620–630 ft (189.1–192.2 m) (GSC loc. C-2340)
Recrystallized bioclastic wackestone
Foraminifera scarce
Calcisphaera laevis
Earlandia clavatula
Earlandia elegans
Endothyra sp.

630–640 ft (192.2–195.2 m) (GSC loc. C-2341)
Silicified bioclastic wackestone
Foraminifera very scarce
Earlandia clavatula

640–650 ft (195.2–198.3 m) (GSC loc. C-2342)
Recrystallized bioclastic wackestone
Foraminifera very scarce
Calcisphaera sp.
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia elegans
Endothyra sp.

650–660 ft (198.3–201.3 m)
Silicified bioclastic wackestone
Foraminifera not observed

660–670 ft (201.3–204.4 m) (GSC loc. C-2343)
Silicified, bryozoan-pelmatozoan packstone
Foraminifera very scarce
Calcisphaera sp.
Calcisphaera laevis
Earlandia clavatula
Earlandia vulgaris

Age: latest Tournaisian or earliest Viséan (Zone 9 or 10)

Macrofauna between 620 and 660 ft (189.1–201.3 m)

620 ft (189.1 m) (GSC loc. 66589)
?Amplexizaphrentis sp.
Michelinia sp.
Quadratia sp.

660 ft (201.3 m) (GSC loc. 66590)
Echinoconchus sp.

Microfacies between 670 and 1120 ft (204.4–341.6 m)

670–680 ft (204.4–207.4 m)
Recrystallized bioclastic wackestone
Foraminifera not observed

680–690 ft (207.4–210.5 m)
Silicified bioclastic wackestone
Foraminifera not observed

690–700 ft (210.5–213.5 m)
Silicified, recrystallized bioclastic wackestone
Foraminifera not observed

700–710 ft (213.5–216.6 m)
Silicified mudstone
Foraminifera not observed

710–720 ft (216.6–219.6 m)
Silicified mudstone; spicules present
Foraminifera not observed

720–730 ft (219.6–222.7 m)
Silicified, slightly dolomitized bioclastic wackestone
Foraminifera not observed

730–739 ft (222.7–225.4 m)
Dolomitized chert; spicules present
Foraminifera not observed

739–750 ft (225.4–228.8 m)
Dolomite
Foraminifera not observed

750–760 ft (228.8–231.8 m) (GSC loc. C-2344)
Silicified bioclastic wackestone
Foraminifera very scarce (ghosts)
undeterminable endothyroids

760–770 ft (231.8–234.9 m)
Silicified, recrystallized bioclastic wackestone
Foraminifera not observed

770–780 ft (234.9–238 m)
Silicified, recrystallized bioclastic wackestone; spicules present
Foraminifera not observed

780–790 ft (238–241 m)
Recrystallized bioclastic wackestone
Foraminifera not observed

Member A

879–890 ft (268.1–271.5 m)
Silicified radiolarite; spicules present
Foraminifera not observed

890–900 ft (271.5–274.5 m)
Silicified spiculite; radiolarians present
Foraminifera not observed

900–910 ft (274.5–277.6 m)
Recrystallized, silicified wackestone; abundant spicules and ostracodes
Foraminifera not observed

975–984 ft (297.4–300.1 m)
Calcareous spiculite
Foraminifera not present

984-993 ft (300.1–302.9 m)
Calcareous spiculite
Foraminifera not observed

993–997 ft (302.9–304.1 m)
Silicified wackestone; spicules present
Foraminifera not observed

1085–1089 ft (331–332.1 m)
Silicified spicule-bearing bioclastic wackestone
Foraminifera not observed

1111–1120 ft (338.9–341.6 m)
Spiculite
Foraminifera not observed

Age: unknown (Foraminifera not observed)

41. MUSKWA RIVER SECTION (TYPE SECTION OF BESA RIVER FORMATION, 123°43′W;57°57′N)

footage above base of Prophet Formation, Member A

137–136 ft (41.8–41.5 m)
Spicule-bearing wackestone
Foraminifera not observed

129.5 ft (39.5 m)
Radiolarian- and spicule-bearing wackestone
Foraminifera not observed

129–126.5 ft (39.3–38.6 m)
Spicule-bearing wackestone
Foraminifera not observed

121–111 ft (36.9–33.9 m)
Spicule- and radiolarian-bearing wackestone
Foraminifera not observed

109–104 ft (33.2–31.7 m)
Radiolarian wackestone
Foraminifera not observed

104–86 ft (31.7–26.2 m)
Spiculite
Foraminifera not observed

86–70 ft (26.2–21.4 m)
Wackestone; rare spicules and ostracodes
Foraminifera not observed

68–65 ft (20.7–19.8 m)
Silicified wackestone; rare spicules
Foraminifera not observed

65–56 ft (19.8–17.1 m)
Silicified, spicule-bearing wackestone
Foraminifera not observed

34–24 ft (10.4–7.3 m)
Silicified, spicule-bearing wackestone
Foraminifera not observed

15–0 ft (4.6–0 m)
Spiculite
Foraminifera not observed

footage below top of Besa River Formation

22–30 ft (6.7–9.2 m)
Recrystallized, slightly dolomitized wackestone
Foraminifera not observed

81 ft (24.7 m)
Spiculite
Foraminifera not observed

143–167 ft (43.6–50.9 m)
Argillaceous wackestone
Foraminifera not observed

611–651 ft (186.4–198.6 m)
Recrystallized mudstone
Foraminifera not observed

712–732 ft (217.2–223.3 m)
Recrystallized mudstone; slight dolomitization
Foraminifera not observed

796–816 ft (242.8–248.9 m)
Recrystallized mudstone; slight dolomitization
Foraminifera not observed

Age: unknown (Foraminifera not observed)

Macrofauna from 401 ft (122.3 m) below top of Besa River Formation

538 ft (164.1 m) (GSC loc. 66700)

horn corals, undetermined—new genus?
?*Michelinia* sp.
Prospira? *minnewankensis*

Age: Middle to Late Tournaisian

Macrofauna from 752 ft (229.4 m) below top of Besa River Formation

889 ft (271.1 m) (GSC loc. 66701)

"*Platyrachella*" *rutherfordi*

Age: Middle Tournaisian

42. JACKFISH GAP SECTION (TYPE SECTION OF FLETT FORMATION, 123°55′W;61°06′N)

footage above base of Flett Formation; numbers in boldface correspond to unit numbers in the description of the type section given by Harker (1963, p. 33–37)

Microfacies between 120 and 398 ft (36.6–121.4 m)

120–131 ft (36.6–40 m) **5** (GSC loc. C-2253)
Silicified spiculite
Foraminifera not observed

244–249 ft (74.4–75.9 m) **9** (GSC loc. 68801)
Recrystallized spiculite
Foraminifera not observed

302–312 ft (92.1–95.2 m) **13** (GSC loc. 68802)
Recrystallized bioclastic wackestone
Foraminifera very scarce

Calcisphaera laevis
Earlandia elegans
cf. *Earlandia minima*
Parathurammina sp.

364–366 ft (111–111.6 m) **15** (GSC loc. C-2254)
Bryozoan-pelmatozoan packstone
Foraminifera not observed

380–398 ft (115.9–121.4 m) **17** (GSC loc. C-2255)
Bioclastic wackestone
Foraminifera not observed

Age: unknown (foraminiferal assemblage not diagnostic)

Macrofauna between 244 and 382 ft (74.4–116.5 m)

244–249 ft (74.4–75.9 m) **9** (GSC loc. 68801)

?*Fasciculophyllum* sp.
?*Dimegalasma* sp.
?*Perditocardinia* sp.
Prospira? *minnewankensis* (Shimer)
Schizophoria sp.
Spirifer cf. *S. rowleyi* Weller

304–314 ft (92.7–95.8 m) **13** (GSC loc. 68802)

Brachythyris sp.
Camarotoechia sp.
?*Ectochoristites* sp.
Eomartiniopsis sp.
Rhipidomella sp.
Syringopora sp.

380–382 ft (115.9–116.5 m) **16** (GSC loc. 68803)

Camarotoechia sp.
?*Dimegalasma* sp.
Lophophyllum? *proteus* Sutherland

Age: Late Tournaisian

Microfacies between 399 and 430 ft (121.7–131.2 m)

399–430 ft (121.7–131.2 m) **19** (GSC loc. C-2256)
Slightly recrystallized and dolomitized bioclastic wackestone
Foraminifera scarce

Calcisphaera laevis
Earlandia clavatula
Earlandia elegans
cf. *Earlandia minima*
Endothyra sp.
Septabrunsiina parakrainica
Septaglomospiranella dainae
Septatournayella sp.
Spinoendothyra sp.
Tetrataxis sp.
Tuberendothyra? sp.

Age: Late Late Tournaisian (Zone 9)

Microfacies between 435 and 626 ft (132.7–190.9 m)

435–441 ft (132.7–134.5 m) **21** (GSC loc. C-2257)
Silicified mudstone
Foraminifera not observed

464–466 ft (141.5–142.1 m) **23** (GSC loc. C-2258)
Bryozoan-pelmatozoan packstone
Foraminifera not observed

467–482 ft (142.4–147 m) **25** (GSC loc. C-2259)
Bioclastic wackestone
Foraminifera very scarce
Calcisphaera laevis
Earlandia sp.
Septaglomospiranella sp.

484–507 ft (147.6–154.6 m) **27** (GSC loc. C-2260)
Recrystallized bioclastic wackestone; slight dolomitization
Foraminifera very scarce
Earlandia clavatula
Earlandia elegans

507–525 ft (154.6–160.1 m) **29** (GSC loc. C-2261)
Slightly recrystallized pelmatozoan packstone
Foraminifera not observed

558–577 ft (170.2–176 m) **31** (GSC loc. C-2262)
Recrystallized, quartz-bearing wackestone
Foraminifera not observed

577–584 ft (176–178.1 m) **32** (GSC loc. C-2263)
Quartz-bearing bioclastic wackestone
Foraminifera not observed

594–616 ft (181.2–187.9 m) **34** (GSC loc. C-2264)
Recrystallized bioclastic wackestone; pellets present
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.

616–636 ft (187.9–194 m) **36** (GSC loc. C-2265)
Recrystallized bioclastic wackestone
Foraminifera not observed

636–641 ft (194–195.5 m) **38** (GSC loc. C-2266)
Recrystallized bioclastic wackestone
Foraminifera not observed

641–656 ft (195.5–200.1 m) **39** (GSC loc. C-2267)
Recrystallized bryozoan-pelmatozoan packstone
Foraminifera very scarce
Calcisphaera laevis
Earlandia sp.

Age: unknown (microfauna not diagnostic)

Macrofauna between 432 and 585 ft (131.8–178.4 m)

432 ft (131.8 m) **19** (GSC loc. 68804)
Vesiculophyllum sp.

433–437 ft (132.1–133.3 m) **20** (GSC loc. 68805)
Spirifer cf. *S. rowleyi*

500–503 ft (152.5–153.4 m) **27–28** (GSC loc. 68806)
?*Lophophyllum proteus*
Brachythyris sp.
?*Dimegalasma* sp.
Prospira? *minnewankensis*
Spirifer cf. *S. rowleyi*

585 ft (178.4 m) **32** (GSC loc. 68807)
Prospira? *minnewankensis*

Age: probably Late Tournaisian

Microfauna between 656 and 759 ft (200.1–231.5 m)

656–759 ft (200.1–231.5 m) **40** (GSC loc. C-2268)
681–706 ft (207.7–215.3 m), recrystallized, dolomitized wackestone
706–731 ft (215.3–223 m), recrystallized, pelmatozoan packstone
731–759 ft (223–231.5 m), micrite-bound packstone
Foraminifera present throughout
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
cf. *Earlandia minima*
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides* (scarce and primitive forms)
Eoforschia sp.
cf. *Eostaffella*? sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. baileyi*
Latiendothyra sp.
Priscella ex gr. *P. prisca*
Pseudotaxis ex gr. *P. eominima*
Septabrunsiina sp. (relict)
Septaglomospiranella sp. (relict)
"*Septatournayella*"(?) *henbesti*
Septatournayella pseudocamerata
Spinoendothyra (relict)
Tetrataxis ex gr. *T. conica*

Age: Early Early Viséan (Zone 10)

Macrofauna between 664 and 682 ft (202.5–208 m)

664 ft (202.5 m) **39** (GSC loc. 68808)
?*Dimegalasma* sp.
Prospira? *minnewankensis*

669–674 ft (204–205.6 m) **39** (GSC loc. 68809)
?*Dimegalasma* sp.
Prospira? *minnewankensis*
?*Reticulatia* sp.

682 ft (208 m) **40** (GSC loc. 68810)
Prospira? *minnewankensis*
Reticulatia sp.

Microfacies between 767 and 857.5 ft (233.9–261.5 m)

767–812 ft (233.9–247.7 m) **42** (GSC loc. C-2269)
Pelmatozoan packstone rich in detrital quartz
Foraminifera not observed

812–813 ft (247.7–248 m) **43** (GSC loc. C-2270)
Pelmatozoan packstone rich in detrital quartz
Foraminifera not observed

818–818.5 ft (249.5–249.6 m) **45** (GSC loc. C-2271)
Bryozoan-pelmatozoan packstone
Foraminifera not observed

838–843 ft (255.6–257.1 m) **47** (GSC loc. C-2272)
Bryozoan-pelmatozoan packstone
Foraminifera not observed

856–857.5 ft (261.1–261.5 m) **49** (GSC loc. C-2273)
Bryozoan-pelmatozoan packstone
Foraminifera not observed

Age: unknown (no Foraminifera observed)

Macrofauna from 782 ft (238.5 m)

782 ft (238.5 m) **41** (GSC loc. 68811)
Liardiphyllum sp.
Lophophyllum? cf. *L.*? *proteus*

Age: Early Viséan

Microfacies between 862 and 944 ft (262.9–287.9 m)

862–864 ft (262.9–263.5 m) **51** (GSC loc. C-2274)
Pelmatozoan-bryozoan packstone
Foraminifera very scarce
Calcisphaera laevis
Calcisphaera pachysphaerica

Earlandia sp.
Endothyra sp.

869–870.5 ft (265–265.5 m) **53** (GSC loc. C-2275)
Pelmatozoan-bryozoan packstone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Globoendothyra ex gr. *G. baileyi*

874–876 ft (266.6–267.2 m) **55** (GSC loc. C-2276)
Bryozoan-pelmatozoan packstone
Foraminifera very scarce
Calcisphaera sp.
Earlandia sp.
Globoendothyra sp.

893–894 ft (272.4–272.7 m) **57** (GSC loc. C-2277)
Slightly recrystallized bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia sp.
Earlandia clavatula
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis sp.
Globoendothyra ex gr. *G. baileyi*
Priscella ex gr. *P. prisca*
Septabrunsiina sp.
Septaglomospiranella sp.
Septatournayella sp.
"*Septatournayella*"(?) *henbesti*

895–895.5 ft (273–273.1 m) **59** (GSC loc. C-2278)
Slightly recrystallized bioclastic wackestone
Foraminifera present
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia minima
Earlandia vulgaris
Endothyra sp.
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis spiroides
Eoforschia sp.
Eostaffella sp.
Globoendothyra ex gr. *G. baileyi*
Septabrunsiina sp.
Septaglomospiranella sp.
"*Septatournayella*"(?) *henbesti*
Stacheia and *Stacheoides* sp.
Tetrataxis sp.

900–907 ft (274.5–276.6 m) **61** (GSC loc. C-2279)
Recrystallized pelmatozoan bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Globoendothyra sp.
Stacheoides sp.

907–909 ft (276.6–277.2 m) **62** (GSC loc. C-2280)
Pelmatozoan packstone
Foraminifera scarce
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia vulgaris
Endothyra sp.
Globoendothyra sp.
Septabrunsiina sp.
Stacheia and *Stacheoides* sp.

909–944 ft (277.2–287.9 m) **63** (GSC loc. C-2281)
Recrystallized pelmatozoan-bryozoan packstone
Foraminifera scarce
Calcisphaera sp.
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra sp.
Globoendothyra sp.
Septabrunsiina sp.
Septatournayella sp.
Stacheia and *Stacheoides* sp.
Age: Late Early Viséan (Zone 11)

Macrofauna between 883 and 928 ft (269.3–283 m)

883 ft (269.3 m) **51** (GSC loc. 68813)
?*Amplexizaphrentis* sp.
Lophophyllum? cf. *L.*? *proteus*

928 ft (283 m) **61** (GSC loc. 68814)
Lithostrotion (*Siphonodendron*) *sinuosum*? (poorly preserved)

Microfacies between 944 and 1195 ft (287.9–364.5 m)

944–953 ft (287.9–290.7 m) **64** (GSC loc. C-2282)
Bryozoan-crinoidal packstone
Foraminifera not observed

1040–1093 ft (317.2–333.4 m) **73** (GSC loc. C-2283)
Silicified bioclastic wackestone
Foraminifera not observed

1093–1138 ft (333.4–347.1 m) **74** (GSC loc. C-2284)
Recrystallized bioclastic wackestone
Foraminifera not observed

1178–1195 ft (359.3–364.5 m) **78** (GSC loc. C-2285)
Bioclastic wackestone
Foraminifera scarce
Calcisphaera sp.
Earlandia sp.
Parathurammina sp.
Age: unknown (foraminiferal assemblage not diagnostic)

Microfacies between 1195 and 1227 ft (364.5–374.2 m)

1195–1227 ft (364.5–374.2 m) **79** (GSC loc. C-2286)
Slightly recrystallized bioclastic "grainstone"
Foraminifera abundant
Archaediscidae
Calcisphaera laevis
Calcisphaera pachysphaerica
Earlandia clavatula
Earlandia elegans
Earlandia vulgaris
Endothyra ex gr. *E. bowmani*
Endothyranella sp.
Endothyranopsis sp.
Eoendothyranopsis ex gr. *E. pressa* and *E. rara*
Eoendothyranopsis ex gr. *E. spiroides*
Eoendothyranopsis ex gr. *E. thompsoni*
Globoendothyra ex gr. *G. tomiliensis*
Parathurammina sp.
Skippella sp.
Stacheia and *Stacheoides* sp.
Tetrataxis sp.
Age: Late Middle Viséan (Zone 12/13 boundary)

Microfacies between 1227 and 1435 ft (374.2–437.7 m)

1227–1284 ft (374.2–391.6 m) **80** (GSC loc. C-2287)
Recrystallized, slightly dolomitized bioclastic wackestone
Foraminifera not observed

1284–1315 ft (391.6–401.1 m) **81** (GSC loc. C-2288)
Bryozoan-pelmatozoan packstone
Foraminifera scarce

Calcisphaera sp.
Endothyra sp.
Endothyranella sp.
Globoendothyra sp.

1329–1343 ft (405.3–409.6 m) **83** (GSC loc. C-2289)
Bryozoan-pelmatozoan packstone
Foraminifera scarce

Calcisphaera sp.
Endothyra sp.
Earlandia sp.
Stacheia and *Stacheoides* sp.

1346–1373 ft (410.5–418.8 m) **85** (GSC loc. C-2290)
Foraminifera scarce

Earlandia sp.
Globoendothyra ex gr. *G. tomiliensis*

1376–1381 ft (419.7–421.2 m) **87** (GSC loc. C-2291)
Dolomitized bryozoan-pelmatozoan packstone
Foraminifera scarce

Earlandia sp.
Endothyra sp.
Globoendothyra sp.
Globoendothyra ex gr. *G. tomiliensis*
Tetrataxis sp.

1381–1393 ft (421.2–424.9 m) **88** (GSC loc. C-2292)
Pelmatozoan-bryozoan packstone
Foraminifera very scarce

Calcisphaera sp.
Earlandia sp.
Globoendothyra sp.
Stacheia and *Stacheoides* sp.

1402–1414 ft (427.6–431.3 m) **90** (GSC loc. C-2293)
Dolomite
Foraminifera not observed

1419–1435 ft (432.8–437.7 m) **92** (GSC loc. C-2294)
Bioclastic wackestone
Foraminifera not observed

Age: Viséan (undetermined zone, foraminiferal assemblage non-diagnostic)

Macrofauna between 1227 and 1273 ft (374.2–388.3 m) above base of Flett Formation

1227–1242 ft (374.2–378.8 m) **80** (GSC loc. 68816)

Anthracospirifer bifurcatus
?*Ekvasophyllum* sp.
hapsiphyllid coral indet.
Lithostrotion (*Siphonodendron*) cf. *L.* (*S.*) *whitneyi* of Meek

1269–1273 ft (387–388.3 m) **81** (GSC loc. 68817)

Liardiphyllum sp.
spiriferid and rhynchonellid brachiopods

Age: Middle Viséan to Early Late Viséan

Macrofauna between 1336 and 1437 ft (407.5–438.3 m) above base of Flett Formation

1336 ft (407.5 m) **83** (GSC loc. 68889)

Lithostrotion (*Siphonodendron*) *whitneyi* of Meek
orthotetid brachiopod
?*Ovatia* sp.

1420 ft (433.1 m) **92** (GSC loc. 68819)

Amplexizaphrentis sp.
?*Zaphriphyllum* sp.

1436–1437 ft (438–438.3 m) **93** (GSC loc. 68819)

Amplexizaphrentis sp. C of Sutherland
?*Ekvasophyllum inclinatum*

Age: Late Middle to Early Late Viséan

Plates 1 to 6

Plate 1

"Shunda" Formation (upper)

Figures 1, 2. 105.5 ft (32.2 m) below top, depth 3855.5 ft (1175.9 m); Zone 9, Late Tournaisian, Osage age equivalent. Medium- to coarse-grained, epitaxial foraminifer-pelmatozoan "grainstone"; some brachiopod fragments, preservation of foraminifers variable and depends on the orientation of the test in relation to epitaxial overgrowth; foraminifers are *Septatournayella pseudocamerata* Lipina *in* Lebedeva and *Latiendothyra* sp.; ×31. Imperial Sikanni Chief (1) b-92-D/94-I-4; locality XXX; GSC loc. 43425; GSC type 39482; Mamet 121/21 (fig. 1) and 95/6 (fig. 2).

Figure 3. 96 ft (29.3 m) below top, depth 3846 ft (1173 m); Zone 9, Late Tournaisian, late Osage age equivalent. Pelmatozoan-parathuramminid-pellet "grainstone"; epitaxial overgrowth on the pelmatozoan simulates 'cement' and the grains appear to float; scarce bryozoans; parathuramminids are *Parathurammina* of the group *P. spinosa* (Williamson) and *Parathurammina* of the group *P. suleimanova* Lipina; ×38. Imperial Sikanni Chief (1) b-92-D/94-I-4; locality XXX; GSC loc. C-2212; GSC type 45942; Mamet 122/16.

Figure 4. 20 ft (6.1 m) below top, depth 6860 ft (2092.3 m); Zone 9, Late Tournaisian, upper Osage age equivalent. Lump-pellet-foraminifer grainstone with *Spinoendothyra spinosa* (Chernysheva); early marine cementation; ×121. Texaco NFA Boundary Lk. (1) 6-6-86-13W6; locality V; GSC loc. C-2168; GSC type 39480; Mamet 123/9.

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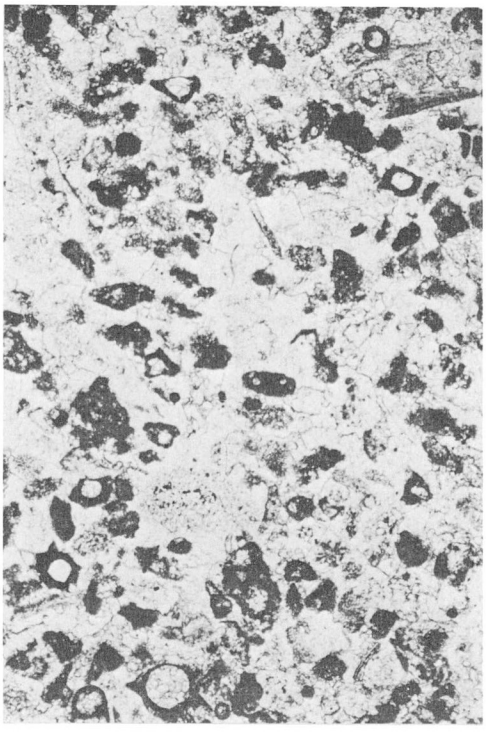

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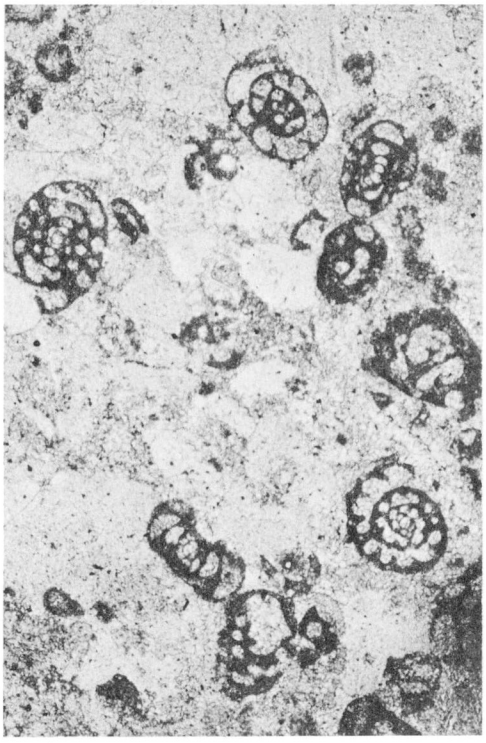
Plate 2

Debolt Formation (lower member)

Figures 1, 2. 124 ft (37.8 m) below top, depth 7354 ft (2243 m); Zone 12/13 boundary, Middle Viséan, Salem/St. Louis boundary age equivalent. Poorly sorted, unevenly grained, recrystallized, pelmatozoan-foraminifer "grainstone" (originally a packstone); some bryozoan fronds; foraminifers are *Eoendothyranopsis* of the group *E. rara* (Grozdilova *in* Lebedeva), *Eoendothyranopsis* aff. *E. thompsoni*, *Globoendothyra paula* (Vissarionova), *Skippella* sp., and *Eoforschia* of the group *E. moelleri* (Malakhova *in* Dain) (=*E. nonconstricta* [McKay and Green]); ×31. Pacific Highway (1) b-25-I/94-B-16; locality XXVIII; GSC loc. 43982; GSC type 39521; Mamet 128/9 (fig. 1) and 128/12 (fig. 2).

Figures 3, 4. 103 ft (31.4 m) below top, depth 7333 ft (2236.6 m); Zone 12/13 boundary, Middle Viséan, Salem/St. Louis boundary age equivalent. Poorly sorted, recrystallized, pelmatozoan-foraminifer packstone; some bryozoan fronds and brachiopod fragments; foraminifers are *Skippella* sp., *Skippella redwallensis* (Skipp *in* McKee and Gutschick), *Eoendothyranopsis* of the group *E. spiroides* (Zeller), *Endothyra* sp., and *Parathurammina* of the group *P. suleimanova* Lipina; scarce *Calcisphaera* sp. are also present; ×51 (fig. 3) and ×31 (fig. 4). Location as in figs. 1, 2; GSC loc. 43362; GSC type 39524; Mamet 128/27 (fig. 3) and 128/22 (fig. 4).



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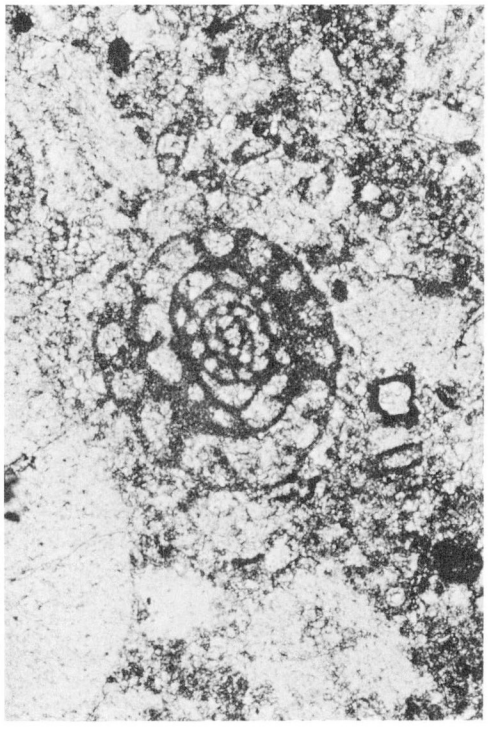

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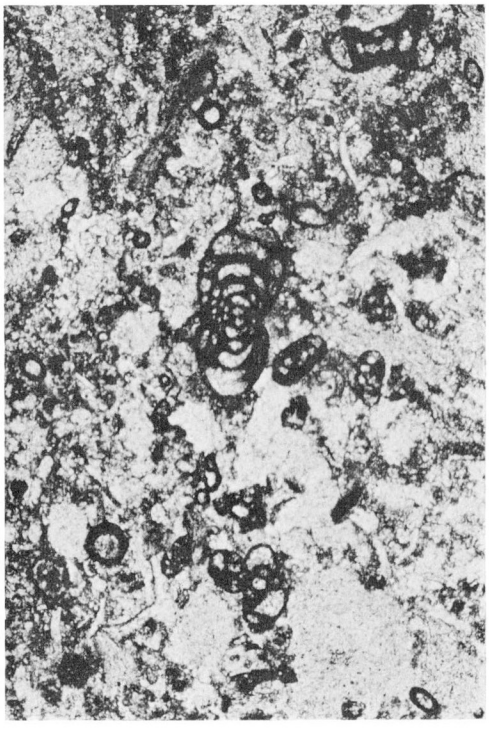


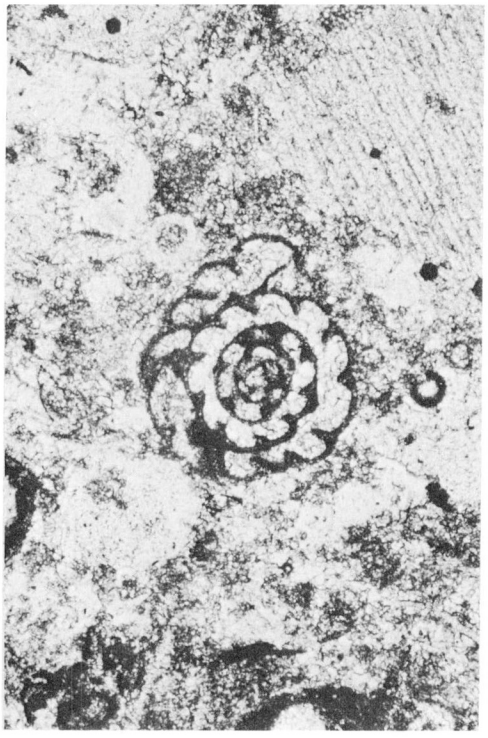
Plate 3

Debolt Formation (lower member, figs. 1–3; upper member, fig. 4)

Figure 1. 103 ft (31.4 m) below top, depth 7333 ft (2236.6 m); Zone 12/13 boundary, Middle Viséan, Salem/St. Louis boundary age equivalent. Recrystallized, poorly sorted, pelmatozoan-pellet-foraminifer packstone-grainstone; *Calcisphaera laevis* Williamson to the right of *Eoendothyranopsis* of the group *E. spiroides* (Zeller); ×51. Pacific Highway (1) b-25-I/94-B-16; locality XXVIII; GSC loc. 43362; GSC type 39525; Mamet 128/20.

Figures 2, 3. 92 ft (28.1 m) below top, depth 7097 ft (2164.6 m); Zone 12/13 boundary, Middle Viséan, Salem/St. Louis boundary age equivalent. Medium-grained, pelmatozoan-foraminifer "grainstone"; epitaxial overgrowth around the crinoid ossicles; original amount of matrix undetermined; some mud-coated grains; foraminifers are *Skippella redwallensis* (Skipp *in* McKee and Gutschick), *Eoendothyranopsis* sp., *Eoforschia* of the group *E. moelleri* (Malakhova *in* Dain) and *Earlandia* of the group *E. vulgaris* (Rauzer-Chernoussova and Reitlinger); ×31. Pacific Highway (3) a-69-I/94-B-16; locality XXVII; GSC loc. 43967; GSC type 39517; Mamet 124/23 (fig. 2) and 128/2 (fig. 3).

Figure 4. 61 ft (18.6 m) below top; depth 7054 ft (2151.5 m); Zone 13, Middle Viséan, St. Louis age equivalent. Poorly sorted, pellet-foraminifer wackestone; some lumps and brachiopod fragments; foraminifers are *Eoendothyranopsis thompsoni* (Anisgard and Campau), *Globoendothyra* sp.; *Eoendothyranopsis scitula* (Toomey) and *Endothyra* sp.; *Calcisphaera pachysphaerica* (Pronina) is common; ×31. Pacific Highway (2) a-47-I/94-B-16; locality XXVI; GSC loc. 43445; GSC type 39538; Mamet 95/16.



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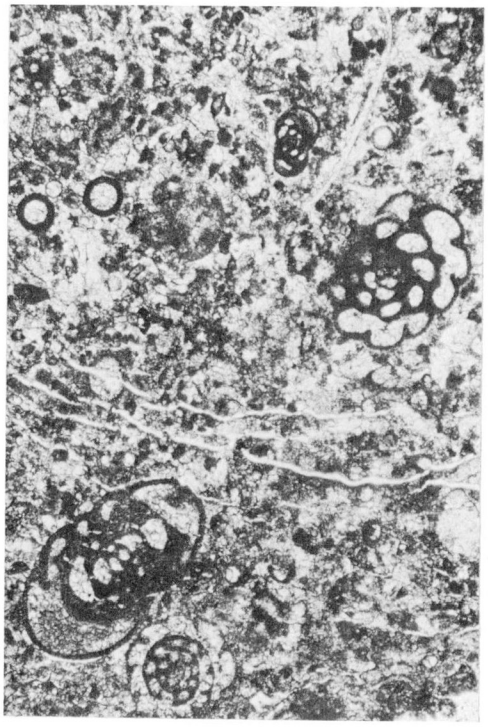

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Plate 4

Debolt Formation (upper member)

Figure 1. 134 ft (40.9 m) above base, depth 6871 ft (2095.7 m); Zone 13, Middle Viséan, St. Louis age equivalent. Well-sorted medium-grained, foraminiferal grainstone; foraminifers *Eoendothyranopsis thompsoni* (Anisgard and Campau), *Eoendothyranopsis* of the group *E. ermakiensis* (Grozdilova *in* Lebedeva), and *Eoendothyranopsis scitula* (Toomey) are mud filled and mud coated; ×38. Pacific Highway (3) a-69-I/94-B-16; locality XXVII; GSC loc. 43398; GSC type 39535; Mamet 93/32.

Figure 2. 230 ft (70.2 m) below top, depth 8076 ft (2463.2 m); Zone 14, Late Viséan, St. Louis age equivalent. Well-sorted, medium-grained, lump-foraminifer grainstone; some pelmatozoan ossicles and micrite-coated pelmatozoan plates; foraminifers are *Eoendothyranopsis* of the group *E. ermakiensis* (Grozdilova *in* Lebedeva), *Eoendothyranopsis scitula* (Toomey) and *Eoforschia* sp.; ×31. West Canadian Lily Lake c-81-F/94-G-2; locality XXIX; GSC loc. C-2199; GSC type 45943; Mamet 142/30.

Figure 3. 2 ft (0.6 m) below top, depth 5832 ft (1778.8 m); Zone 14, Late Viséan, St. Louis age equivalent. Finely crystalline, granular dolomite; ×31. Texaco NFA Boundary Lk. (1) 6-6-86-13W6; locality V; GSC loc. C-2162; Mamet 122/17.

Figure 4. 44 ft (13.4 m) below top, depth 5873 ft (1791.3 m); Zone 14, Late Viséan, St. Louis age equivalent. Poorly sorted, medium-grained, foraminifer-lump-pellet grainstone; foraminifers are *Globoendothyra paula* (Vissarionova), *Brunsia* sp., *Eoendothyranopsis* sp., *Endothyra* sp., and *Priscella* sp.; numerous sections of *Calcisphaera laevis* Williamson and *Calcisphaera pachysphaerica* (Pronina); ×31. Texaco NFA Boundary Lk. (1) 6-6-86-13W6; locality V; GSC loc. 70428; GSC type 39548; Mamet 96/19.

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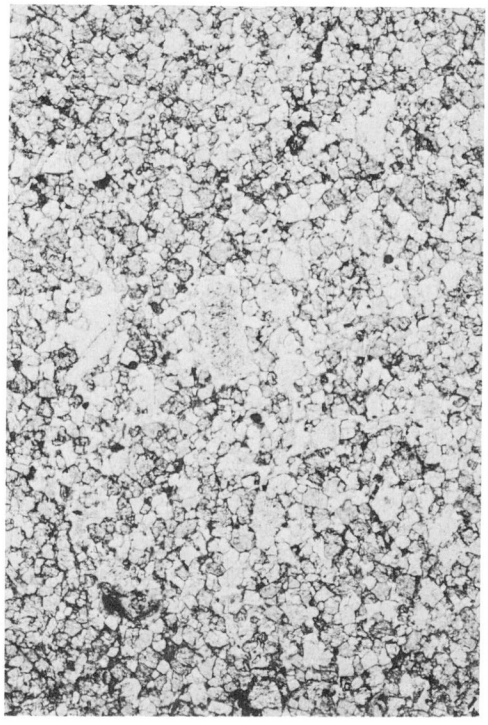

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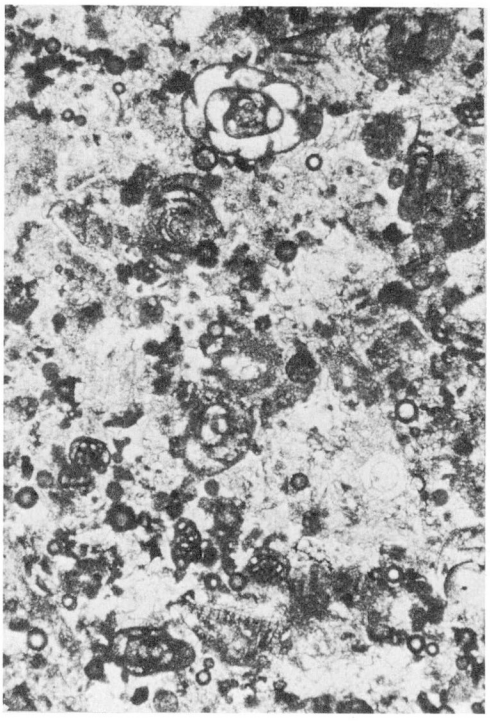


Plate 5

Figure 1. *Homalophyllites* sp., transverse section, ×4; "Shunda" Formation (middle), 223 ft (68 m) below top, depth 2460 ft (750.3 m); foraminiferal Zone 8, Early Late Tournaisian, Osage age equivalent. Imperial Kahntah No. (1) b-29-C/94-I-7; locality XXXII; GSC loc. 43467; GSC type 45944.

Figure 2. *Vesiculophyllum* sp., transverse section, ×1; Debolt Formation (lower), 227 ft (69.2 m) below top, depth 2177 ft (664 m); foraminiferal Zone 10, Early Early Viséan. Imperial Kahntah No. (1) b-29-C/94-I-7; locality XXXII; GSC loc. 43459; GSC type 45945.

Figure 3*a, b, c, d. Lithostrotion* (*Siphonodendron*) *oculinum* Sando, transverse (*a*) and longitudinal (*b, c, d*) sections, ×2; Debolt Formation, 110 ft (33.5 m) below top of lower member, depth 7115 ft (2170.1 m); foraminiferal Zone 12, or ?basal 13, Early Middle Viséan, possibly oldest Late Middle Viséan. Pacific Highway (3) a-69-I/94-B-16; locality XXVII; GSC loc. 43394; GSC type 45946.

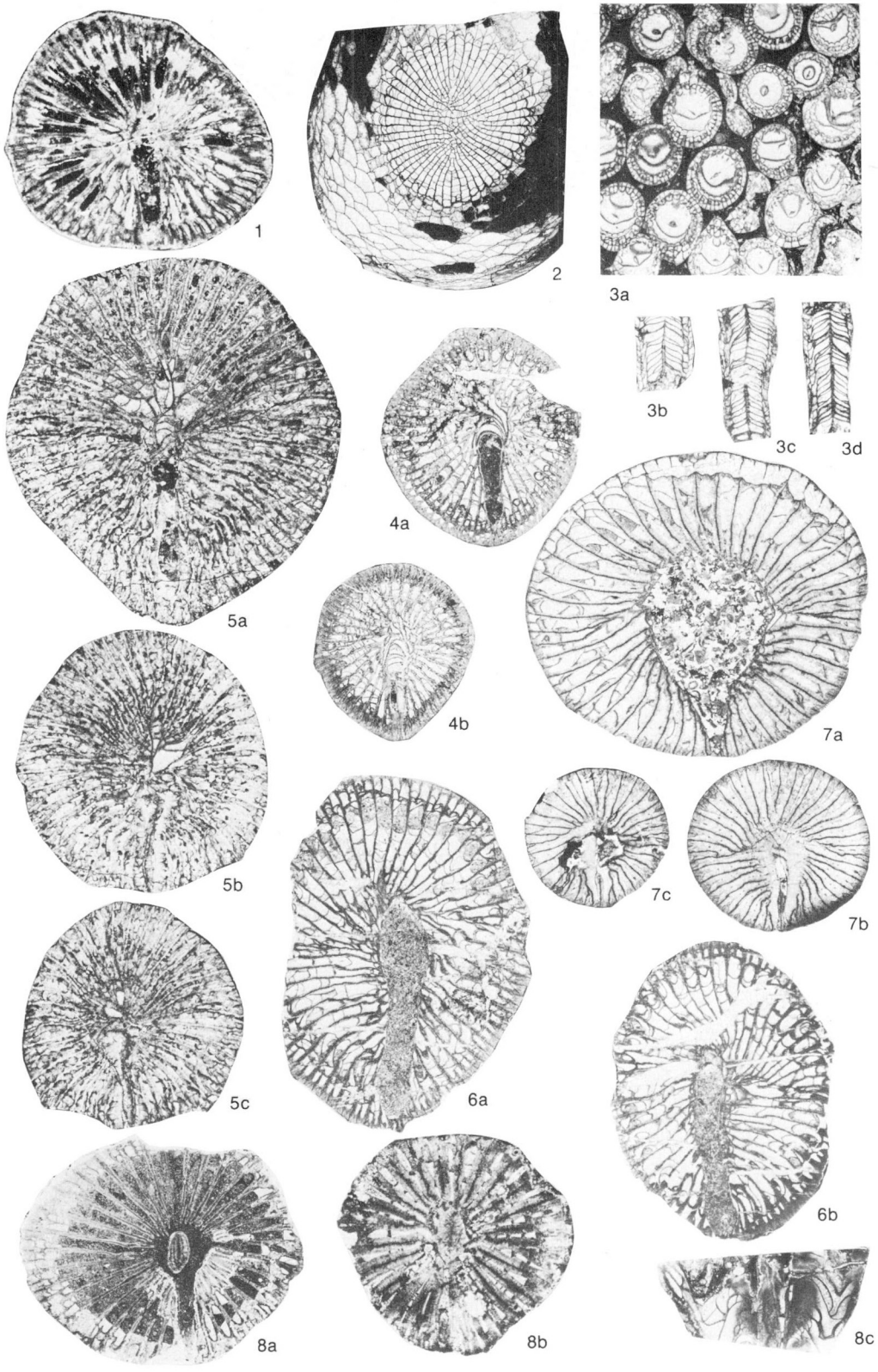
Figure 4*a, b. Zaphriphyllum disseptum* Sutherland, transverse section, ×2; Debolt Formation, 244 ft (74.4 m) below top of lower member, depth 7474 ft (2279.6 m); foraminiferal Zone 12, Early Middle Viséan. Pacific Highway (1) b-25-I/94-B-16; locality XXVIII; GSC loc. 43350; GSC type 45947.

Figure 5*a, b, c. Zaphriphyllum* cf. *Z. disseptum* Sutherland of Sando (1960), transverse sections, ×3; Debolt Formation, 81 ft (24.7 m) below top of lower member, depth 7311 ft (2229.9 m); foraminiferal Zone 12, near 12/13 boundary, Early Middle Viséan. Pacific Highway (1) b-25-I/94-B-16; locality XXVIII; GSC loc. 43357; GSC type 45948.

Figure 6*a, b. Canadiphyllum* sp. cf. *C. knoxi* Sutherland, transverse sections, ×2; Prophet Formation, 2153 to 2154 ft (656.7–657 m) below top, lower part of Member B; foraminiferal Zone 12?; probably Early Middle Viséan. Nabesche River Section; locality XXXVIII; GSC loc. 66379; GSC type 45949.

Figure 7*a, b.* ?*Canadiphyllum* n. sp., transverse sections, ×2; Prophet Formation, 67 to 68 ft (20.4–20.7 m) below top of Member C; foraminiferal Zone 13, Late Middle Viséan. Bat Creek Section (type section of Prophet Formation); locality XL; GSC loc. 66586; GSC type 45950.

Figure 8*a, b, c. Ekvasophyllum inclinatum* Parks, transverse sections, ×2 (*a*), ×4 (*b*), longitudinal section, ×2 (*c*); Prophet Formation, 29 ft (8.8 m) below top of Member C; foraminiferal Zone 14, early Late Viséan. Nabesche River Section; locality XXXVIII; GSC loc. 66419; GSC type 45951.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3a
3b
3c
3d
4a
4b
5a
5b
5c
6a
6b
7a
7b
7c
8a
8b
8c

Plate 6

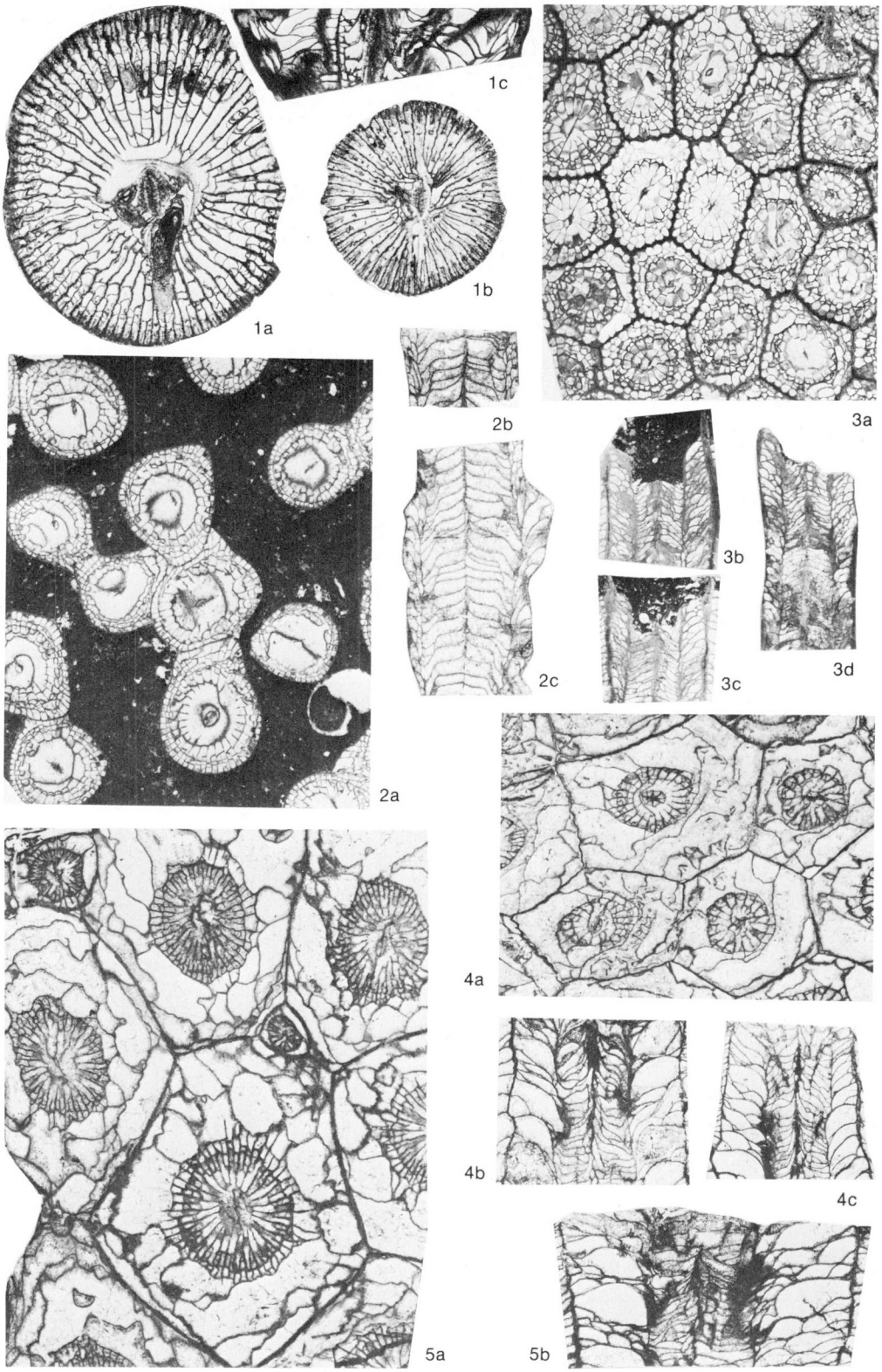
Figure 1*a, b, c. Ekvasophyllum cascadense* (Warren), transverse sections (*a, b*), longitudinal section (*c*), ×2; Prophet Formation, 12 to 13 ft (3.7–4 m) below top of Member C; foraminiferal Zone ?14, Early Late Viséan. Nabesche River Section; locality XXXVIII; GSC loc. 66420, GSC type 45952.

Figure 2*a, b, c. Lithostrotion* (*Siphonodendron*) *whitneyi* of Meek, transverse (*a*) and longitudinal (*b, c*) sections, ×2; Debolt Formation, 62 ft (18.9 m) below top, depth 7328 ft (2235 m); late Middle to early Late Viséan. Decalta Blueberry d-57-D/94-A-13; locality XXI; GSC loc. 70453; GSC type 45953.

Figure 3*a, b, c, d. Lithostrotionella mclareni* (Sutherland), transverse (*a*) and longitudinal (*b, c, d*) sections, ×3; Debolt Formation, 24 ft (7.3 m) below top, depth 5853 ft (1785.2 m); foraminiferal Zone 14, Early Late Viséan. Texaco NFA Boundary Lk. (1) 6-6-86-13W6; locality V; GSC loc. 55780; GSC type 45954.

Figure 4*a, b, c. Acrocyathus* (*Acrocyathus*) *pennsylvanicum* (Shimer), transverse (*a*) and longitudinal (*b, c*) sections, ×2; Prophet Formation, Member C, 327 to 333 ft (99.7–101.6 m) below top; foraminiferal Zone 14, Early Late Viséan. Nabesche River Section; locality XXXVIII; GSC loc. 66411; GSC type 45955.

Figure 5*a, b. Acrocyathus* (*Acrocyathus*) sp. cf. *A.* (*A.*) *shimeri* (Crickmay), transverse (*a*) and longitudinal (*b*) sections, ×2; Prophet Formation, Member C, 1 to 15 ft (0.305–4.6 m) below top; foraminiferal Zone 13, Late Middle Viséan. Bat Creek Section (type section of Prophet Formation); locality XL; GSC loc. 66587; GSC type 45956.


1c
1b
1a
3a
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