GEOLOGICAL SURVEY OF CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PAPER 63-39

RECONNAISSANCE OF THE ORDOVICIAN AND SILURIAN ROCKS OF NORTHERN YUKON TERRITORY

(Report and 4 figures)

B. S. Norford

Price, 75 cents

1964

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By

B. S. Norford

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Price 75 cents Catalogue No. M44-63 39

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ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1964

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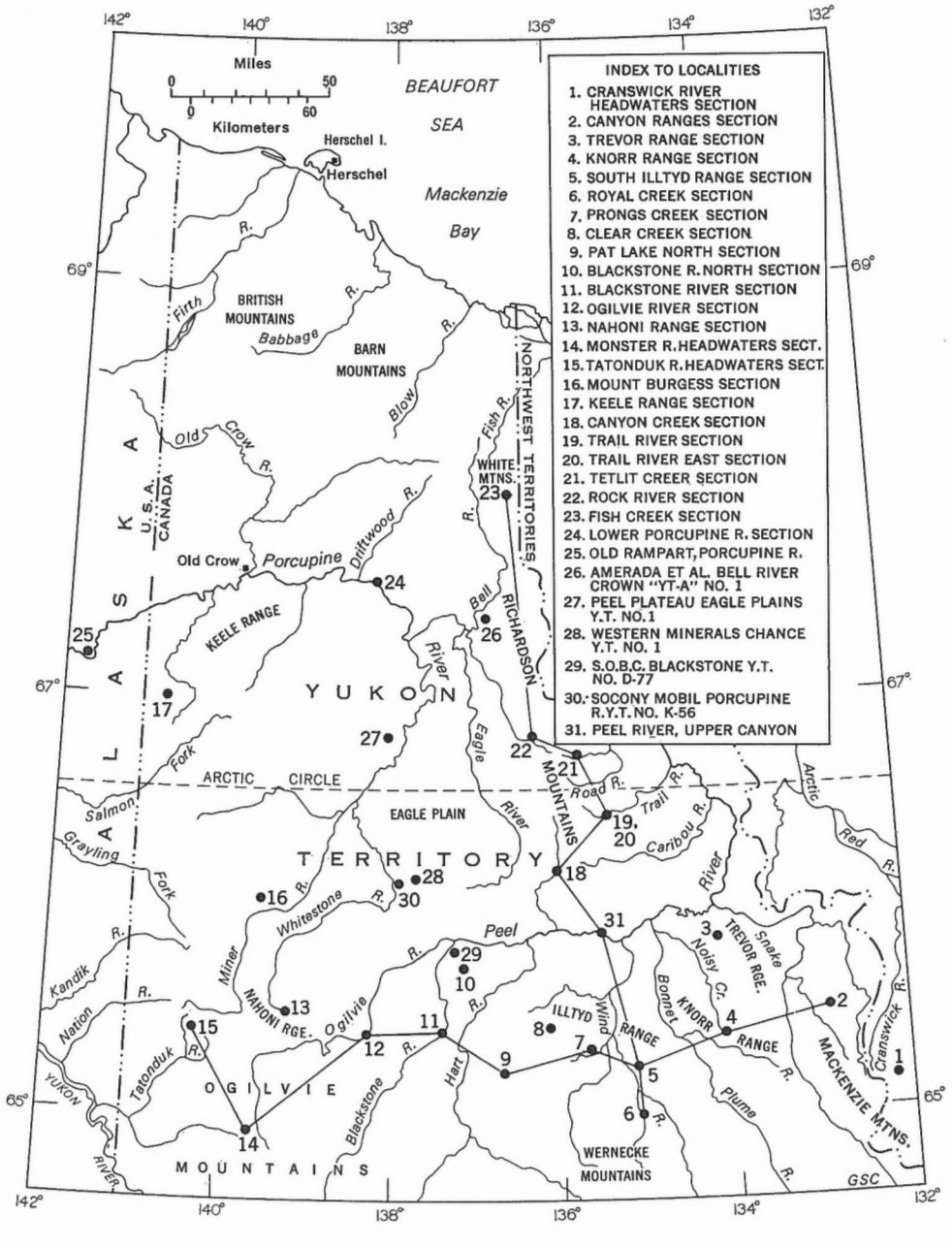

Figure 1. Localities and lines of sections

RECONNAISSANCE OF THE ORDOVICIAN AND SILURIAN ROCKS OF NORTHERN YUKON TERRITORY

INTRODUCTION

During the summer of 1962, the Geological Survey's helicopter-assisted Operation Porcupine mapped approximately 80,000 square miles of northern Yukon Territory and adjacent parts of the District of Mackenzie. The mapping program allowed stratigraphic reconnaissance; and this preliminary report on the Ordovician and Silurian Systems presents field data together with stratigraphic control allowed by the identification of some of the more important fossil collections.

Acknowledgments

A. W. Norris measured eight of the stratigraphic sections, and D. K. Norris, R. A. Price, and G. C. Taylor provided information on the distribution of the Ordovician and Silurian rock units. E. W. Bamber, A. W. Norris, and M. J. Copeland identified some of the fossil collections. Imperial Oil Limited kindly made available a description of the stratigraphic section measured on Rock River.

New Geographic Names

Named geographic features are very sparse in northern Yukon. The following new names used in this report, have been submitted to the Canadian Permanent Committee on Geographical Names: Canyon Creek, Tetlit Creek, Vunta Creek, White Mountains.

PREVIOUS WORK

Northern Yukon has been a site of vigorous exploration by oil companies for the past 10 years but very little of the resultant information has been published. Earlier studies were restricted to the Yukon-Alaska Boundary and the lower reaches of Peel River.

Cairnes first mapped the geology of the International Boundary between Yukon and Porcupine Rivers, and reported the presence of Ordovician and Silurian rocks of both carbonate and graptolitic facies (1914). Similar rocks had already been described from the Porcupine River west of the border (Kindle, 1908). Later Mertie mapped just west of the boundary and north of Tatonduk River and expanded Cairnes' stratigraphy (Mertie, 1933). Kobayashi later

described some Lower Ordovician trilobites from this same region (1936).

The thick sequence of graptolitic rocks of the southern Richardson Mountains was first recognized by Stelck. Graptolites that he collected from exposures in the canyons of Peel River established the presence of both Ordovician and Silurian faunas (Decker, Warren, and Stelck, 1947; Hume, 1954). Gabrielse (1957) demonstrated the outcrop of similar rocks in northern Richardson Mountains. In 1959, Martin gave a broad regional summary of Ordovician and Silurian stratigraphy of northern Yukon and adjacent District of Mackenzie, and later Raasch, Norford, and Wilson described (1961) a rich Lower Silurian fauna from the Prongs Creek Section. Jackson and Lenz (1962) published a major contribution on these graptolitic rocks, establishing a sequence of faunal zones for the Ordovician and Silurian.

Norris, Price, and Mountjoy recently prepared a geological map covering the area mapped by Operation Porcupine (1963), and Green and Roddick (1962) mapped the region immediately to the south. These studies have greatly assisted the interpretations presented here.

STRATIGRAPHY

All known Ordovician and Silurian rocks are thought to be marine and the broad pattern of sedimentation remained constant from late Cambrian to early Devonian time. The Ordovician Period opened with the Richardson Mountains being the site of deposition of the relatively deep water sediments of the Road River Formation, and with shallow banks of carbonate deposition extending over the rest of northern Yukon. Several of these carbonate banks persisted throughout Ordovician and Silurian time, but those of the Ogilvie Mountains subsided within the Ordovician, and carbonate sediments gave way to graptolitic deposits of the Road River Formation (Figure 2).

Established hiatuses within Ordovician and Silurian time are very few and can only be recognized by means of faunal discontinuities. No disconformity has been recognized at the Cambrian-Ordovician boundary. Similarly the Silurian-Devonian boundary falls between rocks of very similar lithologies and no significant physical break can be demonstrated. The top of the Silurian is arbitrarily drawn just above the highest beds with graptolites.

Lower Llandovery rocks are well represented in the Richardson Mountains but are absent in the Prongs Creek Section where middle or upper Llandovery Road River Formation rests paraconformably

on Upper Ordovician limestones (Section 7). This hiatus is surprisingly similar to that between the Cape Schuchert and Cape Calhoun Formations in northern Greenland (Poulsen, 1934).

Many of the standard cosmopolitan Wenlock and Ludlow graptolite faunas are apparently lacking in the Road River Formation. This could be the result of unfavourable living conditions, but may be due to unrecognized disconformities within the formation.

Unconformities and disconformities in Devonian and later Palaeozoic rocks, and associated erosion, have resulted in removal of subjacent Silurian and Ordovician rocks from parts of northern Yukon (Figures 3 and 4, in pocket).

Road River Formation

This unit was proposed by Jackson and Lenz (1962, pp. 32-36) and its type section is on Tetlit Creek, the major tributary of Road River (Figure 1, Locality 21). At this locality the formation consists of two extremely thick informal members: a lower member of limestones and argillaceous limestones, and a more recessive upper member of shales, argillaceous limestones, shaly argillites, and bedded cherts (Section 21). The upper member is about 2,550 feet thick, the lower member cannot be accurately measured due to the strong faulting so common within outcrop areas of the Road River Formation on the east flank of Richardson Mountains. At Rock River on the west flank, where faulting is also present but less important, the lower unit is about 6,200 feet thick and the upper member about 4,000 feet thick (Section 22).

The lower contact is the site of a fault at the type section, but at Trail River the boundary seems gradational with a thick sequence of shales and siltstones of Cambrian age. Dendroid graptolites and trilobites from the lower part of the lower member on Trail River (Section 19) show this part of the member to be Upper Cambrian (Dresbach), and the upper beds of this member are dated as Lower Ordovician (Tremadoc) at the type section (Jackson and Lenz, 1962, p. 36, unit 1b). Thus the Cambrian-Ordovician boundary falls within the lower member of the Road River Formation.

At the type section the upper contact of the formation is an angular unconformity beneath Devonian siliceous shales, and a disconformity is present at Trail River and Canyon Creek. The contact is covered in many stratigraphic sections, but at Royal Creek, Prongs Creek, and probably also on Porcupine River, the top of the unit is paraconformable with very recessive Devonian shales (Sections 6, 7, and 24). In these sections the top of the Road River Formation is

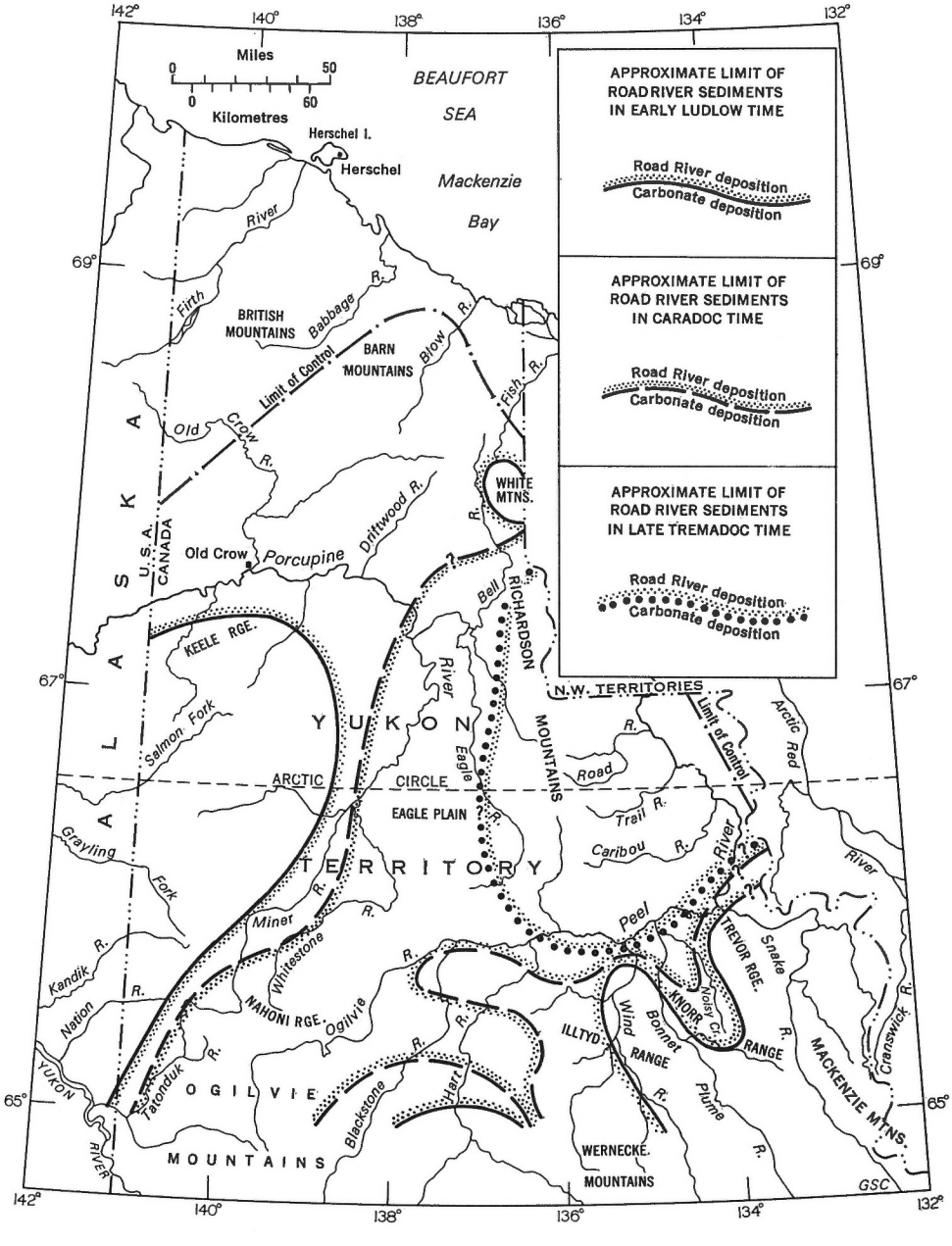

Figure 2. Probable limits of Road River sedimentation

picked at a lithologic break just above the limit of graptolites.

The positioning of the Silurian-Devonian boundary in the European sections is currently unsettled, and the uppermost limit of graptolites is being taken as the Silurian-Devonian boundary in western Canada until significant international agreement can be reached as to which of the several alternative European horizons should be chosen. The Royal Creek and Prongs Creek Sections have good outcrops of fossiliferous Upper Silurian and Lower Devonian rocks, with interbedded graptolitic and brachiopod-coral faunas, and thus may allow correlation between North American shelly faunas and a standard European sequence.

The contact between the two members of the Road River Formation is diachronous, for Jackson and Lenz reported the same Tremadoc graptolite zones from the upper part of the lower member on Tetlit Creek and the lower part of the upper member in the Peel River canyons.

The lower member consists of thinly to medium-bedded, dark grey, aphanitic to very finely crystalline limestones and argillaceous limestones. Graptolites and inarticulate brachiopods are the only common fossils but trilobites do occur in rare thin shell-fragmental limestones.

The common constituents of the upper member are dark grey limy shales and thinly bedded argillaceous limestones, greyish black shales (both limy and non-limy), thinly bedded black and greyish black cherts and argillaceous cherts, grey, very finely crystalline limestones and rare dolomites, and limestone breccias and calcarenites. Shales preponderate in the Silurian part of the unit but the Ordovician part is a mixture of very variable proportions of shales, cherts, limestones, breccias, and calcarenites.

The breccias and calcarenites probably represent turbidity current deposits and are particularly common in the Ordovician part of the Road River Formation in the Canyon Creek Section. Thicknesses range from 1/4 inch to 25 feet. The bases of the beds are abrupt, with contortion locally present in the shales and cherts beneath some of the thicker beds. Erosion surfaces are not uncommon, both beneath beds and within the thicker beds, particularly those that are composite, being formed of several successive similar deposits. The sharpstones are angular to subangular and rarely subround. Sorting is extremely poor. Vertical size grading is almost invariably present; sharpstones in the soles of some of the thicker beds are coarse boulders to fine sand, and grade upwards into fine pebbles and sand. Thin beds show parallel size grading in finer sizes. Light grey limestones are the commonest sharpstones, cherts are fairly

common, and rare pelletoid limestones can be recognized. The matrix commonly consists of a heterogeneous mixture of the finer sizes of sharpstones together with some argillaceous limestone and shaly material. Cross-lamination is rarely present in the upper parts of the beds. Most upper contacts are abrupt but a few beds grade upward into shales or cherts.

The thinner beds (1/2 inch to 3 inches thick) are far more common than the more spectacular thick units. The Canyon Creek Section demonstrates that some of these thin beds are actually lenses or wedges, thinning laterally from several inches to zero within a few score feet. Probably the thick beds show similar thinning. These turbidity-current deposits are most common in the Ordovician rocks of the southern Richardson Mountains and the thicker deposits may be useful as mappable time-lines. The very thick breccia-conglomerate in Upper Canyon of Peel River is most probably the same deposit as Unit 4 (19 feet thick) of the Canyon Creek Section, some 20 miles northwest. A possible source area for the turbidity-current material would be the northern margin of the Illtyd Range carbonate bank just south of Peel River and north of Mount Deception. Similar thin beds of breccia and calcarenite are also present in the Silurian rocks of Richardson Mountains, but are far less important than those in the Ordovician rocks. The contribution of sediment by turbidity currents has significantly thickened the Road River Formation in the Richardson Mountains and probably amounts to about 15 per cent of the Ordovician part of the formation at the Canyon Creek Section.

Graptolites are the common fossils in the upper member of the Road River Formation, and inarticulate brachiopods and rare trilobites also occur. Corals and brachiopods are present in calcarenites in the Tetlit Creek Section interpreted as turbidity current deposits. Corals, brachiopods, and trilobites occur in Silurian limestones interbedded with graptolitic shales in the Prongs Creek Section which is thought to lie close to the margin of Road River Formation sedimentation.

The graptolite zones established by Jackson and Lenz allow comparison with the Ordovician and Silurian sequences of Cornwallis Island, the Marathon Region, Australia, and Europe, but suggest that many of the cosmopolitan Wenlock and Ludlow faunas are not represented in the Road River Formation. The uppermost zone (that of Monograptus sp. E)[1] is widely distributed and is thought by Jackson and Lenz to be younger than any of the zones of the Cornwallis and British sequences (1962, p. 37).

The lower member of the Road River Formation seems to be restricted to Richardson Mountains, but the upper member was deposited over much of northern Yukon Territory, progressively

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[1] Monograptus yukonensis, see footnote under Faunal Lists.

encroaching upon the carbonate banks during Ordovician and Silurian time (Figure 2). The Vunta Formation and the carbonates of Keele and Illtyd Ranges were the only banks remaining in existence by Late Silurian time, with graptolitic facies occupying the rest of the northern Yukon for which evidence is available. Few outcrops of Road River Formation are present north of lat. 67°, but small inliers near White Mountains, within Barn Mountains, and on Porcupine River (both near Driftwood River and at Old Rampart), all suggest widespread distribution.

Carbonate sedimentation may have continued in the northwest Mackenzie Mountains but Upper Silurian rocks have not been recognized, and similarly Silurian rocks are lacking in the extreme western Ogilvie Mountains where Devonian rocks overlie Ordovician beds of the Road River Formation (Section 15). Upper Silurian and Silurian rocks were probably deposited, and may have been of Road River facies, but were removed by later erosion before deposition of Devonian rocks in these areas.

Carbonate Units

Thick successions of dolomites and limestones are present in Ogilvie, Wernecke, and White Mountains, in Keele and Illtyd Ranges, and in the small part of Mackenzie Mountains that lies in the project area. These outcrops have only been briefly studied and, with the exception of the Vunta Formation, the units are not formally named in this report. Most of the rocks are now dolomites, and fossils are so rare that dating is commonly coarse. All these rocks were placed in the unrefined map-unit 5 of the Geological Survey's Map 10-1963.

Illtyd Range

The main mass of Illtyd Range consists of a thick Ordovician and Silurian sequence of resistant, thickly bedded and massive, lime-mudstones, pelletoid lime-mudstones, and rarer conglomeratic mudlump-lime-mudstones, organic-fragmental lime-mudstones, and finely crystalline limestones. Such rock types suggest a fairly shallow bank of carbonate deposition. The northern and western margins of the bank can be approximately determined and seem rather abrupt. In Silurian time, the northern margin lay between the north end of Mount Deception and Peel River, and the western margin lay between Wind River and the Prongs Creek Section. Sediments thought to be deposited by turbidity currents are found within the adjacent outcrops of the Road River Formation, the lateral and temporal equivalent of the Illtyd Range carbonate bank. Conglomeratic rocks in

the Canyon Creek Section and in the upper canyon of Peel River carry a few pebbles of pelletoid limestones very like those of Illtyd Range.

No complete section is exposed in Illtyd Range but the total thickness of rock is thought to approach 5,000 feet. A distinctive member is truly massive, almost completely lacking any trace of bedding, and weathering into steep pinnacles, cones, and turrets (unit 3, 677 feet thick, Section 5). Faunas from the Illtyd Range carbonates indicate the presence of Lower or Middle Ordovician, Lower Silurian, probably Middle Silurian, and Upper Silurian rocks, and very probably the bank persisted throughout Ordovician and Silurian time.

Ogilvie and Wernecke Mountains

Thick lower Palaeozoic carbonates are widely distributed in the area mapped by Green and Roddick (1962) south of lat. 65°. Three map-units were recognized, the lower two (map-units 6 and 7) with Upper Cambrian, and Middle or Upper Cambrian fossils, and the uppermost (map-unit 8) with various Lower Ordovician to Upper Silurian faunas. Unit 8 is about 4,700 feet thick west of Wind River, and near this locality Green and Roddick suggest a disconformity between units 7 and 8.

Resistant grey dolomites (map-unit 5) in the Ogilvie and Wernecke Mountains of the present project area are thought to be predominantly equivalent to unit 8 of Green and Roddick, but may locally include parts of their units 6 and 7. No complete section was studied, but 2,225 feet of beds was measured beneath the Road River Formation near Blackstone River (Section 10) and the unit probably totals 3,000-4,000 feet at its thickest development near Hart and Wind Rivers. Most of the rocks are thickly bedded, finely to coarsely crystalline, somewhat siliceous dolomites, but externally similar limestones are locally present. Aphanitic limestones at Prongs Creek, and pelletoid and aphanitic limestones at the head of Tatonduk River suggest some similarity in lithology and depositional environment to the rocks of Illtyd Range, but dolomitization has masked the evidence for most outcrops in Ogilvie and Wernecke Mountains.

Fossils are rare except for an Upper Ordovician coral and brachiopod fauna found near Prongs Creek, Clear Creek, Pat Lake, and the northern part of Blackstone River. Faunas indicate Lower Ordovician, probably Middle Ordovician, and Upper Ordovician rocks, and the lower part of the unit may extend into the Upper Cambrian. Carbonate sedimentation was probably already established throughout Ogilvie and Wernecke Mountains at the onset of Ordovician time and later gave way to deposition of the graptolitic sediments of the Road

River Formation with deepening of the lower Palaeozoic sea. Submergence of the carbonate bank was not contemporaneous throughout Ogilvie and Wernecke Mountains, and the basal Road River is Arenig at Blackstone River, Llandeilo or Caradoc at the head of Tatonduk River, Caradoc at the head of Monster River, and Llandovery at Prongs Creek (Figure 2 and Sections 11, 15, 14, and 7). North of Pat Lake a thin carbonate tongue within the Road River Formation indicates local shallowing and temporary re-establishment of carbonate sedimentation during part of Ordovician time (Section 9). Green and Roddick collected Upper Silurian fossils from carbonates near Hart River just south of lat. 65° N and thus southern parts of the carbonate bank survived through Silurian time.

Just south of Tatonduk River and west of long. 141°, Mertie (1933, pp. 402-404, Shade Creek locality) reported siliceous shales and thinly bedded cherts that represent the Road River Formation and overlie a carbonate unit from within which Upper Cambrian fossils were collected. The list of graptolites identified by Ruedemann (Mertie, 1933, p. 404) suggests Caradoc age, and thus rocks at the locality resemble outcrops at the head of Tatonduk River (Section 15). Rocks described by Mertie and by Cairnes (1914) north of Tatonduk River lack this Road River incursion and are considered with the carbonates of Keele Range. A major thrust is exposed near Tatonduk River (see Norris, Price, and Mountjoy, 1963) and has brought into close proximity Ordovician rocks that are stratigraphically different.

Keele Range

Outcrops are generally poor in the talus-covered hills of Keele Range and the present stratigraphic reconnaissance was unable to establish much more than the presence of Ordovician and Silurian limestones and dolomites. Fossils collected record Lower and Middle Ordovician, Lower or Middle Silurian, and Upper Silurian faunas, and faunal lists given by Cairnes suggest Upper Ordovician and Upper Silurian (1914, pp. 67-69, lots 6148, 6n48, 11k46, 11n44). Keele Range was the site of carbonate sedimentation through probably most of Ordovician and Silurian time. The area of deposition probably extended southwards to Tatonduk River and southeast to beyond Mount Burgess where Devonian rocks rest directly on Ordovician strata. Carbonates of Ordovician and possibly earlier age measure more than 3,564 feet near Mount Burgess (Section 16). Westward, Kindle reported a thick sequence of Ordovician and Silurian dolomites and limestones on Porcupine River some 25 miles west of long. 141°, beneath thin, low Upper Silurian, graptolitic shales that directly underlie the Devonian Salmontrout Limestone (Kindle, 1908, pp. 322-327; Ruedemann, 1947, p. 494). Southward, faunal lists for carbonate

rocks near Hard Luck Creek, on Squaw Mountain, and on Jones Ridge, all just north of Tatonduk River and near the International Boundary, suggest the presence of Lower and Upper Ordovician, and Silurian rocks (Cairnes, 1914, pp. 65-75; Mertie, 1933, pp. 403, 406; Kobayashi, 1936, p. 157). Cambrian carbonates are also present, and both Cairnes and Mertie were unable to distinguish rocks of the three systems by lithologic characters.

White Mountains (Vunta Formation)

The White Mountains are a faulted dome of light-grey-weathering rocks forming an inlier within the upper Palaeozoic outcrops of the northern Richardson Mountains. The few other such inliers in the northern Richardsons, in Barn Mountains, and along Porcupine River, all reveal small segments of the Road River Formation and thus the White Mountains Ordovician and Silurian carbonate bank is thought to be of restricted lateral extent. Only one good stratigraphic section is available for the lower part of the dome and this is used as the type section for a new stratigraphic unit, the Vunta Formation.

The term "Vunta Formation" is proposed for about 2,853 feet of pelletoid, aphanitic, and finely crystalline limestones that outcrop along Vunta Creek and on both sides of Fish Creek (Section 23, units 5-8). These rocks are medium bedded to massive and form resistant light grey outcrops. The formation overlies a unit of dolomites and dolomite breccias with paraconformable or gradational contact, and its upper boundary is picked at the base of a covered interval beneath recessive, thinly bedded Upper Silurian limestones that are structurally conformable. Several faults are present within the type section; their throws are unknown and thus the thickness of the formation cannot be precisely measured. Fossils from the Vunta Formation range from probably late Lower Ordovician to probably Upper Silurian, but the lower beds have yielded no diagnostic fossils and could be either Lower Ordovician or Cambrian. No fossils have been found in the subjacent dolomite breccia unit, which is assumed to be Cambrian in age on the basis of its stratigraphic position about 1,300 feet below the lowest dated horizon within the Vunta. Outcrops of the Vunta Formation are restricted to the White Mountains but the unit may extend to the west and southwest in the subsurface.

At the type section, most of the Vunta Formation consists of a monotonous sequence of resistant, thickly bedded, pelletoid limestones (Section 23, unit 5, 2,220 feet thick). The pellets are composed of aphanitic lime mud, and rare layers of lime mud and sub-round pebbles of pelletoid limestone are developed within beds of pelletoid rock. Clear crystalline calcite is present as matrix and vug

fillings in most rocks. Floating dolomite rhombs form minor constituents of many beds and a very few beds have been completely dolomitized. Lime muds preponderate in the uppermost 200 feet of unit 5 and these also carry clear crystalline calcite as vug fillings. Very sparse shell-fragmental material is present in these uppermost beds. The top 633 feet of the type section consist of similar aphanitic lime muds together with very finely to finely crystalline limestones (Section 23, units 6-8). Pelletoid rocks are unimportant. Shell debris is common in many beds and dolomite rhombs amount to 5-10 per cent of some beds. This upper part of the Vunta Formation is moderately fossiliferous in contrast to the almost barren lower, pelletoid, rocks.

The Vunta Formation is overlain by 2,431 feet of recessive dolomites and limestones that themselves underlie Middle Devonian rocks (Section 23, units 9-12). The main mass of these rocks is barren of fossils but Devonian fossils are present in the upper beds, and the lower part (units 9-10, 619 feet thick) carries Upper Silurian brachiopods.

The lowest beds of the Vunta Formation are either Lower Ordovician or Cambrian, but certainly carbonate deposition was already established in White Mountains in pre-Vunta time (Section 23, units 1-4, assumed Cambrian). The lithologies of the Vunta Formation suggest deposition on a fairly shallow bank, and carbonate sediments that reflect a somewhat different environment outcrop above the Vunta. Thus, during most of Ordovician and Silurian time, the region of graptolitic sedimentation of the central and southern Richardson Mountains was limited to the north and to the south by two shallow carbonate banks, those of White Mountains and the Illtyd Range.

Northwest Mackenzie Mountains

The carbonate rocks exposed in Canyon Ranges of the northwest Mackenzie Mountains have little in common with the limestone succession of Illtyd Range, even allowing for the effects of dolomitization. The sequence is thinner, can be more easily divided into discrete lithological units, contains a few biostromal Silurian beds, and compares more readily with rocks outcropping farther east in Mackenzie Mountains.

McKinnon has described the stratigraphy along Arctic Red River in the District of Mackenzie, and the upper part of his Ordovician and Silurian section is similar to rocks of Canyon Ranges and near Cranswick River (McKinnon, 1944, pp. 5-7; and in Hume, 1954, p. 18). The disconformity between units 11 and 12 of the Canyon Range Section (Section 2) may represent the same break as that within the rocks called "Ronning" on Arctic Red River. Beneath this break,

little comparison is possible between Canyon Ranges and the thinner units reported from Arctic Red River. The Upper Ordovician and Silurian resistant dolomites of the Canyon Ranges Section (units 12-16) total about 767 feet and probably correspond to McKinnon's upper Ronning unit (more than 700 feet thick). More than 500 feet of light grey carbonates were reported to overlie this Ronning unit on Arctic Red River and were termed "Bear Rock (?)". These rocks may be laterally equivalent to parts of units 17-22 (at least 925 feet thick) of the Canyon Ranges Section, and to units 15-18 and higher beds of the Cranswick River Headwaters Section (Section 1).

OIL AND GAS PROSPECTS

The limestones prevalent in White Mountains and Illtyd Range are tight and therefore have little potential as reservoir rocks. Vugs and small fractures that are present are filled with clear crystalline calcite. Dolomitized carbonates elsewhere in northern Yukon locally show significant amounts of vuggy porosity. Such porosity, combined with intergranular porosity in rocks in which cementation is incomplete, and with fracturing that is present in some beds, may produce good reservoirs for oil and gas.

Vuggy porosity is locally developed in Ordovician dolomites of the Ogilvie Mountains carbonate bank, at Royal Creek, Blackstone River, Ogilvie River, and the headwaters of Monster River (Sections 6, 11, 12, 14). The Ordovician carbonates of the Mount Burgess Section, southeast of the Keele Range, include two thick intervals with significant amounts of fine vuggy porosity (units 6 and 13, Section 16).

These carbonate rocks extend into the subsurface of Eagle Plain where they are overlain by the shales, argillaceous limestones, cherts, and limestones of the Road River Formation and may prove to be important reservoirs. In the same directions (northwards from Ogilvie Range and eastwards from the southern Keele Range) the carbonate banks give way to contemporaneous deposits of graptolitic facies (Figure 2). Thus the exact position of this belt of facies change is of great importance for it controls the distribution of potential Ordovician reservoir rocks beneath Eagle Plain. The present data suggest that these rocks are present in the southwestern part of Eagle Plain, but are lacking in the north, east, and southeast.

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APPENDIX I. STRATIGRAPHIC SECTIONS

Section 1. CRANSWICK RIVER HEADWATERS SECTION

The section lies within the District of Mackenzie, in the Backbone Ranges of Mackenzie Mountains. Measurement was by A. W. Norris in late June, immediately east of a small gully near 65°08'N, 132°16'W.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Devonian rocks		
18	Dolomite, finely crystalline, light greenish grey, very light grey, weathers pale orange, some beds granular, medium to thickly bedded.	27	808
17	Limestone, argillaceous and silty, brownish grey, dark greenish grey, weathers pale orange, resistant, thickly bedded, nodular in lower beds. Greenish grey shales common in lower part of unit and as interbeds in upper part.	29	781
16	Covered interval, float of greenish grey and brownish grey limestone, some with silt lenses, and light grey, pale orange-weathering dolomite.	86	752
15	Dolomite, finely crystalline, light grey, weathers pale orange, pale orange-brown, light grey, moderately resistant, some beds granular, thickly to medium bedded; silty laminae in some beds. Covered intervals at 659-662 and 616-631. Contact with unit 14 a regional unconformity.	50	666
	Ordovician and Silurian rocks		
14	Dolomite, finely crystalline, very light grey, weathers very light grey, granular, recessive, thinly bedded.	49	616

Unit	Lithology	Thickness (feet) Unit	Total from Base
13	Dolomite, slightly limy, finely crystalline, light brown, weathers light brownish grey, bedding thick to massive.	31	567
12	Dolomite, some slightly ferruginous, some argillaceous, aphanitic, brownish grey, weathers brownish grey, grey, thinly to thickly bedded; some beds include silty laminae.	58	536
11	Dolomite, some slightly limy, aphanitic to finely crystalline, brown, brownish grey, pale brown, weathers brownish grey, grey, pale brown, pale yellowish brown, somewhat recessive, medium bedded to massive. Ostracods, brachiopods (GSC loc. 54446, 439-445).	59	478
10	Dolomite, some slightly limy, aphanitic, pale brown, weathers pale brown, pale yellowish brown, thinly bedded to massive.	71	419
9	Limestone, aphanitic to finely crystalline, pale brown, brownish grey, brown, weathers pale yellowish brown, light grey, some beds resistant, bedding thick; with aphanitic dolomite, pale brown, weathers pale brown, pale yellowish brown, recessive, medium bedded.	66	348
8	Dolomite, aphanitic, pale brown, weathers yellowish brown, moderately resistant, thickly bedded.	42	282
7	Dolomite, finely to medium crystalline, brown, brownish grey, pale brown, weathers light creamy brown, pale brownish grey; lower beds silty and sandy.	49	240

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
6	Limy dolomite and dolomitic limestone, grey, light grey, weathers grey, light grey, bedding thick to massive.	56	191
5	Covered interval.	7	135
4	Limestone, aphanitic, dark grey, black, weathers grey, dark grey; recessive, thinly bedded.	14	128
3	Limy dolomite, light grey, grey, brownish grey, brown, weathers light grey, grey, pale yellowish brown, thinly to medium bedded; some beds fractured; with dark grey limestones at 99-105.	51	114
2	Dolomitic limestone, aphanitic, pale grey, weathers light grey, resistant, massive.	14	63
1	Dolomite, aphanitic, light grey, weathers light grey, creamy brown, pale orange, with orange stains; some beds resistant, some recessive, thickly bedded to massive; with silty laminae in lowest beds.	49	49

Section 2. CANYON RANGES SECTION

The northern Canyon Ranges abruptly face lower hills along an eastwest-trending fault zone. The section is just south of the front of the ranges and was measured by staff and by tape across a shallow anticline and associated syncline (65°28-30'N, 132°57'-133°03' W). The section begins at the base of a quartzite outcrop. Exposures on a neighbouring ridge closer to the core of the anticline show that this quartzite unit is underlain by siliceous shales that weather reddish brown and greyish red-purple. The top of the section is in the axial region of the syncline, at the peak of a ridge trending west from a 4,872-foot triangulation point. Much of the section is hidden by felsenmeer and some parts were covered by snow when measured in late June.

A disconformity is present beneath 767 feet of Upper Ordovician and Silurian dolomites that underlie a sequence of yellowish grey and yellowish orange-weathering dolomites that may be Devonian.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian or Silurian rocks		
22	Siliceous dolomite, some limy, very finely crystalline to aphanitic, grey and light olive-grey, weathers light grey and grey, bedding 3 to 12 inches. Barren. Contact with unit 21 gradational.	126	3,362
21	Siliceous dolomite, some limy, aphanitic to very finely crystalline, light grey, grey, light olive-grey, light greenish grey, weathers yellowish grey, yellowish orange, light grey, recessive, bedding 6 inches to 3 feet. Barren.	314	3,236
20	Covered interval with rare outcrops of siliceous dolomite, aphanitic, grey, weathers yellowish grey, yellowish orange, light grey.	195	2,922

Unit	Lithology	Thickness (feet) Unit	Total from Base
19	Siliceous dolomite, very finely crystalline, light bluish grey, weathers grey, relatively resistant, bedding 1/4 foot to 4 feet; with interbeds of yellowish-grey-weathering dolomite in upper, less resistant part. Barren.	19	2,727
18	**Dolomite,** mostly siliceous, very finely crystalline to aphanitic, grey, light grey, weathers yellowish grey, light yellowish grey, light grey, grey; recessive, bedding 2 to 24 inches; some beds laminated, some mottled grey on light grey, others mottled light grey on yellowish grey, some alternations of light grey and yellowish grey-weathering beds; rare irregular chert nodules. Unit poorly exposed, about 60% covered. Gastropods at 2,644-2,665 (GSC loc. 53153, 2,644).	143	2,708
17	Covered interval with dolomite float. Boundary between units 16 and 17 picked at change of float-weathering colour from dominantly yellowish grey to dominantly light grey.	128	2,565
	Silurian and Upper Ordovician rocks		
16	Dolomite, mostly siliceous, very finely to medium crystalline, light grey, grey, yellowish grey, weathers light grey, yellowish grey, bedding 3 inches to 8 feet, commonly indistinct; with calcite filled vugs common in lower beds; irregular chert nodules at a few horizons; very minor brownish grey mottled dolomite. At 2,390-2,395, dark brownish grey biostromal beds with abundant stromatoporoids in growth positions; at 2,335, crest of ridge; at 2,270,		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	1% pin-point porosity. Covered interval at 2,432-2,437. Stromatoporoids, corals (GSC locs. 53152, 2,391-2,393; 53151, 2,354-2,356; 53150, 2,279-2,283).	301	2,437
15	Dolomite, mostly siliceous, very finely to finely crystalline, grey, dark grey, bluish grey, weathers grey, light grey, yellowish grey (middle part of unit appears banded in light grey and yellowish grey when well weathered), bedding 3 inches to 3 feet; some beds laminated, others weather blocky; rare stylolites and very rare dark grey irregular chert nodules and thin chert beds. Covered interval at 1,916-1,920. Corals, stromatoporoids, brachiopods, cephalopods (GSC loc. 53149, 1,998-2,002).	231	2,136
14	Dolomite, mostly siliceous, finely to medium crystalline, bluish grey, weathers grey and dull grey, moderately resistant, bedding 3 inches to 3 feet; with about 2% irregular chert nodules weathering greyish yellow and light grey and amounting to 8% at 1,865-1,880. Poorly preserved corals.	101	1,905
13	Covered interval.	29	1,804
12	Dolomite, mostly siliceous, finely to coarsely crystalline, bluish grey, grey, brownish grey, weathers grey, dull grey, bluish grey, light grey, with lichen staining; resistant, bedding 1 foot to 6 feet, indistinct; about 2% irregular chert nodules and rare lenticular chert layers that weather		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	greyish black, yellowish grey, greyish yellow, off-white; but at 1,691-1,706, unit lacks chert. Corals, brachiopods, stromatoporoids in lowest and uppermost beds (GSC locs. 53157, 1,769-1,775; 53148, 1,676-1,678). Lower boundary disconformable with erosion surface cut 15 inches into brown-stained top beds of unit 11.	105	1,775
	Ordovician rocks		
11	Dolomite, mostly siliceous, very finely to coarsely crystalline, grey, dark grey, light brownish grey, bluish grey, weathers light grey, grey, yellowish grey, bedding 1 foot to 10 feet in upper part, 3 inches to 4 feet in lower part, rare beds laminated; dolomite stringers and veins common; rare compound veins, inner core calcite, outer lining dolomite; irregular silicification layers in lower beds. At 1,446, 3% fine vuggy porosity; at 1,318, 1% greyish black chert nodules; at 1304-1314, zone with abundant coarse dolomite stringers and veins, and brecciated beds. Barren.	450	1,670
10	Limestone, aphanitic to very finely crystalline, dark grey, dark bluish grey, grey, weathers grey, light grey, yellowish grey; relatively resistant, bedding 2 feet to massive, many beds weather platy and into shards; some beds coarsely laminated with discontinuous light-grey-weathering bands on grey background; some beds argillaceous limestone; rare beds shaly limestone. Barren, but trilobite pygidium in float.	224	1,220

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
9	Covered interval.	61	996
8	Limestone, aphanitic to very finely crystalline, dark grey, dark bluish grey, grey, weathers grey, bluish grey, light grey, yellowish grey; recessive, bedding 1 inch to 24 inches; some beds laminated, fresh in grey and dark grey, weathered in light grey and yellowish grey; some beds platy, some shaly limestone; rare greyish black argillite; 6-inch bioclastic limestone bed at 932. Unit poorly exposed, covered interval at 826-881. Trilobite fragments (GSC locs. 53156, 932 0"-3"; 53155, 810 0"-2").	127	935
7	Covered interval	203	808
	Cambrian rocks		
6	Siliceous dolomite, very finely to finely crystalline, bluish grey, grey, weathers yellowish grey, grey, pale greyish orange; recessive, bedding 2 to 24 inches, some beds platy; many beds laminated, fresh in grey and bluish grey, weathered in pale greyish orange and yellowish grey, some light yellowish orange and yellowish grey shaly partings, particularly at 500-502; rare irregular siliceous laminae within beds. Unit poorly exposed. Rare brachiopods, echinoderm fragments (GSC loc. 53154, 472-473).	165	605

Unit	Lithology	Thickness (feet) Unit	Total from Base
5	Siliceous dolomite, very finely crystalline to aphanitic, grey, bluish grey, light grey, weathers grey, yellowish grey, bluish grey, with light buff stains, bedding 3 inches to 3 feet, some beds platy, some beds laminated; with silica and dolomite as vug fillings, veins and stringers. Dolomites, finely to coarsely crystalline, dark bluish grey, grey, weather grey, bluish grey, light grey, yellowish grey, bedding 6 inches to 2 feet; some beds with dolomite stringers. Covered intervals at 348-368 and 185-194. Barren.	310	440
4	Siliceous dolomite, finely to coarsely crystalline, light grey, whitish grey, weathers bluish grey, grey, with buff stains, bedding 1 foot to 2 feet; greenish grey dolomitic argillites as lenticular interbeds; with geoids, veins, and stringers, filled with coarse silica, dolomite, and calcite. Barren.	31	130
3	Covered interval.	19	99
2	Quartzite, most slightly dolomitic, finely to medium crystalline, light grey, light brown, weathers light brown, light yellowish brown, less resistant than unit 1, bedding 6 to 18 inches; sand grains about 80% quartz, subangular to subround. Barren. Contact gradational with unit 1.	30	80

Unit	Lithology	Thickness (feet) Unit	Total from Base
1	Quartzite, very finely to medium crystalline, white, greyish white, greenish white, orange-red, weathers off-white, with lichen stains; resistant, bedding 6 inches to 10 feet, rare beds laminated; sand grains about 98% quartz, subround to round, sorting moderate. Barren.	50	50

Section 3. TREVOR RANGE SECTION

Silurian carbonates form the core of a dome-like structure near the northern end of the Trevor Range. The section is on the east flank of the structure near 65°51'N, 134°14'W. Measurement was by A. W. Norris in early June. The top of unit 19 probably lies within 100 feet stratigraphically of Devonian rocks.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Silurian rocks		
19	Dolomite, finely to medium crystalline, light grey, pale brown, weathers light grey, pale brownish grey, many beds resistant, bedding thick to massive; irregular fissures and pods of calcite and dolomite; local brecciated beds at 846-858; coarsely crystalline, light grey and black mottled dolomites at 1,026-1,055. Covered intervals at 972-980, 958-966, 917-941 and 898-907. Rare, poorly preserved stromatoporoids (GSC loc. 50574, 941-950).	209	1,055
18	Dolomite, finely to medium crystalline, dark grey, brownish grey, weathers dark grey, granular, some beds vuggy, many beds resistant, bedding medium to massive. Covered intervals at 815-825, 759-788 and 748-751.	111	846
17	Covered interval, with outcrops at 694-701, dolomite, finely crystalline, brownish grey, weathers dark grey, granular, thinly and irregularly bedded; irregular masses of coarse dolomite.	51	735
16	Dolomite, finely crystalline, grey, weathers light grey, very resistant, thinly bedded; interbeds of dark grey and black chert.	5	684

Unit	Lithology	Thickness (feet) Unit	Total from Base
15	Covered interval.	27	679
14	Limestone, light grey, weathers grey, resistant, medium bedded.	7	652
13	Dolomite, medium crystalline, light grey, weathers light grey, resistant, massive.	13	645
12	Covered interval.	14	632
11	Dolomite, some siliceous, finely to very finely crystalline, dark grey, weathers dark grey, thinly bedded; black chert nodules; black chert interbeds at 606-618. Covered intervals at 558-568 and 545-552. Rare small atrypid brachiopods.	76	618
10	Covered interval	18	542
9	Dolomite, finely crystalline, dark grey, weathers dark grey, some beds resistant others somewhat recessive, medium bedded to massive; nodules and thin lenses of black and dark grey chert. Covered interval at 431-451. Corals, brachiopods (GSC locs. 50572, 503-517; 50573, 482-493; 50569, 463-482; 50576, 445-451 loose; 50571, 421-431; 50570, 420).	114	524
8	Dolomite, finely crystalline, dark grey, weathers dark grey, resistant, a single thick bed. Corals (GSC loc. 50568).	6	410

Unit	Lithology	Thickness (feet) Unit	Total from Base
7	Dolomite, finely crystalline, dark grey, weathers dark grey, recessive, thinly to medium bedded. Corals, echinoderm fragments (GSC locs. 54985, 393-404; 54983, 370-393).	34	404
6	Dolomite, finely crystalline, dark grey, weathers dark grey; recessive but a few resistant beds; thinly to medium bedded; irregular nodules, lenses, and interbeds of black chert that weather dark grey; fissures of white calcite and dolomite. Covered interval at 301-314.	143	370
5	Dolomite breccia and dolomite, finely crystalline, dark grey, weathers dark grey, massive; black chert lenses; sharpstones of dark grey dolomite and black chert, matrix finely to coarsely crystalline dolomite.	32	227
4	Dolomite, finely crystalline, dark grey, weathers dark grey, thinly to medium bedded; numerous lenses and irregular nodules of black chert; irregular fissures of coarsely crystalline dolomite.	27	195
3	Dolomite, finely crystalline, dark grey, weathers dark grey, thickly bedded to massive; with thin lenses and irregular nodules of black chert; float of dolomite breccia at 134. Covered interval 133-154.	44	168
2	Dolomite, finely crystalline, dark grey, weathers dark grey, thinly to medium bedded; with thin lenses and nodules of black chert. Covered intervals at 110-124, 66-81 and 33-56. Corals, brachiopods (GSC loc. 50566, 15-33).	109	124

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
1	Dolomite, finely crystalline, grey, weathers light grey, resistant, massive. Corals, brachiopods (GSC loc. 50565).	15	15

Section 4. KNORR RANGE SECTION

The section is in the southeast flank of Knorr Range at approximately 65°23'N, 134°11'W. A north-dipping succession is poorly exposed on the north side of a fault with Devonian rocks overlying the Road River Formation and a thin sliver of an Ordovician carbonate unit.

Measurement was by A. W. Norris in early June.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
17	Shale, limy, black, weathers dark grey, black, pale orange; minor argillaceous limestone, aphanitic to medium crystalline, black, weathers brownish grey, grey, orange, bedding thick to medium, a few beds are silty and conglomeratic with pebbles of black chert. Tentaculites, Styliolina, brachiopods, corals (GSC locs. 50357, 1892-1922; 50360, 1854-1859; 50355, 1844; 50362, 1831; 50354, 1819; 50629, 1725-1729; 50359, 1634-1638; 50356, 1613; all loose).	448	2,007
	Devonian rocks and Road River Formation		
16	Covered interval, with float of limy shale and limestone; outcrops at 809-810 and 805-806, limestone, silty and bioclastic, aphanitic to coarsely crystalline, black, weathers dark grey, pale orange, medium bedded. Tentaculites, Styliolina (GSC loc. 50586, loose from upper part of unit).	813	1,559

Unit	Lithology	Thickness (feet) Unit	Total from Base
15	Limestone, argillaceous and silty, finely crystalline, black, dark grey, brown, weathers grey, pale orange, thinly to medium bedded, some beds weather platy.	43	746
14	Shale, limy, black, weather pale brown, pale orange, recessive, platy, very fissile. Covered intervals at 696-703 and 686-693. Styliolina, corals (GSC loc. 50583, 693-696).	24	703
13	Covered interval, float of argillaceous limestone, black, platy, weathers pale orange, and of slightly argillaceous limestone, finely crystalline, black, weathers grey. Styliolina (GSC loc. 50585, 679-689, loose).	28	679
12	Limestone, argillaceous and silty, aphanitic, black, weathers dark grey, grey, pale brown, pale orange; some beds laminated on weathered surface, bedding medium, some beds platy and fissile. Covered interval at 633-649. Styliolina, corals, brachiopods (GSC locs. 50584, 649, loose; 50580, 637, loose; 50582, 626, loose; 50575, 621-622).	32	651
11	Limestone, fetid, black, weathers grey, resistant, massive.	8	619
10	Covered interval, float of limy shale and argillaceous limestone, weathers grey, dark grey, pale orange. Styliolina, brachiopods, corals (GSC locs. 50456, 575-579, loose; 50458, 463-467, loose).	149	611

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
9	Shale, limy, black, weathers pale orange. Covered intervals at 455-457 and 445-451). Styliolina, brachiopods.	19	462
8	Limestone, argillaceous, some slightly silty, black, weathers pale orange, brown, dark grey, orange-brown, platy, fissile, thinly bedded; with limestone, aphanitic, black, weathers dark grey, grey, medium bedded; rare recessive black shale; rare lenses and nodules of black chert in the limestone. Covered intervals at 436-438, 337-339, 326-335 and 295-306. Styliolina, brachiopods, corals, stromatoporoids, and monograptid graptolites (below 390) (GSC locs. 50450, 395-412; 50448, 390-395; 50439, 372-390; 50454, 360-366; 50441, 353-360; 50440, 344-351; 50445, 337-339, loose; 50446, 306-315, loose; 50451, 284-295, loose).	159	443
7	Covered interval, float of argillaceous limestone, black, weathers pale orange, of finely crystalline limestone, dark grey, weathers dark grey, light grey, of black limy shale. Brachiopods (GSC loc. 50442, 222-226, loose; 50455, 208-218, loose).	80	284
6	Limestone, some argillaceous and silty, aphanitic, black, greyish black, weathers grey, dark grey, platy, thinly bedded. Covered interval 170-175. Corals (GSC loc. 50452, 158-170).	46	204

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Ordovician(?) rocks		
5	Covered interval, float of finely crystalline, fetid limestone, dark grey, weathers light grey, thickly bedded. Corals (GSC loc. 50453, 134-158, loose).	28	158
4	Limestone, finely to medium crystalline, light grey, weathers light grey, thickly bedded. Covered interval 89-109. Silicified corals (GSC locs. 50564, 109-130; 50444, 89-109, loose; 50449, 80-89).	50	130
3	Covered interval, float of medium crystalline limestone, weathers light grey, Silicified corals (GSC loc. 50447, 70-80, loose).	36	80
2	Limestone, finely crystalline, light grey, weathers light grey, thickly bedded. Silicified corals.	10	44
1	Covered interval, float of medium to coarsely crystalline limestone, light grey, weathers light grey. Corals (GSC loc. 50459, loose). Zero footage is close to a fault zone.	34	34

Section 5. SOUTH ILLTYD RANGE SECTION

A very thick sequence of massive light-grey-weathering limestones forms the southern part of the Illtyd Range. The best section is given by a steep creek gully that overlooks a small lake at 65°14'N, 135°11-14'W. The rocks dip west into the mountain at 10 to 20° and the back slope of the ridge is steeper than the dip so that the section ends in poor limestone outcrops on the flat top of the mountain. The section similarly lacks a satisfactory base, for the lowest beds outcrop in a gully 1/2 mile south of the main section and are lithologically similar to the rest of the mountain. Measurement was by staff, with taped covered intervals, in June with negligible snow cover.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Silurian or Devonian rocks		
12	Covered interval with here and there outcrops of limestone, pelletoid, aphanitic, and pelletoid-fragmental, light grey, light olive-grey, grey, weathers light grey, bedding 1 foot to 2 feet.	477	3,582
11	Limestone, pelletoid, grey, light grey, brownish grey, weathers light grey and yellowish grey, bedding 6 inches to 3 feet; some aphanitic limestone; some beds bear calcite-filled vugs. Rare stylolites. Covered intervals at 2,868-2,874, 2,988-3,015, 2,967-2,977 and 2,924-2,931. Top of cliffs at 2,904, higher strata less well exposed. Rare ostracods (GSC loc. 53120, 3,098).	237	3,105
10	Limestone, pelletoid, and aphanitic, grey, weathers light grey with light buff stains, resistant, bedding 4 feet to massive; rare calcite-filled small vugs; rare fragments of aphanitic limestone and fossils. Rare stylolites; very rare ostracods and brachiopods (GSC loc. 53119, 2,806).	126	2,868

Unit	Lithology	Thickness (feet) Unit	Total from Base
9	Covered interval, similar limestone occupies part of the interval along strike.	21	2,742
	Silurian rocks		
8	Limestone, aphanitic, light grey, grey, light olive-grey, weathers light grey and light bluish grey, with buff stains, resistant, bedding 1 foot to massive; very common pelletoid layers and beds, and rare bioclastic and fragmental constituents; some clear, sparry, calcite-filled vugs; shaly and platy limestones at 2,395-2,397. Covered intervals at 2,422-2,428 and 2,412-2,416. Ostracods, brachiopods, corals, gastropods (GSC locs. 53118, 2,554; 53117, 2,454; 53116, 2,412; 53115, 2,305-2,306; 53114, 2,226-2,227).	523	2,721
7	Covered interval.	16	2,198
6	Dolomitic limestone, siliceous, finely crystalline, possibly pelletoid, brownish grey, weathers yellowish grey, somewhat recessive; bedding 1 foot to 2 feet; coarse calcite-filled vugs; very rare pyrite crystals. Barren.	8	2,182
5	Covered interval.	7	2,174
4	Limestone, pelletoid, light brownish grey, light olive-grey, light grey, weathers light grey, light bluish grey, with light buff stains, resistant, bedding 3 feet to massive, mostly massive; clear, sparry, calcite-filled vugs in many beds; fragments of aphanitic limestone in some beds;		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	rare bioclastic debris in a few beds; some limestone, aphanitic to very finely crystalline, very light grey, weathers light grey, bedding massive; a bed with 25% of coarse, rounded limestone pebbles at 1,743-1,745. Corals, stromatoporoids, brachiopods, ostracods, echinoderm fragments (GSC locs. 53113, 2,077-2,081; 53112, 1,743-1,745).	518	2,167
3	Limestone, very finely to coarsely crystalline, light grey, off-white, very light grey, light brownish grey, grey, weathers light grey with light buff stains, resistant, bedding massive; outcrops form steep pinnacles and cones, orthogonal to the rarely discernible bedding; very rare pelletoid limestone, light brownish grey, weathers light grey, bedding massive; dark grey aphanitic limestone at 1577. Corals (particularly Favosites), rare brachiopods, stromatoporoids, trilobites, cephalopods (GSC locs. 53111, 1,522-1,528; 5,3110, 1,464; 54664, 1,427; 53109, 1,400-1,403; 53108, 1,327-1,342; 53107, 1,252-1,257; 53106, 1,147-1,162; 53105, 1,104-1,108). Contact with unit 2 conformable, picked at base of massive rocks.	677	1,649
	Silurian and/or earlier rocks		
2	Limestone, aphanitic, dark grey and grey, weathers light grey and light bluish grey, with light buff stains, resistant, bedding 1 foot to massive; rare lime-mudstone conglomerates and pelletoid limestones; sparry calcite-filled vugs in some beds. Gastropods,		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	corals (some not in growth positions) (GSC loc. 53104, 951-967). Contact with unit 1 apparently gradational.	105	972
1	Limestone, pelletoid, light brownish grey, light grey, light olive-grey, very light grey, weathers light grey, light bluish grey with some buff stains, resistant, bedding 2 feet to massive, commonly indistinct; rare fragments of aphanitic limestone in some beds; sparry calcite-filled vugs in a few beds. Barren.	867	867

Section 6. ROYAL CREEK SECTION

Royal Creek trims the northwest flank of Royal Mountain and exposes an excellent section of recessive Silurian and Devonian rocks in its right bank at 65°02-04'N, 135°08-10'W. The base of the section is placed above a fault within an extensive outcrop of massive carbonates, the top is the highest bed exposed along a stretch of bank where the creek flows almost parallel with the strike of the rocks. Dips are uniform, 30°-50° to the southwest, measurement was by staff, with tape for covered intervals, in early June when snow was gone from the outcrops but high water in the creek precluded access to some rocks. The section is unique in its good exposure of the very recessive, cephalopod-rich shale, Unit 6, 643 feet thick, at the base of the Devonian.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Devonian rocks		
8	Shale, non-limy, grey-black and dark grey, weathers dark grey, grey-black, and metallic dark blue-grey, recessive, fissility medium to good. Shale, cherty, dull grey-black, weathers dull grey-black, metallic dark blue-grey, and rusty-brown, recessive, poorly fissile. Chert, impure, grey-black, weathers dull grey-black, bedding 1/2 inch to 6 inches. Unit more than 75 per cent covered, contact with unit 7 covered. Barren.	916	4,625
7	Shale, 60 to 70%, limy, dark grey, grey, and dark brownish grey, weathers dark grey, brownish grey, and grey-black, recessive, fissile; limestone concretions. Limestone, 5 to 25% of lower half of unit, 30 to 90% of upper half, some siliceous, some slightly argillaceous, very finely crystalline, dark grey, grey, and dark bluish grey, weathers grey, yellowish grey, light grey, and greyish orange, bedding 1 inch to 18 inches;		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	some beds graded with conglomeratic basal layers of ill-sorted debris, preponderantly crinoidal, and rarely similar lenses within the beds; bases of such graded beds commonly irregular and undulatory with some contortion of subjacent shale and inclusion of discrete, nodular lenses of limestone within the shale; upper surfaces commonly abrupt, plane, with the uppermost layers of some beds finely laminated and rarely cross laminated. Paper-shale, 5 to 20% of lower half of unit, grey-black, weathers grey-black, very fissile. Chert, 5 to 10% of unit, impure, grey-black, weathers grey-black, bedding 1/2 inch to 4 inches, and as layers within limestone beds. Rare limestone conglomerate and breccia, with ill-sorted pebbles and cobbles of limestone and bioclastic material in basal parts of beds, grading upwards into very finely crystalline limestone, bedding 3 inches to 3 feet; upper and lower surfaces similar to those of limestones. Covered interval at 3,094-3,108. Straight cephalopods, Tentaculites(?), and rare coiled cephalopods in the shales (GSC locs. 53103, 3,547; 53099, 2,943-2,949; 53098, 2,924-2,929; 53097, 2,856-2,866; 53096, 2,812-2,826), echinoderm fragments, brachiopods, corals, trilobites, cephalopods, and bryozoa in the limestone conglomerate and probably transported (GSC locs. 53102, 3,124-3,126; 53101, 3,041-3,044; 53100, 3,026). Contact gradational with Unit 6, picked at first good conglomerate.	905	3,709

Unit	Lithology	Thickness (feet) Unit	Total from Base
6	Shale, and paper shale, slightly limy and limy, grey-black, weather grey-black, dark grey and black, commonly with an off-white mineral dusting, very recessive, fissility moderate to excellent, rarely very poor. Minor (1/2 to 5%) argillaceous limestone, very finely crystalline, grey and dark grey, weathers grey, dark grey, and yellowish grey, recessive, bedding 1/4 inch to 4 inches, some beds nodular and concretionary. Very rare siliceous limestone, very finely crystalline, dark grey, weathers grey, as discrete beds, 8 to 24 inches, some laminated. Bioclastic limestone bed at 2,503-2,504, conglomeratic at base, grading up into very finely crystalline limestone and obscurely into shale, rests on undisturbed shale. Impure chert bed at 2,399, 0-1 inch. Covered intervals at 2,701-2,711, 2,653-2,666 and 2,475-2,477. Straight cephalopods common, Tentaculites (?), coiled cephalopods, and brachiopods very rare (GSC locs. 53095, 2,709-2,710; 53094, 2,679-2,680; 53093, 2,482-2,488; 53092, 2,402; 53091, 2,327-2,332; 53090, 2,291-2,311; 53089, 2,161-2,186). Contact with less recessive unit 5 seemingly conformable.	643	2,804

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Road River Formation (952 feet), Silurian only		
5	Shale, limy, dark grey and grey-black, weathers grey-black and dark grey, moderately to very fissile; 2 to 10% argillaceous limestone, very finely crystalline, grey and dark grey, weathers grey and yellowish grey, bedding 1/2 inch to 2 inches. Monograptus, Tentaculites(?), and inarticulate brachiopods (GSC loc. 53088, 2,146-2,156). Contact with unit 4 gradational.	95	2,161
4	Shale, limy, dark grey, weathers dark grey and dark brownish grey, recessive but less so than units 3 and 5; argillaceous limestone, 10 to 50%, very finely crystalline, grey and dark grey, weathers grey, and yellowish grey, bedding 1 inch to 8 inches, commonly concretionary; paper shale, non-limy, weathers brownish black; rare grey siltstone, weathers dark brownish grey; rare siliceous limestone, weathers brownish grey. Monograptus, dendroid graptolites, Tentaculites (?), and brachiopods (GSC locs. 53087, 2,007-2,012; 53086, 1,989; 53085, 1,961-1,971).	105	2,066
3	Shale, limy, grey-black and dark brownish grey, weathers grey-black, dark grey, and brownish grey, recessive, moderately to very fissile; with very minor argillaceous limestone, very finely crystalline, dark grey and grey, weathers dark grey, grey, and yellowish grey, bedding 1/4 inch to 2 inches, some finely laminated; with laminated siltstone at 1648. Covered interval		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	at 1,652-1,688. Monograptus, Tentaculites (?), dendroid graptolites, and brachiopods (GSC locs. 53084, 1,906-1,911; 53083, 1,830-1,835; 53082, 1,813-1,814; 53081, 1,703-1,705).	315	1,961
2	Covered interval, with minor outcrops at 1,524-1,544 and 1,462-1,467 of shale, limy, dark brownish grey, weathers dark brownish grey, very fissile; siltstone, grey and light grey, weathers light brownish grey, bedding 1/4 inch to 8 inches, laminated.	437	1,646
	Ordovician and/or Silurian rocks		
1	Dolomite, mostly siliceous, coarsely to very finely crystalline, light brownish grey, light grey, brownish grey, and light olive-grey, weathers grey, light grey with buff stains, resistant, bedding 8 feet to massive; vugs and stringers common, of coarse dolomite and quartz; rare fine vuggy porosity. Limestone, amount to 80% of the interval 650-1,150, aphanitic, light brownish grey, light grey, grey, and dark grey, weathers light grey, grey and light bluish grey, resistant, bedding 6 inches to massive; stringers and vugs of dolomite and calcite common; rare stylolites; dolomitic mottling in a few beds. Covered intervals at 1123-1151 and 262-317. Corals present near top of unit. (GSC locs. 53080, 1,165-1,175; 53079, 1,016).	1,209	1,209

Section 7. PRONGS CREEK SECTION

A belt of recessive Silurian rocks dips steeply northwest off the flanks of the Wernecke Mountains near Prongs Creek at 65°18'N, 135°39-40'W. The lowest Silurian beds are best exposed in a minor flexure that repeats part of the section at 65°17'N, 135°42'W in a tributary creek of Prongs Creek, and the lowest 82 feet of strata were measured on the southwest limb of this syncline. The rest of the section was measured in Prongs Creek itself by staff and by tape in June when high water made the more resistant parts of the section inaccessible. The base of the section is a concordant contact with resistant limestone that forms the gorge of Prongs Creek. Upper Ordovician fossils were collected from the top of this unit in a more accessible outcrop farther upstream on the northeast limb of the synclinal flexure where it crosses the gorge of Prongs Creek. Outcrops are poor in the upper part of the section which ends within siliceous shales and argillites thought to be Devonian. Although exposures are mediocre, the section is very important for rocks with shelly and graptolitic faunas are interbedded. Trilobites, brachiopods, and graptolites have previously been described from the lowest Silurian beds by Raasch, Norford, and Wilson, 1961.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
37	Silty argillite, silty shale, thinly bedded argillaceous limestone, moderately recessive. Clams, coiled and straight cephalopods (GSC loc. 53131, 1,854-1,914, mostly from talus). Outcrops of higher beds continue.	60	1,914
	Silurian or Devonian rocks		
36	Limestone, argillaceous limestone, argillite, weather light grey and grey, slightly resistant.	20	1,854
35	Shale, some silty, some limy, others non-limy, greyish black, weathers dark grey and greyish black, recessive, somewhat platy. Argillaceous limestone, grey, weathers dull grey, bedding 1 inch to 8 inches. Chert		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	and cherty shale, greyish black, weather dark grey and greyish black, bedding 1/4 inch to 2 inches. Limy siltstone, dark grey, weathers dull grey, bedding 1 foot to 3 feet; some slump structures. Poorly exposed. ? Tentaculites at 1,645.	209	1,834
34	Covered interval.	598	1,625
33	Shale, limy, greyish black, weathers greyish black, very recessive, fissile; minor limy argillite at base, slightly siliceous, dark grey, weathers light grey, bedding 1/2 to 1 inch. Barren.	28	1,027
32	Limestone, very finely crystalline, grey, weathers grey and yellowish grey, bedding 6 to 12 inches; shale, some limy, greyish black, weathers greyish black and platy. Some limestone beds very fossiliferous, brachiopods, trilobites, straight cephalopods (GSC loc. 53132, 977-999).	22	999
31	Shale, non-limy, greyish black, weathers greyish black, recessive, fissile. Argillaceous limestone, some siliceous, very finely crystalline, grey and dark grey, weathers grey and light grey, somewhat resistant, bedding 1/2 to 1 inch; minor bedded cherts. Barren.	44	977
30	Shale, non-limy, greyish black, weathers greyish black with rusty stains. Argillaceous limestone, very finely crystalline to aphanitic, dark grey, weathers grey and light grey, bedding 3 to 18 inches. Minor		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	limestone, very finely crystalline, grey weathers light grey and grey, bedding 6 to 12 inches. Brachiopods, straight cephalopods, bryozoa, in the limestone only (GSC loc. 53133, 927-928).	24	933
29	Covered interval.	6	909
28	Limestone, very finely crystalline, dark grey, weathers light grey, bedding 6 to 24 inches, some beds nodular; minor shaly limestone. Very fossiliferous, brachiopods (GSC loc. 53134, 901).	10	903
27	Covered interval.	31	893
26	Limestone, very finely crystalline, dark grey, weathers dull grey, bedding 3 to 24 inches, nodular; minor shale; rare chert nodules. Brachiopods, corals (GSC loc. 53135, 850-851).	12	862
25	Argillite, slightly limy, greyish black, weathers light grey, poorly fissile; minor limestone, some argillaceous, some partly bioclastic, very finely crystalline, grey and dark grey, weathers grey, dull grey, dull bluish grey, yellowish grey, bedding 3 to 6 inches. Unit poorly exposed, covered intervals at 813-848, 797-805, 782-787 and 762-776. Brachiopods, corals (GSC loc. 53136, 797).	88	850
24	Limestone, some bioclastic, very finely crystalline, grey, weathers light grey and yellowish grey, somewhat resistant, bedding		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	3 to 12 inches; minor shaly argillite.	14	762
23	Limy argillite with minor argillaceous limestone and shale, recessive; some contortion in bedding.	16	748
22	Covered interval.	30	732
	Road River Formation (Silurian, only)		
21	Shale, non-limy, black, weathers black, very fissile; minor limy shale, greyish black, weathers black and greyish black, fissile, graptolitic; minor argillaceous limestone, some bioclastic, very finely crystalline, dark grey, weathers dark grey and grey, bedding 1 inch to 6 inches. Unit poorly exposed, covered intervals at 686-691, 672-684 and 649-667. Graptolites, brachiopods, echinoderm fragments (GSC loc. 53137, 649-702).	53	702
20	Limestone, very finely crystalline, dark grey and grey, weathers light grey and yellowish grey, bedding 6 to 36 inches. Unit somewhat resistant but 20% covered. Brachiopods, corals (GSC loc. 53138, 634).	34	649
19	Covered interval, greyish black shale in talus and possible slumped outcrop; poor graptolites in talus.	48	615
18	Argillaceous limestone, very finely crystalline, dark grey, weathers yellowish grey, bedding 1 to 6 inches. Minor folds present.	10	567
17	Covered interval with 4 feet of shale outcropping at base.	23	557

Unit	Lithology	Thickness (feet) Unit	Total from Base
16	Limestone, some bioclastic, very finely crystalline, grey, weathers light grey and yellowish grey, moderately resistant, bedding 3 to 24 inches; minor black shale and greyish black limy argillite. Covered interval at 513-516.	49	534
15	Argillaceous limestone, thinly bedded, recessive; shale interbeds.	5	485
14	Limestone, some bioclastic, some nodular, resistant, similar to those of unit 16, bedding 1 foot to 6 feet. Brachiopods, corals (GSC loc. 53139, 469-471).	32	480
13	Argillaceous limestone, thinly bedded, recessive, somewhat fissile. Black argillite, amounting to 50% of unit.	11	448
12	Limestone, some bioclastic, very finely crystalline, bluish grey, weathers bluish grey and yellowish grey, resistant, bedding 6 inches to 3 feet.	25	437
11	Limestone, with argillite and shale that amount to 40% of unit. Graptolites (GSC loc. 53140, 410).	22 1/2	412
10	Limestone, bedding 1 foot to 3 feet, moderately resistant; 20% argillite and shale. Corals (GSC loc. 53141, 393).	15	389 1/2
9	Shale, greyish black and black, poorly fissile argillite and minor argillaceous limestone and limestone; recessive. Covered interval at 337-343. Graptolites (GSC loc. 53142, 358).	51 1/2	374 1/2

Unit	Lithology	Thickness (feet) Unit	Total from Base
8	Limestone, bioclastic, somewhat argillaceous.	5	323
7	Shale and limy argillite, recessive, minor argillaceous limestone and rare chert bedded and as nodules within limestone. Covered intervals at 307-321 and 297-303. Graptolites (GSC loc. 53143, 278-280).	45	318
6	Limestone, argillaceous, grey, weathers dull grey, bedding 6 1/2 feet. Brachiopods.	6 1/2	273
5	Argillite, limy, greyish black, weathers dull grey, recessive, bedding 6 to 24 inches, some lamination; minor black shale, non-limy. Graptolites (GSC loc. 53144, 248-249).	37 1/2	266 1/2
4	Limestone, argillaceous, some bioclastic, 20% shale and argillite. Brachiopods (GSC. loc. 53145, 223).	27	229
3	Covered interval, with outcrops at the top, of 7 feet of shale, slightly limy, greyish black, weathers greyish black, with graptolites (GSC loc. 53146, 201).	120	202
2	Shale, limy, greyish black, weathers greyish black with buff stains, recessive, bedding 12 to 36 inches, moderately to poorly fissile; with 8 to 20% argillaceous limestone, slightly siliceous, very finely crystalline to aphanitic, dark grey and brownish black, weathers grey and yellowish grey, bedding 6 to 12 inches. Graptolites in shale,		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	limestone barren (GSC locs. 53130, 45-60; 53129, 30-40; 53128, 20-30; 53127, 20-26).	64	82
1	Argillaceous limestone, very finely crystalline, to aphanitic, greyish black, weathers bluish grey, grey, yellowish grey, dull light grey, recessive, bedding 3 to 24 inches, rare pyrites present; minor (10 to 20%) shale, some limy, dark grey and black, weathers greyish black and black, recessive. Covered interval at 0-4. Trilobites, brachiopods, cephalopods, common in limestone, graptolites in shale (GSC locs. 53126, 10-18; 53124, 53147, 4-10). Contact with subjacent rocks covered but concordant.	18	18

Upper Ordovician rocks

Limestone, aphanitic, greyish black and dark grey, weathers light grey, light bluish grey, with buff stains, resistant, bedding 1 foot to 8 feet; calcite stringers and vugs common, rare black chert nodules, dolomitic mottles amount to 30% of some beds. Fossils common in top beds, corals, brachiopods, stromatoporoids, straight cephalopods, some corals not in their growth positions (GSC loc. 53121 from top 25 feet). Outcrops of lower beds of unit continue westward, the unit is probably several thousand feet thick, base not seen.

Section 8. CLEAR CREEK SECTION

Resistant Upper Ordovician carbonates form the core of an anticlinal fold about 6 miles west of Clear Creek at 65°24'N, 136°13'W. The section was measured on the north limb of the fold by A. W. Norris in late May.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Devonian rocks		
19	Shale, silty in upper part of unit, black and dark grey, weathers grey. Tentaculites, plants, goniatites (GSC locs. 50428, 50425, 50426).	30	1,000
18	Covered interval, with float of limy shale, black, weathers dark grey, fissile. Tentaculites, Coleolus, Styliolina, gastropods, plants, goniatites (GSC locs. 50431, 50429, 50427, 50628).	81	970
	Road River Formation (?)		
17	Covered interval, across valley.	about 390	889
	Ordovician rocks		
16	Limestone, medium crystalline, dark grey, weathers grey, bedding irregular; irregular thin layers of black chert. Corals, stromatoporoids (GSC locs. 50500 and 50504 (float) 499; 50501, 493; 50499, 478).	21	499

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
15	Covered interval with float of limestone, dark grey and black, weathers grey, bedding thin to medium, irregular; irregular thin layers of black chert. Corals (GSC loc. 50502).	12	478
14	Limestone, aphanitic, dark grey, weathers grey, resistant, bedding massive to medium, irregular; irregular fissures and masses of white calcite. Echinoderm fragments, brachiopods.	41	466
13	Dolomite, very finely crystalline, pale brown and light grey, weathers pale brown, granular.	5	425
12	Limestone, siliceous, finely crystalline, weathers dark grey, slightly mottled with grey, granular, medium bedded; interbedded aphanitic limestone, dark grey, weathers grey, massive; fissures of white calcite.	19	420
11	Dolomite, siliceous, finely crystalline, mottled light grey, weathers pale brown, granular, thinly bedded.	3	401
10	Limestone, aphanitic, dark grey, weathers grey, massive, breaks with conchoidal fracture; calcite fissures. Echinoderm fragments.	7	398
9	Dolomite, finely crystalline, light grey, weathers pale brown, granular, thinly bedded.	14	391

Unit	Lithology	Thickness (feet) Unit	Total from Base
8	Dolomite, siliceous, finely crystalline, mottled white, light grey, pale brown, weathers dark grey, granular, massive.	15	377
7	Dolomite, mostly siliceous, finely crystalline, pale brown, mottled pale brown and light purplish grey, weathers pale brown, light grey, dark grey, granular, thinly bedded; thin limestone interbeds.	about 53	362
6	Limestone, aphanitic, brownish grey, brown, weathers grey, bedding medium to massive; white calcite fissures.	36	309
5	Covered interval, float of aphanitic limestone, dark grey, weathers grey, bedding medium to thick; white calcite fissures. Siliceous dolomite float at 242-251. Echinoderm fragments, ostracods (GSC loc. 50498, 221).	91	273
4	Limestone, aphanitic to finely crystalline, grey to greyish black, weathers grey, bedding medium, irregular; irregular fissures of white calcite.	9	182
3	Covered interval.	14	173
2	Limestone, aphanitic, grey, weathers grey, bedding medium, irregular, stylolites at top of unit; numerous irregular thin fissures of white calcite.	25	159

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
1	Covered interval, float of aphanitic limestone, grey, brownish grey, weathers grey, light grey, medium to thickly bedded; some blocks fractured; fissures and fractures filled with white calcite. Gastropods.	134	134

Section 9. PAT LAKE NORTH SECTION

Mediocre outcrops of recessive rocks of the Road River Formation are exposed 8 miles north of Pat Lake by a creek in the northern limb of an anticline (65°13'N, 136°41'W). Measurement was by staff in early June when snow covered the lower part of the section, the base is therefore within the Ordovician part of the formation. The top is a thin carbonate tongue that greatly thickens eastward. Above this carbonate interruption, a very thick covered interval intervenes before ridge-forming Devonian limestones and probably represents a continuation of the Road River Formation together with recessive Devonian rocks.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Upper Ordovician rocks		
7	Limestone, some siliceous, very finely crystalline, grey, weathers light grey, light bluish grey, resistant, bedding 1 foot to 10 feet; some beds with bioclastic debris. Corals, brachiopods, stromatoporoids (GSC loc. 53078, 1,278-1,306). Greyish black shale float from gopher holes just above unit has biserial graptolites and suggests continuation of Road River Formation.	28	1,306
	Road River Formation (Ordovician only)		
6	Covered interval.	133	1,278
5	Shaly argillite, non-limy, grey weathers grey, brownish grey, recessive; minor dark grey, impure, bedded cherts; rare paper shale and shale. Covered interval, 1,075-1,095. Graptolites (GSC loc. 53077, 1,118-1,126).	211	1,145
4	Covered interval.	44	934

Unit	Lithology	Thickness (feet) Unit	Total from Base
3	Shaly argillite and shale, most non-limy, grey, greyish black, weather grey, dull grey, recessive. Argillaceous limestone, some siliceous, very finely crystalline, grey, dark grey, weathers grey, light grey, yellowish grey, recessive, bedding 2 to 18 inches, important in lower half of unit; minor impure bedded chert, black, weathers greyish black, bedding 1/2 inch to 6 inches, some laminated; minor paper shale, black, non-limy. Unit not well exposed, covered interval at 658-676. Graptolites, brachiopods (GSC loc. 53076, 839; 53075, 650-680; 53074, 618-623).	280	890
2	Covered interval.	102	610
1	Siliceous limestone, very finely crystalline to aphanitic, dark grey, weathers yellowish grey, grey, light brownish grey, bedding 1/2 inch to 15 inches, many beds weather platy, most beds ring under hammer; shales and shaly argillite, some limy; argillaceous limestone, very finely crystalline, dark grey, weathers grey, yellowish grey, bedding 1/2 to 1 inch; impure bedded chert, dark grey, black, weathers black, dark grey. Unit not well exposed, covered intervals at 401-430, 325-350, 70-96, 53-69 and 25-48. Graptolites, trilobites, brachiopods (GSC locs. 53073, 390-400; 53072, 212-225; 53071, 0-2).	508	508

Section 10. BLACKSTONE RIVER NORTH SECTION

The section is about 8 miles east of Blackstone River, near 65°41'N, 137°10'W, within the northern front of the Ogilvie Mountains. Measurement was by A. W. Norris in late May.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
20	Limestone, finely crystalline, black, light brownish grey, weathers light grey, medium bedded. Stromatoporoids (GSC loc. 50137, 3,238-3,241).	6	3,244
	Road River Formation and Devonian (?) rocks		
19	Covered interval, float of finely crystalline limestone and argillaceous limestone, dark grey, black, light grey, weathers light grey, pale orange, brownish grey.	601	3,238
18	Limestone, some argillaceous, finely crystalline to aphanitic, black, weathers dark grey, grey, thinly to medium bedded. Corals, brachiopods (GSC locs. 50156, 2,636-2,637 loose; 50159, 2,623-2,636; 50140 and 50142, 2,622-2,623).	18	2,637
17	Covered interval, in upper part float of limestone, black, finely crystalline, weathers dark grey and light grey. Brachiopod, echinoderm fragments (GSC locs. 50161, 2,577 loose; 50153, 2,542 loose).	394	2,619

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Ordovician rocks		
16	Covered interval, float of finely crystalline limestone, dark grey, weathers grey, probably thickly bedded to massive; chert. Silicified corals (GSC loc. 50554, 2,089-2,225 loose).	154	2,225
15	Limestone, dark grey, weathers grey, massive; nodules and lenses of light grey chert. Corals.	18	2,071
14	Covered interval, float of limestone, aphanitic to finely crystalline, brown, pale brown, weathers grey; also of pale orange brown weathering dolomite in upper part of interval. Corals (GSC loc. 50555, 2,043-2,053 loose).	242	2,053
13	Limestone, aphanitic to finely crystalline, brown, weathers grey, resistant, thickly bedded to massive; fractures filled with coarse white calcite.	171	1,811
12	Covered interval, float of finely crystalline limestone, pale brown; secondary coarse white calcite.	89	1,640
11	Limestone, aphanitic, pale brown, weathers grey, very resistant, massive to thickly bedded.	225	1,551
10	Dolomite, finely crystalline, brownish grey and dark grey, weathers grey, medium bedded. Snow covered at 1276-1300.	67	1,326

Unit	Lithology	Thickness (feet) Unit	Total from Base
9	Covered interval, float of finely crystalline dolomite, dark grey, weathers grey, dark grey; minor chert in lower part of interval. Snow may hide some outcrop within this unit.	131	1,259
8	Dolomite, finely crystalline, dark grey, dark brownish grey, grey, weathers dark grey, grey, bedding medium to massive; nodules and blebs of black chert in many beds, some chert weathers light grey. Snow covered at 1,101-1,115.	161	1,128
7	Dolomite, some with silty laminae, finely crystalline, dark grey, brownish grey, grey, brown, weathers grey, light grey, granular, medium to thinly bedded. Vuggy at 833-855; secondary coarse white calcite at 782-883. Covered intervals at 930-945, 855-890. Ghost corals at 890-930.	417	967
6	Covered interval, float of very finely crystalline siliceous dolomite, black, weathers very dark grey.	200	550
5	Dolomite, finely crystalline, grey, brownish grey, brown, dark grey, weathers grey, light grey, granular, bedding medium to thin; some beds weather vuggy. Covered intervals at 281-292, 199-231 and 150-156. Ghost corals (GSC loc. 50543, 167-199).	200	350

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
4	Dolomite, finely crystalline, very light grey, weathers very light grey, thinly to medium bedded; thin argillaceous dolomite in upper beds.	68	150
3	Dolomite, finely crystalline, pale brownish grey, pale brown, dark grey, brown, weathers grey, light grey, dark grey, granular, medium bedded; many beds weather vuggy. Corals (GSC locs. 50541, 56; 50540, 53).	51	82
2	Dolomite, finely crystalline, pale brown, weathers grey, light grey, granular, medium bedded; irregular nodules of light grey and white weathering chert in upper beds. Poorly preserved fossils (GSC loc. 50539, 18-26).	19	31
1	Dolomite, finely crystalline, greyish black, weathers dark grey, granular, thickly bedded; black chert lenses and nodules in upper beds. Corals (GSC loc. 50538 loose, 50 feet below zero footage).	12	12

Section 11. BLACKSTONE RIVER SECTION

The right bank of Blackstone River has very good exposure of the lower part of the Road River Formation at 65°24'N, 137°23'W. A thick covered interval separates the highest outcrop from resistant Devonian limestone. The base of the section is near Benchmark J6 1962 at the lowest exposed bed of a resistant dolomite unit that underlies the Road River Formation. This unit is thrust on top of resistant Middle Devonian limestone similar to that above the covered interval. Measurement was by staff and by tape in early June when high water prevented access to parts of the river bank (unit 4). Jackson and Lenz have previously measured this section and found about 350 feet of higher beds outcropping away from the main section. These higher rocks embrace the Lower Silurian graptolite zones of Diplograptus modestus to Monograptus spiralis (1962, pp. 33, 41-43).

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Road River Formation (Ordovician and Silurian)		
9	Argillite and shale, some non-limy, dark grey, weather dull grey, dark grey, recessive, bedding 1 inch to 18 inches in argillite, shale moderately to very fissile; argillaceous limestone, some siliceous, very finely crystalline to aphanitic, dark grey, weathers grey, dark grey, yellowish grey, bedding 2 inches to 4 feet; minor cherty argillite and impure chert, greyish black, weather dark grey, greyish black, bedding 1/2 to 1 inch. Covered intervals at 1491-1515, 1355-1407 and 1290-1308. Graptolites and rare brachiopods (GSC locs. 53070, 1,515-1,521; 53069, 1,485-1,491; 53068, 1,453-1,457; 53067, 1,322-1,326; 53066, 1,200-1,203; 53065, 1,132-1,139; 53064, 1,098 0"-1"; 53063, 1,060-1,061), rare trilobites and brachiopods in argillaceous limestone float near top of unit. Faulting present within unit, contact with unit 8 gradational.	462	1,521

Unit	Lithology	Thickness (feet) Unit	Total from Base
8	Limestone, slightly siliceous, some slightly argillaceous, finely crystalline to aphanitic, grey, dark grey, weathers dull yellowish grey, grey, bedding 1 inch to 30 inches; many beds ring when hit. Minor shale, shaly argillite, argillite, most limy, dark grey, greyish black, weather dull grey, greyish black; rare impure chert, greyish black, weathers greyish black, bluish black, bedding 1 inch to 2 inches, some beds laminated. Graptolites and rare brachiopods (GSC locs. 53062, 1,026-1,027; 53061, 987-988; 53060, 933 0"-3"; 53059, 900-905).	204	1,059
7	Limestone, slightly siliceous, ring when hit, argillaceous limestone, shaly argillite; rare bedded chert. Covered interval at 829-855. Graptolites (GSC loc. 53058, 823 0"-2"). Exposed part of unit is similar to unit 8.	56	855
6	Covered interval with very rare slumped outcrops of slightly siliceous limestone that rings when hit. Graptolites.	207	799
5	Argillite, limy shale, limestone, some argillaceous others slightly siliceous. Graptolites (GSC loc. 53057, 552-560).	40	592
4	Inaccessible outcrops along river bank. Jackson and Lenz list shale and shaly limestone for this interval which can be studied when the river is low.	227	552

Unit	Lithology	Thickness (feet) Unit	Total from Base
3	Limestone, aphanitic to very finely crystalline, grey, dark grey, light grey, weathers yellowish grey, grey, relatively resistant, bedding 3 inches to 2 feet; rings when hit, some beds with sub-conchoidal fracture, others closely and well jointed. Limy shale and shaly argillite, dark grey, weather dark grey, greyish black, bedding 1 inch to 15 inches. Trilobites, attremate brachiopods, graptolites (GSC locs. 53056, 323-324; 53055, 290, talus; 53054, 270-292). Contact with unit 2 concordant.	62	325
2	Limy shale, greyish black, weathers greyish black, dark brownish grey, recessive, fissility poor to good; minor argillaceous limestone, very finely crystalline, dark grey, greyish black, weathers grey, greyish black, yellowish grey, bedding 1 inch to 6 inches, some beds finely laminated. Covered interval at 245-253. Graptolites, trilobites (GSC locs. 53053, 254-260; 53052, 198; 53051, 162-175; 53050, 148-162). Contact with unit 1 concordant.	115	263
	Rocks of Cambrian and/or Ordovician age		
1	Siliceous dolomite, very finely to coarsely crystalline, light grey, grey, dark grey (some beds with off-white coarse crystals in a light grey matrix), weathers light grey, light bluish grey, grey, yellowish grey, with sugary weathered surface, resistant, bedding 6 inches to massive, indistinct; fine to coarse vugs, most filled with dolomite or calcite, but local 5%		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	vuggy porosity; very rare chert nodules; several thin argillaceous interbeds at 141. Very rare ghost cephalopods. Only upper part of unit exposed in measured section, elsewhere near Blackstone River the unit is estimated to be at least 600 feet thick and is thrust over Middle Devonian limestone (GSC loc. 53049 from 20 ft. of beds).	148	148

Section 12. OGILVIE RIVER SECTION

Ogilvie River cuts through an anticline at 65°23'-24'N, 138°15'W. A thrust cuts across the northern part of the structure and the section was measured on the right bank of the river in the southern limb. The core exposes the upper part of a resistant siliceous dolomite unit that is probably mainly Ordovician. A covered interval represents the Road River Formation and probably also recessive Devonian rocks, and is overlain by very resistant Middle Devonian limestone. Measurement was by staff and by tape in August when low water allowed access to the eastern bank of the river.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Middle Devonian rocks		
3	Limestone, very finely to finely crystalline, grey, dark grey, weathers light grey, pale yellowish grey, resistant, bedding 1 foot to 15 feet; bioclastic debris (chiefly echinoderm) in some beds; sparse calcite-filled vugs in some beds. Unit not measured, thickness estimated to be several hundred feet. Corals, stromatoporoids, gastropods, echinoderm fragments (GSC locs. 53264 about 90-110 feet above base of outcrop of unit, 53265 0-15 feet above base of outcrop of unit).		
	Road River Formation and (?) higher beds (Ordovician, ? Silurian, and ? Devonian)		
2	Covered interval with very rare outcrops of shale, limy and non-limy, greyish black and brownish black, weathers greyish black and yellowish grey; minor bedded chert, impure, some limy, dark grey, weathers dark grey, bedding 1/4 to 1 inch; minor argillaceous		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	limestone, dark grey, weathers dark grey and brownish grey, bedding 2 to 6 inches, irregular. Graptolites, trilobites, brachiopods, corals (GSC locs. 53266 from upper part of interval, 1 mile east of river, 53267 from lower part of interval in northern limb, 1/4 mile east of river).	about 1,200	about 2,624
	Rocks of probable Ordovician and (?) earlier age		
1	Siliceous dolomite, very finely to very coarsely crystalline, grey, dark grey, weathers grey, bluish grey, dull grey, with buff stains, resistant, bedding 1 foot to massive, commonly indistinct; vugs, veins, and stringers of coarse dolomite and quartz; rare, irregular dark chert nodules in lower half of unit; 3 to 5% vuggy porosity at 1,200, 860, 655 and 200. Barren. Only upper part of unit exposed and thickness given minimum only.	1,424	1,424

Section 13. NAHONI RANGE SECTION

The upper beds of the Road River Formation are exposed beneath Devonian rocks in an east-trending mountain in the Nahoni Range (65°29'N, 139°09'W). Measurement was by A. W. Norris in late August.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
14	Limestone, silty and argillaceous, medium crystalline, black; black shale interbeds. Trilobites, brachiopods (GSC loc. 54203 loose).	6	429
13	Shale, silty and sandy, weathers light orange brown. Covered interval 412, 423.	15	423
	Road River Formation		
12	Covered interval with outcrop at 395-397 of black shale, weathers black.	24	408
11	Limestone, sandy, medium crystalline, dark grey, weathers pale orange brown, thinly bedded; black shale interbeds. Graptolites (GSC loc. 54202).	6	384
10	Shale, black, weathers black, recessive, moderately to poorly fissile, some beds with hackly fracture; thin beds of ferruginous shale in lower beds; large brown-weathering clay ironstone nodules at 363-369.	44	378

Unit	Lithology	Thickness (feet) Unit	Total from Base
9	Shale, silty, some ferruginous, black, weathers black with rusty stains, poorly fissile, some beds with hackly fracture; recessive black shales; clay ironstone nodules at some horizons. Graptolites (GSC loc. 54201, 306).	46	334
8	Shale, black, fissile, with large clay ironstone nodules that weather rusty brown. Graptolites (GSC loc. 54191).	3	288
7	Shale, some ferruginous, some silty, black, dark grey, with rusty stains. Graptolites (GSC locs. 54200, 272-282; 54199, 258-272 loose).	27	285
6	Covered interval with outcrop at 208-211, of black shale, non-limy, very fissile. Graptolites (GSC loc. 54198, 208-211).	139	258
5	Shale, black, recessive; black silty shale, weathers platy, less recessive. Covered intervals at 107-115 and 90-93. Graptolites (GSC locs. 54197, 93-107; 54196, 83-90; 54195, 80-83; 54194, 78).	44	119
4	Sandstone, very finely grained, grey and dark grey, laminated, weathers light brownish grey, resistant.	3	75
3	Shale, non-limy, black, very fissile, recessive; more resistant silty black shale, very fissile, weathers black with yellowish orange stains. Graptolites abundant (GSC locs. 54193, 70-72; 54192, 67-70; 54190, 60-61; 54189, 57).	29	72

Unit	Lithology	Thickness (feet) Unit	Total from Base
2	Mudstone, non-limy, black, slightly recessive, blocky weathering, strongly and closely jointed; stringers of white dolomite.	4	43
1	Shale, non-limy, black, weathers black, lower beds recessive; rare clay ironstone nodules at 11. Graptolites abundant (GSC locs. 54188, 36; 54187, 24; 54186, 15; 54185, 0-1). Zero footage is base of outcrop.	39	39

Section 14. MONSTER RIVER HEADWATERS SECTION

Siliceous dolomites form talused hills at the headwaters of Monster River, resting with angular unconformity on Precambrian rocks (Green and Roddick, 1962, p. 4 and Map 13). Vuggy porosity is developed in many of the beds. The major part of the section is measured up a south-facing slope (64°55'N, 139°35'W) ending at 1,562 feet at a covered interval that hides a fault visible laterally. Additional strata may be present on the crest of the ridge and on its northern face (a moderately steep dip-slope) so that this figure gives only a minimum thickness for the dolomites.

Discontinuous exposures just north of the hills suggest that graptolitic shales of the Road River Formation immediately overlie the dolomites, but the contact is not exposed. Barren bedded chert outcrops locally beyond the belt of poorly exposed Road River Formation. These rocks probably represent either unit 13 (Middle Devonian to Carboniferous) or unit 15a (Carboniferous to Permian) of Green and Roddick, 1962. Measurement was by staff and by tape in August with minimal snow cover.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Rocks of Possible Devonian to Permian age		
13	Chert, grey-black, weathers grey, light grey, with lichen stains, recessive, bedding 1/4 inch to 4 inches; rare siliceous shale. Unit very poorly exposed, forms several talused ridges. Stratigraphic thickness unknown, barren.		
12	Covered interval, stratigraphic thickness only estimated.	about 100	
	Road River Formation (Ordovician and Silurian)		
11	Shale, limy, dark grey, weathers dark grey, very recessive. Graptolites (GSC loc. 53274).	10	

Unit	Lithology	Thickness (feet) Unit	Total from Base
10	Covered interval, stratigraphic thickness only estimated.	about 300	
9	Shale, limy, greyish black, weathers greyish black, very recessive, moderately to very fissile; very rare bedded chert and argillaceous limestone. Graptolites (GSC loc. 53273, 1,658 0"-3").	5	1,661+
8	Shale, limy, dark grey, greyish black, weathers dark grey, greyish black, grey, recessive, moderately to very fissile; graphitic sheen on some partings. Paper shale, limy, brownish black, greyish black, weathers black, very recessive, very fissile; commonly with off-white mineral dusting. Chert, dark grey, weathers dark grey, greyish black, recessive, bedding 1/2 inch to 3 inches, amounting to 5 to 10% of unit. Argillaceous limestone, dark grey, weathers grey, light grey, recessive, bedding 1/2 inch to 8 inches, amounting to 10 to 20% of interval 1,642-1,656, and as large concretions at some horizons in interval 1,586-1,610. Graptolites, except in the bedded cherts (GSC locs. 53272, 1,655 0"-6"; 53271, 1,646-1,647; 53270, 1,620-1,622; 53269, 1,592 0"-6").	70	1,656+
7	Shale, limy, brownish black, black, weathers greyish black, black, brownish black, very recessive, soft, moderately to very fissile; rare calcite stringers and rare pyrites. Graptolites (GSC loc. 53268, 1,562-1,564).	24	1,586+

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
6	Covered interval including top and back-slope of mountain, and containing a projected fault. Stratigraphic thickness unknown, could be negligible or several hundred feet; base positioned at last outcrop of unit 5, and top at base of outcrop of unit 7.	?	1,562+
	Rocks of probable Cambrian and/or Ordovician age		
5	Siliceous dolomite, finely to medium crystalline, light grey, weathers light grey, bedding 6 inches to 1 foot; with up to 20% irregular silicified layers that weather dark brownish grey. Barren.	7	1,562
4	Covered interval.	533	1,555
3	Siliceous dolomite, finely to medium crystalline, light brownish grey, light grey, pale yellowish brown, grey, weathers light grey, bedding 1 foot to massive, commonly indistinct; rare calcite-filled vugs; rare poorly silicified patches. Covered intervals at 995-1,008, 967-983, 876-958 and 820-834. Barren.	270	1,022
2	Covered interval with rare outcrops of light grey weathering siliceous dolomite.	161	752
1	Siliceous dolomite, some slightly limy, very finely to very coarsely crystalline, light brownish grey, grey, yellowish grey, yellowish white, weathers light grey, whitish grey, resistant, bedding 1 foot to massive, commonly		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	indistinct; calcite-filled vugs common; dolomite stringers; poor silicification at a few horizons; commonly with 2 to 5% vuggy porosity. Covered intervals at 560-568, 511-529, 485-498, 102-124 and 65-70. Barren except for echinoderm fragments at 400 (GSC loc. 53394). Small covered interval (18 feet) below unit 1, but from neighbouring hillsides, the basal contact is an angular unconformity.	591	591
	Precambrian rocks		
	Quartzite, slightly dolomitic, very finely crystalline, weathers dark yellowish orange, yellowish brown, bedding 1 inch to 24 inches, some lamination, some crosslamination; shaly interbeds. Barren. Only uppermost beds examined.		

Section 15. TATONDUK RIVER HEADWATERS SECTION

Two major unconformities can be demonstrated in poorly exposed ridge outcrops near 65°23'N, 140°18'W, 6 miles west-northwest of Mt. Klotz. Talused Middle Devonian limestone rests on a recessive Ordovician sliver of the Road River Formation that caps resistant barren carbonates. These carbonates (units 4 and 5) lie with sharp angular unconformity on quartzite and siliceous argillite of probable Precambrian age, but locally siliceous dolomite intervenes. This dolomite is lost by overstep in outcrops where units 4 and 5 rest directly on the quartzite, but there is no exposure showing dolomite (units 1 and 2, possibly in part equivalent to Map-unit 6 of Green and Roddick, 1962) overlying the quartzite. The section was measured on the southeast face of a ridge with a covered interval separating units 2 and 4, but discord is apparent between their bedding, with the attitude of units 1 and 2, approximating that of quartzites directly underlying units 4 and 5 in exposures 2 miles to the east. Igneous rocks intrude units 1 and 2 but are not seen to cut younger strata. Measurement was by staff in August when snow cover was minimal.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Road River Formation (Ordovician)		
8	Covered interval with dark grey weathering float of argillaceous limestone and chert, with brachiopods, cephalopods, graptolites. Thought to be talus covered outcrops similar to unit 7, but probably with more shale present. Overlain by another, but distinct, covered interval with float of lighter grey weathering limestone thought Middle Devonian (GSC loc. 53263 from float about 200 feet above unit 8).	about 70	
7	Limestone, somewhat argillaceous, very finely crystalline with bioclastic debris, dark grey, weathers grey, recessive, bedding		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	1 inch to 8 inches; some irregular silicification. Brachiopods, straight cephalopods, corals, graptolites, ostracods, trilobites, sponge spicules (GSC locs. 53261 and 53262).	3	1,598
6	Covered interval.	4	1,595
	Rocks of probable Cambrian and/or Ordovician age		
5	Limestone, pelletoid, light brownish grey, grey, brownish grey, light grey, light olive-grey, weathers light grey, light bluish grey, with rare light buff stains, resistant, bedding 1 foot to massive; rare fragments of aphanitic limestone associated with the pellets of similar aphanitic limestone; rare dolomite crystals that project from weathered surfaces; rare aphanitic limestone, light grey, light brownish grey, weathers light grey, bedding 4 feet to massive. Barren. Contact with unit 4 concordant, probably gradational.	501	1,591
4	Dolomitic limestone and limy dolomite, most are slightly siliceous, medium to very coarsely crystalline, off-white, whitish grey, weather light grey, light bluish grey, grey, bedding 2 feet to massive, commonly poorly defined; thick white calcite veins common. Unit measured close to a fault, probably similar to unit 5 but recrystallized. Covered interval at 610-625. Barren.	550	1,090

Unit	Lithology	Thickness (feet) Unit	Total from Base
3	Covered interval, thickness inaccurate due to differing attitudes above and below. Longitudinal fault thought to be present in interval and also angular unconformity beneath unit 4 that elsewhere rests unconformably on thinly bedded quartzite and siliceous argillite of probable Precambrian age. These latter rocks are thought older than unit 1.	about 300	540
2	Shale, non-limy, black, greyish black, weathers greyish black with light brown stains, recessive; minor siliceous dolomite, very finely crystalline, brownish grey, weathers light brownish grey, bedding 6 to 12 inches, with contorted lamination within some beds. Barren. Contact with unit 1 concordant.	28	240
1	Siliceous dolomite, very finely crystalline, grey, light grey, light brownish grey, weathers grey, light grey, light brownish grey, light greyish orange, relatively recessive, bedding 3 inches to 3 feet, many beds weather platy; rare greyish black chert nodules in some beds; irregular silicification laminae and networks in some beds. Unit poorly exposed, covered intervals at 174-196, 94-107, 62-72 and 25-58. Barren. Only upper part of unit exposed and measured.	212	212

Section 16. MOUNT BURGESS SECTION

The Devonian rocks that form Mount Burgess overlie dolomites that outcrop on an unnamed mountain east of Mount Burgess at 66°03'N, 139°35'W. Measurement was by A. W. Norris in mid-August.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian (?) rocks		
23	Shale, silty and sandy, brownish red, reddish brown; layers of pebble conglomerate, matrix silty shale, subround to round pebbles of dark grey, black, and brown chert; sandstone interbeds in the upper beds, limy, argillaceous, reddish brown, weathers yellowish brown. Covered intervals at 3,598-3,610, 3,564-3,582. Trilobites, ostracods, brachiopods (GSC locs. 54286, 3,616-3,627; 54891, 3,615).	63	3,627
	Ordovician and probably older rocks		
22	Limestone, some slightly dolomitic, aphanitic, pale brown, weathers light grey, thinly to thickly bedded; irregular nodules of light brown and black chert; upper beds poorly exposed. Brachiopods.	18	3,564
21	Limestone, finely crystalline, very light grey, weathers light creamy grey, resistant, massive.	31	3,546
20	Dolomite, finely to very finely crystalline, off-white, light grey and pale brown mottled, grey, weathers very light grey, grey, light grey, resistant, massive. Covered interval at 3,367-3,371.	148	3,515

Unit	Lithology	Thickness (feet) Unit	Total from Base
19	Limestone, some dolomitic, finely crystalline, dark grey, black, weathers grey, resistant, massive to medium bedded; black chert nodules in upper beds. Ostracods (GSC loc. 54886, 3,357-3,367).	71	3,367
18	Limestone, finely crystalline, black, weathers dark grey, black, recessive, very thinly bedded. Trilobites, inarticulate brachiopods (GSC loc. 54290).	14	3,296
17	Dolomite, finely crystalline, light grey, pale brown, grey, weathers very light grey, grey, granular, some beds resistant, massive to medium bedded. Porosity at 3,219-3,268. Cephalopods (GSC loc. 54885, 3,271).	203	3,282
16	Covered interval, poor outcrops at 3,066-3,071 of finely crystalline grey limestone, weathers very light grey, medium bedded. Fragmentary fossils.	26	3,079
15	Dolomite, finely to medium crystalline, pale brownish grey, light grey, brown, grey, some beds mottled, weathers light grey, grey, granular, some beds resistant, others recessive, massive to medium bedded. Porosity at 3,030-3,042. Ghost brachiopods.	98	3,053
14	Dolomite, finely crystalline, dark grey, light grey, grey, some beds mottled, weathers pale orange-brown, pale orange, granular, massive to thinly bedded.		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Covered intervals at 2,926-2,929, 2,920-2,922, 2,898-2,907 and 2,881-2,887. Fragmentary fossils (GSC loc. 54883, 2,950-2,955).	120	2,955
13	Dolomite, medium to finely crystalline, light grey, pale brown, grey, very light grey, weathers pale brownish grey, very light grey, orange-brown, pale pinkish grey, some beds resistant, some beds granular, massive to thickly bedded; lenses and nodules of chert at 2,653, 2,593-2,595. Fine vuggy porosity at 2,697-2,730, 2,649-2,658, 2,594-2,611, 2,507-2,515, 2,476-2,502, 2,439-2,452, 2,382-2,387, 2,297-2,299. Covered intervals at 2,767-2,782, 2,754-2,759, 2,658-2,681, 2,644-2,649, 2,620-2,625, 2,574-2,577, 2,515-2,551, 2,379-2,382, 2,360-2,366, 2,325-2,329, 2,293-2,297 and 2,203-2,209. Fragmentary fossils (GSC loc. 54481, 2,577).	about 695	2,835
12	Covered interval, minor outcrops at 1,807-1,819, 1,691-1,698, 1,586-1,591 and 1,533-1,536, of dolomite, finely crystalline, grey, light brown, weathers light brown, light brownish grey, granular, thickly bedded.	618	2,140
11	Dolomite, some siliceous, medium crystalline to aphanitic, light brown, grey, light grey, weathers pinkish grey, thickly to medium bedded; black chert nodules and stringers at 1480-1483.	47	1,522

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
10	Covered interval, minor outcrops at 1,459-1,469, 1,315-1,331 and 1,182-1,186, of dolomite, finely to medium crystalline, grey, pale brown, weathers brownish grey, dark brown, thickly bedded to massive; irregular masses of black chert at 1,315-1,331.	318	1,475
9	Dolomite, finely crystalline, dark grey, pale brown, brownish grey, light grey, weathers pale brownish grey, brownish grey, light grey, light brown, some beds granular, some beds resistant, thickly bedded to massive; irregular black chert nodules at 983-987. Covered intervals at 1,139-1,151, 1,115-1,137, 1,097-1,101, 1,081-1,086, 1,065-1,071, 1,050-1,060, 1,009-1,024, 987-995, 969-972 and 945-949.	232	1,157
8	Dolomite, medium crystalline to aphanitic, dark grey, light grey, pale brown, weathers light pinkish grey, grey, some beds resistant, medium bedded to massive. Covered interval at 892-896.	45	925
7	Black chert, single bed.	1	880
6	Dolomite, medium crystalline to aphanitic, dark grey, grey, pale brown, brownish grey, weathers pale brown, brown, dark grey, brownish grey, grey, some beds resistant, some beds granular, most beds massive. Thin lenticular dark grey chert beds at 605-605 1/2, 582-582 1/2, thin lenses and nodules of black chert at 511-528. Fine vuggy porosity		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	at 851-857, 842-848, 797-809, 715-721, 671-684, 546-561. Covered intervals at 857-865, 848-851, 834-842, 809-814, 794-797, 721-769, 710-715, 696-702, 686-693, 666-671, 634-636, 586-593, 561-567 and 528-541.	368	879
5	Limestone, argillaceous, weathers dark grey-brown, laminated, thinly bedded, fissile.	2	511
4	Covered interval, with minor outcrops at 506-509, 443-446, 411-415, 370-390, 349-360 and 337-344, of dolomite, some argillaceous and silty, finely crystalline to aphanitic, brownish grey, grey, light grey, weathers brownish grey, light grey, pale brown, pale pinkish grey, medium bedded; lenses of black chert in some beds.	171	509
3	Black chert, single irregular bed.	2	338
2	Dolomite, finely crystalline and aphanitic, dark grey, light brown, brown, light grey, weathers dark grey, grey, brownish grey, light grey, light brown, bedding medium to massive, some beds resistant; lenticular masses of grey chert at 90-114. Covered intervals at 63-72, 43-45 and 23-28.	318	336
1	Dolomite, argillaceous, aphanitic, dark grey, weathers light orange-brown, irregularly and thinly bedded. Zero footage is base of outcrop.	18	18

Section 17. KEELE RANGE SECTION

Talus covers most outcrops in the Keele Range and stratigraphic sections are very unsatisfactory. The section was measured by staff in late August, with minimal snow cover, on the northwest face of a ridge at 66°58'N, 140°46'W, about 8 miles north-northwest of Bluefish Lake. Rocks stratigraphically higher and lower than those of the section outcrop elsewhere along the same ridge but cannot be satisfactorily related.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Rocks of Silurian or Devonian age		
8	Siliceous dolomite, very finely crystalline to aphanitic, grey, brownish grey, dark grey, weathers light grey, yellowish grey, grey, recessive, bedding 2 to 18 inches, many bedding planes stylolitic; some beds with rare small silica-filled vugs. Unit poorly exposed, about 45% scattered outcrops. Barren.	244	621
7	Siliceous and very siliceous dolomite, very finely crystalline to aphanitic, grey, weathers light grey, light brownish grey, bedding 6 inches to 5 feet, some bedding planes stylolitic; rare dolomite stringers; some beds with rare silica-filled vugs. Covered intervals at 343-351, 282-286, 260-264, 251-256 and 245-248. Barren.	176	377
6	Covered interval with an outcrop at 162-166 of very siliceous dolomite, grey, weathers light grey, dark yellowish orange, with lichen stains, bedding 3 to 24 inches, some bedding planes stylolitic; rare dolomite and quartz stringers. Barren.	59	201

Unit	Lithology	Thickness (feet) Unit	Total from Base
5	Siliceous dolomite, very finely crystalline to aphanitic, grey, weathers brownish grey, grey, with lichen stains, bedding 3 inches to 3 feet, some bedding planes stylolitic; rare small vugs, some filled with dolomite, others with silica. Covered intervals at 107-109, 62-74 and 54-56. Barren.	91	142
4	Covered interval.	41	51
3	Siliceous dolomite, very finely crystalline to aphanitic, grey, weathers grey, brownish grey, with lichen stains, bedding massive; coarse white dolomite stringers, veins, and networks. Barren.	10	10
2	Covered interval, within which section crosses small creek valley. Thickness only an estimate.	about 50-100	
1	Siliceous dolomite, finely to very finely crystalline, dark grey, grey, weathers grey, brownish grey, with lichen stains, bedding 3 inches to 2 feet; some beds biostromal, some beds with about 5% chert nodules. Corals, brachiopods, stromatoporoids, straight cephalopods (GSC loc. 53286). Beds slumped and frost-heaved, no satisfactory outcrops beneath this horizon.	about 40	

Section 18. CANYON CREEK SECTION

The deep gorge of Canyon Creek cuts through the west flank of the Richardson Mountains and gives excellent exposures of the Road River Formation at 66°10' N, 136°05'W, but parts of the formation are missing due to faulting. The section starts within the uppermost beds of the lower part of the formation at the lowest outcrop at the east end of the gorge. Some faults, a syncline, and the associated anticline, interrupt the section but marker beds allow its continuation at the west end of the gorge where the Devonian Imperial Formation rests disconformably on the Road River Formation. Measurement was by staff and by tape in late May when snow cover was unimportant.

Graded arenitic limestone, breccia, and conglomerate that contain exotic limestones suggest turbidity current deposition for some beds in the Ordovician Units 3 to 16.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Imperial Formation (Devonian)		
22	Shale, olive-grey, olive-brown, brown weathers similar colours. Siltstone, dark olive-grey, weathers olive-grey, dark yellowish orange, bedding 1 foot to 2 feet. Unit less recessive than unit 21, about 150 feet exposed. Contact with unit 21 disconformable with minor erosion.		
	Road River Formation (Ordovician and Silurian)		
21	Shale, non-limy, greyish black, black, weathers greyish black, brownish black, dark reddish brown, recessive, very fissile. Graptolites, rare inarticulate brachiopods (GSC locs. 53048, 3,381; 53047, 3,339-3,354; 53046, 3,297; 53045, 3,291-3,292). Contact with unit 20 gradational.	99	3,383

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
20	Shale, non-limy, greyish black, weathers dull dark grey; some beds somewhat siliceous. Chert, greyish black, bluish black, weathers greyish black, dull black, bedding 1/2 inch to 6 inches; some beds with hackly fracture; very rare siliceous limestone and calcarenite beds. Graptolites (GSC locs. 53044, 3,273-3,274; 53043, 3,190-3,192; 53042, 3,180 0"-6"). Contact with unit 19 gradational.	175	3,284
19	Chert, bluish black, greyish black, black, weathers greyish black, dark reddish brown, bluish black, recessive, bedding 1/2 inch to 8 inches; some impure beds are laminated. Shale, somewhat subordinate to chert, non-limy, greyish black, weathers dull grey, greyish black, brownish grey, fissile; beds of siliceous limestone at 3,046-3,048 and 3,039-3,042, very finely crystalline, dark grey, weathers yellowish grey, bedding 2 feet and 3 feet. Minor faults and folds present within unit. Graptolites in uppermost beds (GSC loc. 53041, 3,095 0"-8").	140	3,109
18	Covered interval with very rare shale outcrops, some with very steep dips. Major fault thought to be present within this interval, faulting high Ordovician and low Silurian strata out of the section.	121	2,969

Unit	Lithology	Thickness (feet) Unit	Total from Base
17	Chert, some argillitic, black, greyish black, weathers bluish black, bedding 1/2 inch to 6 inches. Shaly argillite and shale, limy, greyish black, weathers greyish black; rare argillaceous limestone, very finely crystalline, grey, weathers yellowish grey, bedding 1/2 inch to 2 inches. At 2,830-2,840, rare large concretions of argillaceous limestone. Graptolites (GSC locs. 53040, 2,830-2,840; 53039, 2,772-2,774). Contact with unit 16 concordant.	89	2,848
16	Limestone conglomerate, rounded boulders of siliceous limestone and chert, limestone matrix; siliceous limestone; minor shale, chert; some chert nodules in carbonates. Indistinct thick bedding, resistant.	50	2,759
15	Chert, bluish black, weathers bluish black, dark brown, reddish brown, bedding 1/2 inch to 6 inches. Cherty argillite and cherty shale, dark grey, weathers dull grey, bedding 1 inch to 6 inches; minor shale; minor siliceous limestone. Thin limestone conglomerate beds at 2,700 and 2,625; coarse calcite veins at 2,675. Rare graptolites in shales (GSC loc. 53038, 2,623 0"-1"). Abrupt concordant contact with unit 14.	234	2,709
14	Limestone, calcarenite, poorly sorted, dark grey, weathers yellowish grey, very resistant, bedding massive, just a single bed 23 feet thick; chert nodules present in basal part.		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Contact concordant with unit 13, no erosion visible.	23	2,475
13	Limestone, calcarenitic, poorly sorted, light grey, weathers yellowish grey, resistant, bedding 6 inches to 6 feet; basal 2 or 3 inches of many beds are poorly sorted pebble breccia-conglomerate, and grade upwards into calcarenite; siliceous limestone, very finely crystalline, bedding 2 to 8 inches, with some chert nodules; minor chert, bluish black, weathers dull greyish black, bedding 1 inch to 6 inches; minor shale. Coarse calcite veins at 2,400. Contact with unit 12 concordant, no erosion visible.	121	2,452
12	Shale, with minor chert and siliceous argillaceous limestone; very rare, thin beds of limestone breccia-conglomerate. Graptolites.	71	2,331
11	Chert, bluish black, black, weathers dull greyish black, bluish black, bedding 1/4 inch to 10 inches, some beds laminated. Shaly argillite and shale, some limy, greyish black, brownish black, weather dull grey, reddish brown, bedding 1/2 inch to 10 inches. Limestone, mostly siliceous, very finely crystalline, dark grey, weathers yellowish grey, dull grey, bedding 1/2 inch to 8 inches; rare chert nodules and chert layers. Rare limestone breccia-conglomerate, some dolomitic, light grey, dark grey, weathers yellowish grey, resistant, as discrete beds, 1/2 inch to 3 feet thick, that thin laterally; matrix very finely		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	crystalline; angular sharpstones to subround roundstones, coarse cobbles to fine sand, poorly sorted, of light grey limestone and rarely chert, concentrated at the bases of most beds, grading upwards into fine to medium sand at the tops of the beds; tops of some beds abrupt, others grade upwards into limestone or chert; shallow erosion surfaces discernible at the bases of most beds; rare erosion surfaces within beds. Graptolites in shales (GSC locs. 53037, 1,942-1,945; 53036, 1,896-1,898). Contact with unit 10 abrupt, marked by shallow erosion surface (1 inch deep) beneath a chert bed.	470	2,260
10	Dolomite conglomerate, light grey, dark grey, weathers yellowish grey, yellowish orange, resistant, bedding massive, just a single bed 16 feet thick; matrix very finely crystalline dark grey dolomite, about 30% of rock; roundstones subangular to subround, cobbles to coarse sand at base of bed, grading upwards to pebbles to coarse sand at top, monomict, of light grey, very finely crystalline to aphanitic, dolomite. Contact concordant with unit 9.	16	1,790
9	Chert, recessive, bedding 1 inch to 6 inches; minor shale; minor calcarenitic graded limestone. Gradational contact with unit 8.	39	1,774
8	Limestone, some siliceous, very finely crystalline to aphanitic, grey, weathers yellowish grey, grey, bedding 1/2 inch to 4 feet; rare chert nodules; conglomeratic limestone, containing subround		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	pebbles of similar limestone and of chert, some beds with contorted (? slumped) lamination between undisturbed bedding planes; chert, black, greyish black, weathers greyish black, bedding 1 inch to 6 inches; minor shale. Gradational contact with unit 7.	140	1,735
7	Shale, some limy, greyish black, black, weathers greyish black, brownish black, recessive, bedding 1/2 inch to 12 inches. Siliceous limestone, some argillaceous, very finely crystalline, grey, dark grey, weathers yellowish grey, grey, bedding 1 inch to 12 inches; some beds with elongate black chert nodules. Minor argillaceous chert, greyish black, weathers greyish black, bedding 1/2 inch to 8 inches. Rare calcarenitic graded limestone as discrete beds, 2 to 8 inches thick. Covered interval at 1,393-1,419. Gradational contact with unit 6.	232	1,595
6	Limestone, mostly siliceous, some also argillaceous, very finely crystalline, greyish black, dark grey, weathers yellowish grey, grey, bluish grey, reddish brown stained, bedding 1 inch to 18 inches; rare chert nodules at 1,250; rare pyrites at 1,225; at 1,049-1,054, basal parts of beds are arenitic breccia and conglomerate, grading up into very finely crystalline limestone, subangular sharpstones to subround roundstones, monomict, small pebbles to sand, of light grey limestone; cross lamination locally present in		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	upper parts of some of these beds. Subordinate shale and shaly argillite, greyish black, dark grey, weathers grey, greyish black, dark brownish grey. Covered interval at 1,185-1,221. Graptolites in shale (GSC locs. 53035, 1,326; 53034, 1,054 8"-9"). Contact gradational with unit 5.	314	1,363
5	Shale and shaly argillite, some silty, some limy, greyish black, weathers dark grey, dark brownish grey. Subordinate siliceous limestone, very finely to finely crystalline, dark grey, weathers grey, yellowish grey, bedding 2 to 8 inches. Graptolites in shale.	82	1,049
4	Limestone breccia-conglomerate, grey, greyish black, weathers yellowish grey, grey, very resistant, bedding massive, just a single bed 19 feet thick; matrix very finely crystalline greyish black limestone; subangular sharpstones to subround roundstones, small boulders to fine pebbles at base of bed, grading upwards to fine to coarse pebbles at top, monomict, of light brownish grey, very finely crystalline limestone. Abrupt concordant contact with unit 3.	19	967
3	Limestone, mostly siliceous, some also argillaceous, very finely crystalline to aphanitic, greyish black, dark grey, grey, weathers yellowish grey, grey, light grey, bedding 1/2 inch to 6 inches; some beds with rare chert nodules; rare		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	graded beds (above 800), basal parts fine conglomerate, upper parts finely to very finely crystalline, rarely laminated and cross laminated. Chert, some argillitic, some limy, bluish black, greyish black, black, weathers greyish black, grey, bedding 1/2 inch to 6 inches, rare beds with fine lamination. Shale, mostly limy, greyish black, weathers greyish black, brownish black, bedding 1/2 inch to 8 inches, fissility medium to very good. Covered interval 665-694. Graptolites and rare inarticulate brachiopods (GSC locs. 53033, 924; 53032, 862; 53031, 503-504).	451	948
2	Shale, mostly limy, greyish black, weathers greyish black, reddish brown, recessive. Argillaceous limestone, some slightly siliceous, very finely crystalline to aphanitic, dark grey, weathers grey, yellowish grey, dull grey, bedding 3 to 24 inches. Rare chert, black, weathers greyish black, bedding 1/2 inch to 2 inches. Unit poorly exposed, covered intervals at 492-497, 472-490 and 432-464. Contact gradational with unit 1.	187	497
1	Limestone, slightly siliceous, some argillaceous, very finely crystalline to aphanitic, greyish black, dark grey, grey, weathers yellowish grey, dull grey, dull bluish grey, relatively resistant; shaly interbeds; sparse black chert nodules from 0-150; rare calcite stringers and veins; erosion surface 4 inches deep at 9. Barren.	310	310

Section 19. TRAIL RIVER SECTION

The belt of outcrops of the Road River Formation in the eastern flanks of the Richardson Mountains commonly contains faulting that does not allow measurement of continuous sections of the formation. This is a partial section that covers 1,230 feet of the lower part of the formation, bounded by two faults with unknown but significant displacements. Outcrops of the Road River Formation continue beyond both these faults, and Section 20 includes some of the upper beds of the formation. Minor faults and folds occur within the section. Measurement was by staff along the south bank of the river at 66°25'N, 135°32' W in July when snow cover was absent but high water prevented access to parts of the river bank.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Road River Formation (Cambrian part)		
5	Limestone, very finely crystalline, dark grey, weathers grey, dark grey, yellowish grey, greyish yellow, bedding 1/2 inch to 6 inches; very rare shale interbeds. Conglomeratic limestone at 1,200-1,208 and 1,103-1,105, with elongate slabs of limestone at low angles to bedding, and smaller fragments at greater angles. Fault at 1,160. Graptolites in lowest beds of unit.	136	1,230
4	Limestone, some argillaceous, very finely crystalline, grey, weathers grey, dark bluish grey, yellowish grey, bedding 2 to 24 inches; about 20% shaly argillite and shale, limy, dark grey, weather dark grey, yellowish grey. At 1,084-1,087, several thin bioclastic limestone beds, lenticular, bedding 2 to 6 inches, mostly composed of trilobite and brachiopod debris. Fault at 1,078. Graptolites, inarticulate brachiopods, trilobites (GSC locs. 53165, 1,087, 0"-1";		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	from a bioclastic limestone, 53164, 1,066).	44	1,094
3	Limestone, very finely crystalline, grey, dark grey, bluish grey, weathers greyish yellow, grey, bluish grey, light grey, bedding 1/2 inch to 4 inches, some beds platy, some beds banded on weathered surfaces; very rare bioclastic layers; very rare black chert nodules; very rare shale, limy, dark grey, dark brownish grey, weathers dark grey, dark brownish grey, yellowish grey, fissility poor to good. At 1,000, 860-875, conglomeratic layers, monomict, with about 50% elongate subround limestone pebbles, aligned subparallel with bedding. Fault at 875. Graptolites, inarticulate brachiopods, trilobites (GSC locs. 53163, 870; 53162, 803-805, from a bioclastic bed; 53161, 785, 0"-6").	290	1,050
2	Covered interval, on opposite bank outcrops similar to unit 1 for much of the interval.	302	760
1	Limestone, very finely crystalline, dark grey, grey, dark bluish grey, weathers greyish yellow, grey, bluish grey, bedding 1 inch to 12 inches; minor limy argillite below 180, dark brown, dark grey, weathers greyish yellow, dark grey, poorly to moderately fissile; calcite veins and stringers; rare chert nodules and discontinuous chert layers at 389, 365, 138. Faults at 313, 268. Tight folds at		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	295, 274, 98, 19. Graptolites, inarticulate brachiopods, trilobites, sponge spicules (GSC locs. 53160, 256-258; 53159, 189 0"-4"; 53158, 139-144). Covered interval 117-122.	458	458

Section 20. TRAIL RIVER EAST SECTION

The upper part of the Road River Formation outcrops beneath disconformable Devonian rocks on Trail River, at 66°25'N 135°31'W. The base of the section is faulted against more strata of the Road River Formation (see Section 19). Measurement was by A. W. Norris in early July.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
12	Shale, siliceous, non-limy, black, weathers black with yellowish green stains. Contact with unit 11 an erosion surface 2 to 3 feet deep.	20	855
	Road River Formation, upper beds		
11	Shale, black, weathers light brownish grey, recessive; very minor thin limestone, slightly argillaceous and silty.	about 340	835
10	Limestone, finely crystalline to aphanitic, black, dark grey, weathers pale brown; shale interbeds, non-limy, black, weather black, recessive. Minor fault at 490. Graptolites (GSC loc. 54346, 439-445).	143	495
9	Shale, some limy, some non-limy, greenish grey, black, dark grey, recessive; limestone, mostly nodular, some argillaceous, some silty, finely crystalline, dark grey, black, weathers greenish grey, orange brown, thinly bedded. Clams, gastropods, echinoderm fragments (GSC locs. 54345, 244; 54344, 240).	100	352

Unit	Lithology	Thickness (feet) Unit	Total from Base
8	Shale, black, weathers grey; thin-bedded limestone, black, aphanitic, weathers orange-brown.	46	252
7	Shale, black, greenish grey, dark grey, weathers black, dark grey, rusty orange; pyrites in some beds. Graptolites (GSC loc. 54343, 142-159 loose).	64	206
6	Limestone, some beds nodular, some argillaceous, black, weathers dark grey, orange-brown, thinly bedded, some beds laminated on weathered surface; black limy shale interbeds. Fragmentary fossils (GSC loc. 54342, 99-105).	43	142
5	Limestone, very argillaceous, dark greenish grey, weathers light greenish grey, massive.	12	99
4	Shale, black, interbedded with dark greenish grey shale, recessive.	10	87
3	Shale, limy, dark grey, dark greenish grey, black, weathers dark grey, light grey, light orange-brown; limestone, mostly argillaceous, black, dark grey, dark greenish grey, weathers grey, light orange-brown, light brownish grey, thinly to medium bedded. Nodular limestone at 72; 1-inch bed of crinoidal limestone at 33; small limestone concretions at 13. Covered interval at 38-46.		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Brachiopods, Tentaculites (?) (GSC locs. 54340, 33; 54339, 24; 54338, 8-11 loose).	69	77
2	Dolomite, silty and argillaceous, fissile, weathers light orange-brown, resistant; a single bed.	2	8
1	Shale, limy with silty laminae, weathers banded light and dark grey, recessive. Fault present some 40 feet below zero footage, beds of Road River Formation outcrop on other side of fault.	6	6

Section 21. TETLIT CREEK SECTION

Excellent exposure of the Road River Formation is given by Tetlit Creek, the major tributary of Road River, but the lower part of the outcrops contain many faults and only the uppermost 2,979 feet can be measured. The top of the section is just below the mouth of the canyon at 66°43'N, 135°46'W, the base of the section is 1 1/2 miles upstream, within the canyon, at 66°43'N, 135°49'W, and the base of the formation is 2 1/2 miles farther upstream, above the canyon, at 66°43'N, 135°53'W. A minor fault separates the lowest beds of the Road River Formation from concordant recessive shale and siltstone that weather dark grey and brown. Devonian rocks overlie the uppermost Road River beds with angular unconformity. Beds of limestone conglomerate and breccia in the upper part of the section may be turbidity current deposits. Measurement was by staff in July when snow cover was lacking and the creek was low.

Jackson and Lenz measured this section and used it as the type section for the Road River Formation although the lower part of the formation is very poorly shown (1962, pp. 34-36). The present section relies on their published information for units 1 to 3, and for most of the graptolite zonation. Fossil collections made and identified by Jackson and Lenz are positioned within the present section and given the prefix JL.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian rocks		
30	Shale, siliceous, metallic dark bluish grey, weathers greyish black, grey, with brown stains; large limestone concretions, very finely to finely crystalline, grey, weathers grey, light grey, with reddish brown stains. Barren. Only basal beds examined. Angular unconformity at base of unit with erosion surface cut 1 foot deep in top beds of unit 29.		
	Road River Formation, upper member (Ordovician and Silurian)		
29	Shale, non-siliceous, some limy, greyish black, olive-black, brownish black,		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	weathers greyish black, dark grey, grey, with brown stains and dusting of off-white secondary mineral, fissility excellent to poor; rare siliceous argillite concretions at several horizons; rare argillaceous limestone, dark grey, weathers grey, bedding 1 inch to 12 inches; rare calcite stringers. At 2,966, 3-inch layer with rare argillaceous limestone concretions. Covered interval at 2,954-2,914. Graptolites (GSC locs. 53169, 2,912-2,914; 53170, 2,876 0"-2"; and JL 105-121, JL 164, JL 185).	207	2,979
28	Shale, slightly siliceous, dark grey, dark olive-grey, weathers dark grey, greyish black, with reddish brown stains and dusting of off-white secondary mineral, fissility very good to moderate. Covered interval at 2,697-2,705. Graptolites (JL 240, JL 250, JL 290-300).	75	2,772
27	Shale, some limy, greyish black, grey, weathers grey, greyish black, dark brownish grey, fissility good; rare argillaceous limestone concretions; rare thinly bedded limestone, slightly siliceous, very finely crystalline and partly bioclastic, grey, weathers grey, yellowish grey, bedding 1/4 to 1 inch, some beds laminated, some beds with small pyrite crystals. Corals, brachiopods, echinoderm fragments in the limestone beds, not in growth positions, some shells broken, others disarticulated,		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	probably transported (GSC locs. 53172, 2,616-2,623; 53171, 2,597).	100	2,697
26	Shaly argillite and shale, limy, dark grey, dull grey, weather dull grey, dark grey, light olive-grey, fissility poor to moderate; barren; very minor limestone, very finely crystalline, grey, weathers grey, yellowish grey, light olive-grey, yellowish orange, bedding 2 to 12 inches. At 2,596 0"-8", limestone breccia bed, weathers greyish yellow, about 60% matrix, very finely crystalline bluish grey limestone; sharpstones, small pebbles to small cobbles, poorly sorted, not graded, angular to subrounded, of brownish grey laminated siliceous limestone, yellowish orange siltstone, rare black chert, tabulate corals, brachiopods, echinoderm fragments. Fossils in limestone beds only (GSC loc. 53173, 2,498).	203	2,597
25	Shale and shaly argillite, non-limy, dark grey, weather dark grey; rare pyrites; very rare small argillite concretions, dark grey, weather yellowish orange. At 2,343, 2,278, 2,231, thin limestone, some argillaceous, very finely crystalline, dark grey, weathers light grey, yellowish grey. Covered interval at 2,278-2,300, minor faults at 2,390, 2,328 and 2,251. Graptolites, straight cephalopods (GSC loc. 53174, 2,319; JL 720).	171	2,394

Unit	Lithology	Thickness (feet) Unit	Total from Base
24	Limy argillite, dark grey, weathers dark grey, platy, poorly fissile. Limestone, some slightly siliceous, very finely crystalline, grey, dark grey, weathers yellowish grey, dark grey, bedding 3 inches to 2 feet; rare limestone conglomerate, subround to subangular coarse pebbles to fine sand. Unit slightly resistant; minor folding and contortion present.	44	2,223
23	Shale, non-limy, dark grey, weathers dark grey, greyish black, recessive, moderately fissile. Rare graptolites (JL 990).	19	2,179
22	Argillaceous limestone, shaly limestone, shaly limy argillite, grey, weather yellowish grey, grey, bedding 1 inch to 2 inches, some beds laminated; rare limestone breccia, as thin beds and lenses, most with 30 to 40% angular to subround coarse pebbles to fine sand, poorly sorted, not graded, of grey limestone, yellowish orange siltstone, black chert, dark grey shaly argillite, brachiopods, echinoderm fragments. Unit slightly resistant; contortions, crumples, and rolls within some beds, upper part of one bed subjacent to a limestone breccia shows slumping and rolls directed southeast.	105	2,160
21	Shaly argillite, limy, greyish black, weathers greyish black, bedding 1/8 to 1/2 inch where developed, poorly to moderately fissile when weathered; very minor limestone,		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	very finely crystalline, grey, dark grey, weathers dark yellowish orange, bedding 2 to 15 inches; commonly about 5% pyrite content. At 2,046, 1,934, thin limestone breccia-conglomerate beds, pebbles to sand, of yellowish orange siliceous limestone and greyish black chert. At 2,014-2,019 (1/2 per cent of rocks), 1,956-1,959 (10 per cent), subangular cobbles and small boulders of siliceous and very siliceous limestone, very finely crystalline, grey, weathers yellowish brown, scattered randomly through shaly argillite beds (no original lamination discernible) with disregard to bedding direction. Covered interval at 1,913-1,932. Contortions in laminated shaly argillite at 1,939. Barren.	142	2,055
20	Shale and shaly argillite, some limy, dark bluish grey, brownish black, weathers dark grey, greyish black, recessive; rare pyrite; rare argillaceous limestone concretions. At 1,883-1,885, limestone, very finely crystalline to aphanitic, grey, weathers grey, bedding 2 to 4 inches, lenticular. Graptolites (GSC loc. 53175, 1,888-1,891; JL 1,280).	49	1,913
19	Argillite, some limy, some slightly siliceous, shaly argillite, argillaceous limestone, shale, grey, dark grey, light grey, weather grey, dark grey, greyish yellow, yellowish brown, bedding 6 inches to 10 feet, some beds laminated, some weather flaggy;		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	rare pyrite; minor limestone, very finely crystalline, grey, bluish grey, weathers grey, light grey, yellowish grey, bedding 2 to 8 inches; rare thin limestone breccia-conglomerate beds, many lenticular, with fragments of yellowish orange-weathering siliceous dolomite and dark grey chert. At 1,799, dolomite, slightly siliceous, very finely crystalline, light grey, weathers dark yellowish orange, bedding 10 inches. At 1,592-1,599, lenticular greyish black impure chert, bedding 1 inch to 3 inches, amount to 8% of rock. At 1,614-1,619, strongly contorted shaly argillite between undistorted more resistant beds. Minor fault at 1,708. Rare graptolites, trilobites (GSC locs. 53176, 1,710 0"-1"; 53177, 1,687 0"-1"; JL 1,480, JL 1,505).	272	1,864
18	Shale, some limy, greyish black, grey, weathers grey, recessive; very rare thin limestone beds. At 1,585-1,589 greyish black chert beds, 3 to 6 inches thick, amount to 85% of rock. Unit poorly exposed, covered intervals at 1,519-1,527 and 1,511-1,516. Contortions at 1,567-1,569. Graptolites (GSC locs. 53178, 1,577 0"-1"; JL 1,600, JL 1,635, JL 1,640, JL 1,660).	83	1,592
17	Limestone, very finely crystalline, grey, weathers dull grey, bedding 1/4 inch to 8 inches. Shale, limy, brownish black, greyish black. Platy argillaceous limestone,		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	bedding 1/4 to 1/2 inch. Calcite veins. At 1,463, limestone conglomerate, 6 inches thick, with 40% subangular to subround small pebbles to coarse sand, monomict, of light grey, very finely crystalline limestone. Barren.	67	1,509
16	Shale, limy, dark brownish grey, brownish black, weathers greyish black, fissility poor to good; argillaceous limestone, dark grey, weathers grey, dark grey, platy, bedding 1/2 to 1 inch. At 1,440, limestone breccia conglomerate, 3 inches thick, includes yellowish orange weathering fragments. Covered interval at 1,402-1,416. Graptolites (GSC locs. 53179, 1,439 1/2;53180, 1,433-1,436; 53181, 1,396 0"-2"; JL 1,770, JL 1,780, JL 1,830, JL 1,840).	93	1,442
15	Shale, non-limy, brownish black, dark brownish grey, weathers greyish black, dark grey, recessive, very fissile; limestone, some beds slightly siliceous, some slightly argillaceous, very finely crystalline, grey, weathers grey, yellowish grey, bedding 1 inch to 12 inches; rare black chert nodules; minor impure greyish black bedded chert. At 1,269-1,272, coarsely crystalline limestone bed with small pebbles and layers of light grey chert that weather light bluish grey. Covered interval at 1,272-1,327. Graptolites (JL 1,845, JL 1,905, JL 1,940, JL 1,950).	95	1,349

Unit	Lithology	Thickness (feet) Unit	Total from Base
14	Chert, dark grey, greyish black, weathers dark grey, with reddish brown stains, bedding 1/2 inch to 3 inches. Shale, non-limy, greyish black, very fissile; minor limestone, slightly siliceous, finely crystalline, dark grey, weathers grey. Calcite stringers. Graptolites (JL 1,965-1,970, JL 1,975-1,985).	42	1,254
13	Dolomite, slightly siliceous, very finely crystalline, dull grey, weathers grey, medium bedded; rare pebbles of light grey weathering dolomite; 25% interbeds of greyish black chert. Barren.	9	1,212
12	Chert, grey, dark grey, weathers dark grey, dark bluish grey, greyish black, dark reddish brown, yellowish orange, resistant, bedding 1/4 inch to 24 inches, some beds lenticular, some beds with coarse vugs and drusy cavities, some beds with dolomite nodules; very minor siliceous shale, greyish black, weathers greyish black, poorly fissile; rare siliceous dolomite, finely crystalline, grey, weathers light grey, bedding 1 inch to 6 inches, commonly discontinuous within chert beds, one graded conglomeratic dolomite bed. Barren.	91	1,203
11	Shale, mostly siliceous, non-limy, dull grey, dark grey, weathers dark grey, fissility poor to moderate. Chert, grey, greyish black, weathers grey, reddish brown, bedding 1/4 inch to 3 inches.		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Rare dolomite, finely crystalline, grey, bedding 3 to 6 inches. Covered interval 1,029-1,046. Jackson and Lenz (1962, p. 35) suggest repetition of beds below this covered interval, by folding and/or faulting. Units 8 to 10 would be repetitions of units 12 to 13, but the lithologic similarity is insufficient to demonstrate this hypothesis. Graptolites (JL 2,065, JL 2,070, JL 2,075, JL 2,080, JL 2,090, JL 2,105, JL 2,117, JL 2,120, JL 2,135).	83	1,112
10	Chert, greyish black, weathers greyish black, grey, bedding 1/4 inch to 12 inches. Dolomite, mostly siliceous, very finely to finely crystalline, dull grey, grey, brownish grey, weathers dull grey, olive-grey, bedding 3 inches to 2 feet; chert layers and nodules; quartz veins, stringers, drusy cavities. Shale, non-limy, greyish black, brownish black. At 992, layer of concretions on top of a chert bed. At 991, impure chert beds contain subround pebbles and boulders of dolomite. At 879, dolomite breccia bed with chert and dolomite sharpstones. Covered interval at 1,006-1,012.	155	1,029
9	Dolomite breccia, resistant; matrix siliceous dolomite, very finely to finely crystalline, grey; sharpstones subangular to subround, small cobbles to coarse sand, of siliceous dolomite and chert. Bedding 3 1/2 feet, bed thickens to 6 feet in 400 yards along creek bank.	3 1/2	874

Unit	Lithology	Thickness (feet) Unit	Total from Base
8	Siliceous dolomite, dolomite breccia, chert as thin beds and as layers within dolomite beds, shale. Minor fault at 864. Graptolites (JL 2, 265).	26 1/2	870 1/2
7	Shale, non-limy, dark grey, weathers dull grey, yellowish grey; chert, greyish black, bedding 1/4 inch to 6 inches; minor dolomite, siliceous, finely crystalline, grey, dark grey, weathers light brownish grey, bedding 1 inch to 2 inches, some beds laminated, some beds with chert layers and nodules; very rare beds of chert conglomerate that grade upwards into chert. Graptolites (GSC loc. 53182, 842 0"-4"; JL 2, 315-2, 360).	60	844
6	Shale, non-limy, greyish black, dull dark grey, dark brownish grey, weathers greyish black, with dusting of off-white secondary mineral; very rare cherts, bedding 1/4 inch to 6 inches; a 2-inch dolomite bed at 760. Graptolites (JL 2, 451-2, 550).	91	784
5	Covered interval, minor fault visible on opposite (south) side of creek where Jackson and Lenz calculated the throw as 65 feet (1962, p. 35), on faunal evidence, but this figure requires a repeated outcrop of their unit 5 which was not seen. Measurement ignores throw of fault.	30	693
4	Chert, greyish black, bedding 1/2 inch to 6 inches. Shale, some siliceous, dark grey. Rare siliceous dolomite, finely crystalline, grey, weathers yellowish grey, bedding 1 inch to 6		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	inches. Graptolites (JL 2,565-2,585, JL 2,700, JL 2,715). Minor folds and contortions within unit. Base of unit a fault against unit 1. Jackson and Lenz found more beds (units 2 and 3) on the south side of the creek in front of this fault.	199	663
3	Shale, black, dolomitic, very fissile, with interbeds of limestone and chert. Graptolites (JL 2,740-2,800).	39	464
	Road River Formation, lower member, upper beds only		
2	Limestone, very argillaceous, dark grey, well bedded, flaggy; interbeds of grey finely crystalline dolomite and black limy shale. Graptolites (JL 2,850, JL 2,853, JL 2,875, JL 2,915). Unit 2 separated from unit 1 by a covered interval and the fault that outcrops on the north bank beneath unit 4.	175	425
1	Limestone, argillaceous, slightly siliceous, bluish grey, weathers light grey to brown, bedding good, 1 inch to 4 inches; conglomeratic bands; interbeds of dark grey limy shale, graptolitic. Local dolomitization against fault-plane. Graptolites (JL 20, JL 70, JL 130-145). Base of unit 1 close to another fault. Outcrop of rocks similar to those of units 1 and 2, but including more resistant limestone, siliceous limestone, and siliceous dolomite, continues for 2 1/2 miles farther upstream. All this outcrop is thought to		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	underlie unit 1 but the exposures contain many faults and do not allow useful measurement.	250	250

Section 22. ROCK RIVER SECTION

A thick section of the Road River Formation is exposed along Rock River in the west flank of the Richardson Mountains at 66°48'N, 136°05'-30'W. Faulting is less common than in the Tetlit Creek and Trail River sections and an estimate of the thickness of the lower member and knowledge of its faunas can be attained. The early onset of winter 1962 prevented study of these important outcrops by Operation Porcupine, and the following section is interpreted from a stratigraphic section measured by Imperial Oil Limited, 1961.

The top of the Road River Formation is picked beneath dark grey shale assigned to the Devonian but the actual boundary is hidden by a covered interval. Another covered interval separates the formation from shale, sandstone, and siltstone of assumed Cambrian age and similar to sub-Road River rocks exposed along Trail River. The total thickness of the formation is 10,280 feet, compared to the figure of 8,700 feet given by Jackson and Lenz (1962, p. 32) for the same section, this discrepancy may be primarily due to different interpretations of faulting within the section.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Road River Formation, upper member		
5	Shale, dark grey, weathers dark grey. Limestone and chert important as interbeds in the lower part of unit. Minor fault postulated at 10,050. Covered intervals at 11,000-11,070, 10,000-10,060, 9,890-9,960, 9,620-9720, 9,340-9,360, 8,890-8,920, 8,540-8,600 and 8,390-8,420. Graptolites.	2,820	11,070
4	Interbedded dark grey limy shale and argillaceous limestone, weather dark grey. Covered intervals at 8,140-8,220, 7,890-7,910, 7,750-7,760 and 7,090-7,110. Graptolites.	1,250	8,250

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Road River Formation, lower member		
3	Limestone, some argillaceous, dark grey, weathers dark grey and yellowish grey, minor dark grey shale; rare cherty beds; calcite veins present at several horizons. Covered intervals at 6,880-6,900, 6,620-6,650, 6,320-6,340, 6,100, 6,120, 5,520-5,550, 5,110-5,130, 3,810-3,820, 2,830-2,850, 2,570-2,600, 2,460-2,500, 2,140-2,170, 1,980-2,000, 1,950-1,970, 1,460-1,500 and 880-920. Rare graptolites.	6,210	7,000
	Sub-Road River Cambrian rocks		
2	Covered interval.	140	790
1	Shale, some slightly siliceous, dark grey, platy to fissile, some beds laminated; rare grey limestone concretions; greyish brown sandstone and siltstone. Covered intervals at 460-490, 380-410, 240-300 and 50-90. Rare sponge spicules.	650	650

Section 23. FISH CREEK SECTION

Light grey weathering Palaeozoic carbonates form a faulted dome at the headwaters of Fish Creek. The lower part of the section is best exposed in the canyon of an east-flowing major tributary creek, Vunta Creek (67°56'N, 136°33'-40'W), and Silurian, Devonian, Pennsylvanian, and Permian rocks outcrop along a steep, west-flowing minor creek (67°56'N, 136°31'-33'W) that enters Fish Creek a mile above Vunta Creek. Faulting is common and renders uncertain the true thicknesses of the units in the lower part of the section. The base of the section is the lowest bed exposed in the central part of the dome and may be within the Cambrian, and off to the north of the main dome, fault slices show Cambrian (?) sandstone, mudstone, and dolomite that are thought to underlie the carbonate sequence. The top of the section is within Middle Devonian carbonates. Measurement was by staff in late July with no snow cover and little water in the creeks but some covered intervals. The Fish Creek Section includes the type section of the Vunta Formation.

Unit	Lithology	Thickness (feet) Unit	Total from Base
	Middle Devonian rocks		
14	Limestone, very finely crystalline and subporcelaneous, some beds pelletoid, others with significant amounts of bioclastic debris, dark grey and grey, weathers light grey and grey, resistant, bedding mostly massive. Recessive breaks at 7,984 and 8,040-8,051. Fossil debris mostly crinoidal with corals, brachiopods, gastropods, clams, and trilobites (GSC locs. 53215, 8,097-8,099; 53214 from 10 feet within interval 8,024-8,074; 53213, 7,994-7,998).	196	8,126
13	Limestone, very finely crystalline to subporcelaneous, dark grey, weathers grey and light grey, resistant but less so than unit 14, bedding 1 foot to massive. Covered interval at 7,911-7,913. Corals		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	and brachiopods (GSC loc. 53212, 7,889-7,894).	56	7,930
	Rocks of Devonian and Late Silurian age		
12	Limestone, mostly somewhat siliceous, some dolomitic, very finely crystalline to finely crystalline, grey and dark grey, weathers grey, light grey, bluish grey, yellowish grey, with buff stains, bedding 1 foot to 8 feet; rare chert nodules at 7,389, weather dark brown. Siliceous limy dolomite, about 35% of rock, very finely crystalline, grey, and dark grey, weathers grey, light grey, and yellowish grey, with buff stains, bedding 6 inches to 5 feet; very rare dolomite-breccia beds. Lower part of unit more recessive and contains more dolomite. Covered intervals at 7,795-7,802, 7,716-7,718, 7,612-7,614, 7,570-7,574, 7,558-7,562, 7,545-7,548 and 7,442-7,444. Large ostracods in thin bedded limestone at 7,619-7,650, corals and brachiopods above (GSC locs. 53211, 7,733-7,734; 53210, 7,620). Contact gradational with unit 11.	625	7,874
11	Siliceous dolomite, finely crystalline to subporcelaneous, rare beds probably pelletoid, grey, dark grey, brownish grey, and light grey, weathers grey, yellowish grey, pale yellowish orange, dark grey, greyish orange, with buff stains, bedding 3 inches to 4 feet, good; minor limestones in the lowest 200 feet, very finely crystalline to subporcelaneous, dark grey and brownish grey, weathers grey, bedding 3 inches to		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	2 feet; dolomite breccia at 7,219. Covered intervals at 6,964-6,973, 6,832-6,869, 6,795-6,801, 6,729-6,733, 6,689-6,709, 6,679-6,687, 6,659-6,666, 6,375-6,414, 6,333-6,344 and 6,162-6,262, shallow erosion surfaces at 6,887 and 6,721, faults at 7,084 and 6,964. Barren except for fossil debris near base of unit. Contact gradational with unit 10.	1,187	7,249
10	Limestone, rarely bioclastic or biostromal, finely crystalline to aphanitic, dark grey, grey, and dark bluish grey, weathers grey with buff stains, recessive, bedding 1 inch to 24 inches, fairly good; 10 to 30% interbeds of siliceous limestone, very finely crystalline, grey, olive-grey, yellowish grey, weathers grey, grey-yellow, light orange-brown, with buff stains, bedding 3 to 18 inches; rare, very siliceous dolomite, aphanitic to very finely crystalline, light grey, weathers light greyish orange and yellowish orange, bedding 3 to 24 inches; rare chert nodules, weather grey-black. Covered intervals at 6,018-6,027, 5,932-5,951, 5,727-5,764, 5,716-5,722, 5,695-5,699, 5,667-5,673, 5,629-5,631, 5,608-5,611 and 5,541-5,563, fault at 5,822. Corals, brachiopods, and stromatoporoids (GSC locs. 53209, 6,051; 53208, 6,035; 53207, 6,030; 53206, 5,995; 53205, 5,852; 53204, 5,842; 53203, 5,780-5,783; 53202, 5,661; 53201, 5,588; 53200, 5,517-5,522).	545	6,062

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
9	Covered interval.	74	5,517
	Vunta Formation (Type section)		
8	Limestone, very finely crystalline to finely crystalline, with some aphanitic beds, grey and dark grey, weathers light grey, grey, with buff stains, moderately resistant, bedding 1 foot to 8 feet, commonly weathering platy or rubbly; nodular limestone conglomerate beds at 5,410-5,413, 5,337-5,345, 5,318-5,321. Covered intervals at 5,304-5,312, 5,275-5,287 and 5,260-5,267. Corals, brachiopods, and ostracods (GSC locs. 53199, 5,404-5,406; 53198, 5,398-5,406; 53193, 5,225-5,233; 54663, 5,365; 53197 and 53196, 5,317-5,327; 53194, 5,215-5,233). Contact gradational with unit 7.	228	5,443
7	Limestone, aphanitic with some very finely crystalline somewhat bioclastic limestone, light grey, grey, and dark grey, weathers light grey with buff stains, resistant, bedding 1 foot to 10 feet; a limestone conglomerate bed at 5,055-5,057; small calcite-filled vugs in the lower beds of the unit. Covered intervals at 5,105-5,107 and 5,068-5,097. Corals, including halysitids, and brachiopods (GSC locs. 53195, 5,105; 54661, 5,040; 54662, 4,965; 53192, 4,940). Fault at 4,918.	314	5,215
6	Limestone, aphanitic to very finely crystalline with bioclastic debris in most beds, dark bluish grey, grey, and grey-black, weathers		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	grey, light grey, with buff stains, relatively recessive, bedding 1 inch to 24 inches, weathering platy, 1/2 inch to 2 inches; minor pyrite in some beds; chert nodules in the upper part of the unit; a 2-inch bed of grey-black shale, moderately fissile, weathering dark brown, at 4,863. Corals, particularly halysitids and favositids, common in the upper beds (GSC locs. 53191, 4,869-4,901; 53190, 4,863; 53189, 4,844; 53188, 4,810-4,825).	91	4,901
5	Limestone, pelletoid, dark grey, light grey, grey, light olive-grey, and brownish grey, weathers light grey, resistant, bedding 3 feet to massive; aphanitic limestone with sparse bioclastic debris, dark grey, weathers light grey, bedding 6 inches to 5 feet, common in upper 200 feet; rare limestone, very finely crystalline to finely crystalline, dark grey, weathers light grey, bedding 1 foot to massive; very rare dolomites, including a sub-unit at 4,118-4,175, finely crystalline, light grey, weathers light grey and yellowish grey, bedding 10 feet to massive, commonly grading laterally into limestone. Covered intervals at 4,593-4,597, 3,985-4,017, 3,947-3,963, 3,871-3,876, 3,848-3,854, 3,825-3,833, 3,785-3,805, 3,648-3,659, 3,477-3,483, 2,960-3,005 and 2,930-2,952, faults at 4,620, 4,375, 4,235, 3,245 and 3,010. Fossils extremely rare, corals (GSC loc. 53187, 4,689-4,700), ostracods and trilobites (GSC locs. 53185, 3,887-3,893; 53186, 3,887-3,888), echinoderm columnals and		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	gastropods (GSC locs. 53184, 3,858-3,865; 53183, 3,277), fragmentary fossils (GSC loc. 54665, 2,665). Contact gradational with unit 4.	2,220	4,810
	Sub-Vunta rocks (? Cambrian)		
4	Dolomite breccia, 10 to 80% of beds weathers grey, brownish grey, and greyish orange, bedding 1 foot to 8 feet; matrix 30 to 40%, dolomite, very finely to coarsely crystalline, off-white, light grey, and light pinkish grey; sharpstones, polymict, poorly sorted, fine sand to small boulder sizes, of blue-grey, light grey, brownish grey, dark grey, and mottled blue-grey and light grey, siliceous dolomite and dolomite, and aphanitic to very finely crystalline, light grey limestone. Dolomite, siliceous and slightly siliceous, 20 to 80% of beds, finely to coarsely crystalline, white-grey, light grey, and blue-grey, weathers grey with buff stains, bedding 1 foot to massive, indistinct; locally 20 to 30% coarse off-white dolomite as vugs, veins, and stringers. Rare limestone, aphanitic and pelletoid, light grey, weathers light grey and grey with buff stains, bedding 4 feet to massive. Faults at 2,550 and 2,390. Barren.	365	2,590
3	Siliceous dolomite and dolomite, aphanitic to coarsely crystalline, mostly very finely and finely crystalline, grey, dark bluish grey, and dark grey, weathers grey, dark grey, yellowish grey, greyish orange, with buff stains,		

Unit		Thickness (feet) Unit	Total from Base
	bedding 3 inches to 4 feet; lamination in some beds; very rare layers of dolomite pebbles in lower part of unit; beds of dolomite breccia at 2,100 and 2,075; abundant stringers, vugs, and veins of dolomite, and rare veins of coarse light orange calcite; a few beds containing 15 to 40% vugs and stringers of coarse dolomite, irregularly aligned subparallel with bedding; a sub-unit at 1,765-1,815 of dolomite, medium to coarsely crystalline, very light grey, weathers grey, bedding 4 feet to massive. Shallow erosion surfaces at 1,671, 1,119, 1,111, 917, 914, 840 and 839. Covered intervals at 2,208-2,225, 2,007-2,012, 1,664-1,667, 1,563-1,570, 1,540-1,560, 1,423-1,448 and 875-892. Faults at 1,800, 1,740, 1,695, 1,640, 1,055, 1,005, and six within the interval 685-767. Barren. Faulted contact with unit 2.	1,555	2,225
2	Dolomite, coarsely to finely crystalline, grey, dark bluish grey, and light grey, weathers grey, light grey, light orange-grey, and brownish grey, somewhat recessive, bedding 2 feet to massive; dolomite vugs, veins, and stringers, a few beds contain up to 40% of coarse, greyish white calcite vugs and stringers irregularly aligned subparallel with bedding; lamination in a few beds and mottled weathered surfaces in others; very subordinate aphanitic limestone, some indistinctly pelletoid, dark grey,		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	bluish grey, and light olive grey, weathers light grey, bedding 2 feet to massive; up to 15% discrete medium to coarse rhombs of greyish white dolomite. Nine faults within the interval 235-599. Barren. Faulted contact with unit 1.	435	670
1	Limestone, aphanitic, mostly pelletoid, light olive-grey, light brownish grey, and dark grey, weathers light grey with buff stains, moderately resistant, bedding 2 feet to massive, poorly defined; stylolites common; calcite-filled vugs in lower beds. Four faults within the interval 0-235, limestones commonly dolomitized adjacent to faults.	235	235

Section 24. LOWER PORCUPINE RIVER SECTION

River bluffs form outcrops (67°34'N, 138°10'W) on the north bank of Porcupine River 7 miles above its junction with Driftwood River. The section was measured by staff and by tape in early August when low water allowed examination of beach outcrop below the bluffs. An impressive angular unconformity separates recessive Silurian and Devonian (?) rocks from two resistant, synclinal, Permian outcrops. The base of the section is the lowest bed presently exposed beneath the unconformity, the top of the Devonian (?) is the highest bed locally exposed beneath the unconformity, and the top of the section is against a fault beyond which outcrops are lacking.

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Permian rocks		
7	Chert-pebble conglomerate, weathers light yellowish orange, greyish orange, and light yellow-brown, resistant, bedding 1 foot to 5 feet, with 20 to 60%, fine to very coarse, rounded chert pebbles, grey, dark grey, light grey, grey-black, greyish orange, and off-white, weather brown and grey-black, in a siliceous sandstone matrix. Sandstone, siliceous, fine to very coarse, light grey and grey, mostly speckled, weathers light yellowish orange, light brown-grey, greyish orange, dark yellow-orange, and light grey, resistant, bedding 3 inches to 20 feet, mostly 1 foot to 8 feet, with some lamination and rare crosslamination, of angular to subround, mostly subangular, chert fragments and rare quartz sand; layers of chert pebbles within sandstone beds are common; minor green-grey shaly siltstone, weathers brown, near base of unit. Covered intervals (thicknesses estimates)		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	at 491-541, 584-609, 782-793 and 821-826. One per cent porosity as cavities in silica-filled vugs at 470, 5% intergranular porosity in sandstone at 779. Rare clams, brachiopods, and ? Spirophyton in basal beds (GSC loc. 53258 from 2 feet of beds away from main section but thought to correspond to part of the interval 475-500; 53259 float thought to be from basal part of unit 5).	508	967
6	Conglomerate, weathers light brown-grey, with subangular to rounded fine pebbles to coarse cobbles that include chert and tabulate corals, siliceous sandstone matrix amounting to 30% of rock at base and becoming preponderant above, bedding 2 to 6 inches at base, 2 to 3 feet above. Basal 10 inches clay, very light brown and off-white, weathers very light yellow-grey, very recessive, contains 5% of randomly scattered, rounded chert pebbles and angular plates of brown, weathered shale similar to that of unit 3. (GSC locs. 53257 derived cobble at 451; 53256 from 450 0-10 inches).	9	459
	Contact between units 6 and 5 an angular unconformity, discordance variable but 71° locally, unit 6 rests on units 1 and 4 in adjacent outcrops, shale of unit 1 weathered dull brown against the surface of contact.		

Unit	Lithology	Thickness (feet) Unit	Thickness (feet) Total from Base
	Devonian (?) rocks		
5	Chert, impure and argillitic, dull dark grey and grey-black, weathers dull dark grey, and grey with red-brown, yellow-brown, and light yellow stains, recessive, bedding 1/2 inch to 1 1/2 inches; 15% (outcropping) interbedded shale, non-limy, grey-black, weathers dark grey, recessive, poorly to moderately fissile, barren. Covered intervals at 362-368, 371-373, 374-377, 380-387, 424-448 and 449-450. Contact with unit 4 concordant, picked at first presence of chert. Higher beds referable to unit 5, outcrop to the east beyond the Permian outcrops.	103	450
4	Shale, limy, non-siliceous, grey-black and dark grey, weathers grey-black and black with off-white mineral dusting, recessive, fissility poor to excellent (paper-shale); rare limy argillite, poorly fissile, dark grey, weathers dark grey, bedding 1/2 inch to 2 inches. Covered intervals at 262-277 and 287-291. Tentaculites (?), brachiopods, and straight cephalopods (GSC locs. 53254, 291-321; 53255, 296-306; 53253, 257-262). Unit is very similar to unit 2.	90	347
3	Covered interval.	10	257
	Road River Formation (Silurian)		
2	Shale, limy, grey-black, weathers grey-black with off-white mineral		

Unit	Lithology	Thickness (feet) Unit	Total from Base
	dusting, very recessive, fissility poor to excellent (paper-shale); with two thin beds (1/2 and 1 inch) of limy chert at 237. Covered interval at 169-218. Tentaculites (?), Monograptus (GSC locs. 53252, 238 0-2 inches; 53251, 232-234; 53250, 219-223).	78	247
1	Shale, non-limy, grey-black, weathers dark grey, recessive, fissility moderate to good; about 15% cherty argillite at 11-20, and 8-inch bed of soft, non-fissile, black argillite at 87. Covered intervals at 20-27, 35-44, 57-63, 127-138, 149-150 and 157-162. Monograptus common (GSC locs. 53249, 126-127; 53248, 107-108; 53247, 69-70; 53246, 65-66; 53245, 53-54; 53244, 48-49; 53243, 34-35; 53242, 11-15; 53241, 2-7).	169	169

APPENDIX II. FAUNAL LISTS[1]

Section 1	Cranswick River Headwaters	GSC Loc. No.
439-445 ft	indeterminable ostracods not diagnostic	54446
Section 2	**Canyon Ranges**	
2,391-2,393 ft	stromatoporoids cystiphyllid and other solitary corals *Favosites* sp. Silurian or Devonian, probably Silurian	53152
2,279-2,283 ft	stromatoporoids *Favosites* sp. *Cystihalysites* sp. Silurian	53150
1,769-1,775 ft	echinoderm fragments straight cephalopod bryozoa spp. trilobite *Streptelasma* sp. *Palaeophyllum* sp. *Palaeophyllum* cf. *P. pasense* Stearn *Catenipora* sp. *Palaeofavosites* spp. *Dinorthis columbia* Wilson Upper Ordovician	53157

[1] The *Monograptus* sp. E cited in these faunal lists has recently been named *Monograptus yukonensis* by Jackson and Lenz (1963, Palaeontology, vol. 6, pp. 751-753). No unequivocal dating can be given for *M. yukonensis* but Jackson and Lenz suggest possible correlation either with the post-Ludlow zone of *M. hercynicus*, or with the Middle Ludlow zone of *M. ultimus*, both of central Europe.

Johnson and Boucot are cited as suggesting probably early Gedinnian age for brachiopods from carbonate rocks at Royal Creek. These brachiopods were collected from beds that stratigraphically underlie the type locality of *M. yukonensis*. A couple of miles northwest of Royal Creek, what appears to be the same shelly fauna is found in strata interbedded with shales that carry *M. yukonensis* (Lenz 1964, personal communication).

Section 2 (cont'd)

932 ft 0-3 in	echinoderm fragments Xenostegium sp. Lower Ordovician, lower Canadian	53156

Section 3	Trevor Range	
941-950 ft	streptelasmid coral probably Ordovician or Silurian	50574
463-482 ft	solitary and favositid corals small brachiopods ? Eospirifer sp. Silurian	50569
445-451 ft	solitary coral Cystihalysites or Halysites sp. Silurian	50576
420 ft	echinoderm fragments small gastropods orthid brachiopod ? Glassia sp. probably Silurian	50570
15-33 ft	Favosites sp. Cystihalysites or Halysites sp. small brachiopods Silurian	50566

Section 4	Knorr Range	
372-390 ft	cf. Styliolina sp. solitary coral rhynchonellid brachiopod ? Atrypa sp. cf. Monograptus sp. Silurian	50439
353-360 ft	cf. Styliolina sp. cf. Tentaculites sp. Monograptus sp. Silurian	50441

Section 5	South Illtyd Range	
2,554 ft	Leperditia sp. Silurian or Devonian; identified by M. J. Copeland	53118
2,412 ft	Leperditia cf. L. scalaris Jones leperdetiid ostracod probably Upper Silurian; identified by Copeland	53116
2,305-2,306 ft	Leperditia cf. L. scalaris Jones cf. Howellella sp. Conchidium alaskense Kirk & Amsden Upper Silurian; ostracods identified by Copeland	53115
1,400-1,403 ft	ostracods, indeterminable stromatoporoid favositid corals brachiopods cf. Glassia sp. illaenid trilobite Scutellum sp. Encrinurus cf. E. princeps Poulsen Aristoharpes sp. Lower Silurian, middle or upper Llandovery; ostracods identified by Copeland	53109
951-967 ft	echinoderm fragments gastropod solitary, favositid, and ? heliolitid corals Favosites sp. illaenid trilobite Upper Ordovician or Silurian, probably Lower Silurian	53104
Section 6	Royal Creek	
2,007-2,012 ft	cf. Styliolina sp. dendroid graptolites Monograptus sp. Silurian	53087

Section 6 (cont'd)

1,906-1,911 ft	cf. Tentaculites sp. cf. Styliolina sp. brachiopod dendroid graptolites Monograptus aff. M. ramstalensis Jaeger Upper Silurian, middle or upper Ludlow	53084
1,813-1,814 ft	cf. Tentaculites sp. cf. Styliolina sp. dendroid graptolite Monograptus aff. M. sp. E of Jackson & Lenz Upper Silurian, middle or upper Ludlow	53082
1,165-1,175 ft	stromatoporoid solitary and favositid corals Calapoecia sp. Catenipora sp. probably Upper Ordovician	53080
1,016 ft	leperditiid ostracod not diagnostic, identified by Copeland	53079

Section 7 Prongs Creek

649-702 ft	cf. Tentaculites sp. cf. Styliolina sp. dendroid graptolite Monograptus sp. Silurian	53137
278-280 ft	Monograptus sp. Monograptus bohemicus (Barrande) Upper Silurian, lower Ludlow, Monograptus nilssoni fauna	53143
223 ft	echinoderm fragments solitary coral brachiopods Conchidium cf. C. alaskense Kirk & Amsden trilobite fragment Upper Silurian	53145

Section 7 (cont'd)

45-60 ft	brachiopods Monograptus spp. Monograptus cf. M. spiralis (Geinitz) Monograptus aff. Diversograptus runcinatus (Lapworth) Retiolites sp. Lower Silurian, upper Llandovery, probably Monograptus spiralis fauna	53130
20-26 ft	inarticulate brachiopods Monograptus spp. Monograptus aff. M. gemmatus (Barrande) Monograptus cf. M. turriculatus (Barrande) cf. Petalograptus sp. Lower Silurian, upper Llandovery, Monograptus turriculatus fauna	53127
10-18 ft	straight cephalopod gastropod brachiopods Atrypa cf. A. gabrielsi Norford Glassia variabilis Whiteaves Fardenia sp. Fardenia cf. F. ellipsoides Stearn Aulacopleura socialis Poulsen Encrinurus princeps Poulsen Leonaspis semiglabra Poulsen Scutellum borealis (Poulsen) Lower Silurian, lower upper, or middle, Llandovery	53126
4-10 ft	straight cephalopod brachiopods Atrypa cf. A. gabrielsi Norford Glassia variabilis Whiteaves Fardenia sp Fardenia cf. F. ellipsoides Stearn Aulacopleura socialis Poulsen Encrinurus princeps Poulsen Leonaspis semiglabra Poulsen Scutellum borealis (Poulsen) Lower Silurian, lower upper, or middle, Llandovery	53124

Section 7 (cont'd)

25 ft of strata immediately below zero	straight cephalopod stromatoporoids spp. Streptelasma sp. Bighornia sp. Palaeophyllum spp. Palaeophyllum cf. P. halysitoides (Troedsson) Calapoecia sp. Sarcinula sp. Catenipora sp. Catenipora cf. C. rubra Sinclair & Bolton Palaeofavosites spp. Upper Ordovician	53121

Section 8	Clear Creek	
493 ft	stromatoporoid cf. Aulacera sp. Catenipora cf. C. rubra Sinclair & Bolton Palaeofavosites spp. Upper Ordovician	50501
478 ft	cf. Aulacera sp. cf. Maclurites sp. cf. Streptelasma sp. Catenipora cf. C. rubra Sinclair & Bolton Palaeofavosites sp. Upper Ordovician	50499
466-478 ft	Parafavosites sp. Upper Ordovician to Silurian	50502
221 ft	small gastropod brachiopod cf. Eoleperditia sp. possibly Middle Ordovician ostracod identified by Copeland	50498

Section 9	Pat Lake North	
1,278-1,306 ft	brachiopods Leptaena sp. Streptelasma sp. aff. Calapoecia sp.	53078

Section 9 (cont'd)

	Palaeofavosites sp. Upper Ordovician or Silurian, probably Upper Ordovician	
1,118-1,126 ft	straight cephalopod Climacograptus sp. Dicellograptus sp. Ordovician, Caradoc or Ashgill	53077
212-225 ft	diplograptid graptolite Climacograptus sp. Dicellograptus sp. Cnemidopyge sp. Ordovician, probably Caradoc	53072
0-2 ft	Climacograptus sp. Dicellograptus sp. Dicranograptus sp. Ordovician, Caradoc	53071

Section 10 Blackstone River North

2,043-2,053 ft	stromatoporoid Streptelasma sp. Grewingkia sp. Favistina sp. Palaeophyllum sp. Catenipora aff. C. rubra Sinclair & Bolton ? Palaeofavosites sp. Parafavosites sp. Rhynchotrema sp. Upper Ordovician	50555

Section 11 Blackstone River

1,515-1,521 ft	diplograptid graptolites Ordovician or Lower Silurian	53070
1,453-1,457 ft	trilobite ? Orthograptus sp. ? Climacograptus sp. Dicellograptus complanatus ornatus Elles & Wood Ordovician, Ashgill	53068

Section 11 (cont'd)

933 ft 0-3 in	diplograptid graptolite Climacograptus sp. Dicellograptus sp. Dicranograptus sp. Ordovician, Caradoc	53060
254-260 ft	trilobites diplograptid graptolites Clonograptus sp. Ordovician, Arenig	53053
148-162 ft	inarticulate brachiopods trilobites Didymograptus cf. D. extensus (Hall) ? Isograptus sp. Tetragraptus cf. T. quadribrachiatus (Hall) Ordovician, Arenig	53050

Section 12 — Ogilvie River

	crinoid columnals (two axial canals) stromatoporoid rugose corals Hexagonaria sp. cf. Phillipsastrea sp. Favosites sp. Alveolites sp. Middle Devonian, Eifelian, identified by A. W. Norris	53264
	brachiopods trilobite Catenipora sp. diplograptid graptolites Middle Ordovician to Lower Silurian, probably Upper Ordovician	53267

Section 13 — Nahoni Range

78 ft	Monograptus spp. Monograptus aff. M. bohemicus (Barrande) Silurian, probably lower Ludlow	54194

Section 13 (cont'd)

36 ft	Monograptus spp. Monograptus cf. M. dubius (Suess) Monograptus bohemicus (Barrande) Upper Silurian, lower Ludlow, Monograptus nilssoni fauna	54188

Section 14	Monster River Headwaters	
1,961-1,971 ft	Monograptus sp. Monograptus cf. M. crinitus (Wood) Monograptus bohemicus (Barrande) Linograptus phillipsi multiramosus Decker Upper Silurian, lower Ludlow, Monograptus nilssoni fauna	53274
1,620-1,622 ft	cf. Climacograptus sp. Dicellograptus spp. Dicranograptus sp. ? Glossograptus sp. ? Nemagraptus sp. ? Orthograptus sp. Ordovician, Caradoc	53270
400 ft	echinoderm fragments Cambrian or younger	53394

Section 15	Tatonduk River Headwaters	
1,595-1,598 ft	straight cephalopod sponge spicules solitary coral cf. Calapoecia sp. cf. "Bythocypris" sp. brachiopods cf. Robergia sp. Glyptograptus sp. Ordovician, Llandeilo or Caradoc, ostracod identified by Copeland	53261 and 53262

Section 16	Mount Burgess	
3,282-3,296 ft	inarticulate and orthid brachiopods "Primitia" sp. cheirurid trilobite ? Lonchodomas sp. Cnemidopyge sp. Ordovician, most probably Caradoc	54290
Section 17	Keele Range	
	straight cephalopod stromatoporoids rugose corals spp. Tryplasma sp. cf. Disphyllum sp. Cystiphyllum sp. Parafavosites sp. Favosites sp. ? Parastriatopora sp. Atrypella cf. A. scheii (Holtedahl) Upper Silurian	53286
Section 18	Canyon Creek	
3,297 ft	Cyrtograptus sp. Monograptus spp. Retiolites sp. Middle Silurian	53046
3,273-3,274 ft	Monograptus sp. Monograptus aff. M. priodon (Bronn) Monograptus spiralis (Geinitz) Retiolites sp. Lower Silurian, upper Llandovery, Monograptus spiralis fauna	53044
3,190-3,192 ft	Diversograptus sp. Monograptus spp. Lower Silurian	53043
3,180 ft 0-6 in	dendroid graptolite Monograptus spp. Monograptus spiralis (Geinitz) Retiolites sp. Lower Silurian, upper Llandovery, probably Monograptus spiralis fauna	53042

Section 18 (cont'd)

3,095 ft 0-8 in	Monograptus sp. Monograptus cf. M. spiralis (Geinitz) Retiolites sp. Silurian, upper Llandovery	53041
1,054 ft 8-9 in	dendroid graptolites Clonograptus sp. ? Didymograptus sp. Tetragraptus cf. T. quadribrachiatus (Hall) Ordovician, Arenig	53034
862 ft	inarticulate brachiopods Clonograptus sp. Ordovician, Tremadoc or Arenig	53032
503-504 ft	dendroid graptolites ? Dictyonema sp. Upper Cambrian or higher	53031

Section 19 Trail River

1,087 ft 0-1 in	inarticulate brachiopod trilobites cf. Minicephalus sp. Tricrepicephalus sp. Upper Cambrian, Dresbach, probably Crepicephalus fauna	53165
1,066 ft	? sponge spicules inarticulate brachiopod dendroid graptolite Callograptus sp. Dendrograptus sp. probably Upper Cambrian	53164
803-805 ft	inarticulate brachiopod trilobite cf. Tricrepicephalus sp. Upper Cambrian, probably Dresbach	53162
785 ft 0-6 in	inarticulate brachiopods Dendrograptus sp probably Upper Cambrian	53161

Section 19 (cont'd)

189 ft 0-4 in	Dendrograptus sp. probably Upper Cambrian	53159

Section 20 Trail River East

439-445 ft	Monograptus sp. Silurian, probably Ludlow	54346

Section 21 Tetlit Creek

2,876 ft 0-2 in	cf. Styliolina sp. Monograptus sp. E. of Jackson & Lenz Upper Silurian, middle or upper Ludlow	53170
1,888-1,891 ft	Monograptus sp. Monograptus bohemicus (Barrande) Monograptus cf. M. uncinatus orbatus Wood Linograptus phillipsi multiramosus (Decker) Upper Silurian, lower Ludlow, Monograptus nilssoni fauna	53175
1,577 ft 0-1 in	inarticulate brachiopods Monograptus aff. M. dubius (Suess) Monograptus cf. M. flemingi (Salter) Middle Silurian	53178
1,439 ft 6 in	Monograptus spp. Monograptus aff. M. barrandei (Suess) Monograptus cf. M. spiralis (Geinitz) Monograptus cf. M. priodon (Bronn) Retiolites sp. Lower Silurian, upper Llandovery, Monograptus spiralis fauna	53179
1,396 ft 0-2 in	Monograptus spp. Monograptus aff. M. nudus Lapworth Monograptus spiralis (Geinitz) Monograptus cf. M. priodon (Bronn) Retiolites cf. R. geinitzianus angustidens Elles & Wood Lower Silurian, upper Llandovery, Monograptus spiralis fauna	53181

Section 21 (cont'd)

842 ft 0-4 in	diplograptid graptolites cf. Didymograptus sp. Glossograptus sp. Ordovician, Llanvirn or Llandeilo	53180

Section 23 Fish Creek

8,024-8,074 ft	crinoid columnals (some with two axial canals) pentamerid brachiopod Favosites sp. cf. Hexagonaria sp. Middle Devonian, Eifelian, identified by Norris	53214
6,051 ft	Atrypella cf. A. scheii (Holtedahl) Upper Silurian, identified by Norris	53209
6,030 ft	Atrypella phoca ? (Salter) ? Harpidium sp. Upper Silurian, identified by Norris	53207
5,588 ft	cf. Atrypella sp. probably Upper Silurian identified by Norris	53201
5,404-5,406 ft	leperditiid ostracod cf. Leperditia sp. probably Silurian or Devonian; identified by Copeland	53199
5,398-5,406 ft	? stromatoporoid Favosites spp. rhynchonellid brachiopod Silurian	53198
5,317-5,327 ft	Leperditia cf. L. scalaris Jones leperditiid ostracod solitary coral Favosites spp. rhynchonellid brachiopod probably Upper Silurian; ostracods identified by Copeland	53197 and 53196

Section 23 (cont'd)

5,215-5,233 ft	Leperditia hisingeri Schmidt Leperditia cf. L. phaseola (Hisinger) cf. Dihogmochilina sp. stromatoporoid streptelasmatinid coral Favosites sp. Cystihalysites sp. rhynchonellid brachiopod Silurian, upper Llandovery or Wenlock; ostracods identified by Copeland	53193 and 53194
4,940 ft	echinoderm, trilobite, and brachiopod fragments solitary coral Catenipora sp. ? Lissocoelina sp. Silurian	53192
4,869-4,901 ft	echinoderm and microfossil debris solitary, favositid, and halysitid corals Halysites sp. Cystihalysites sp. Silurian	53191
4,689-4,700 ft	large planispiral gastropod stromatoporoid solitary coral Favosites sp. Catenipora sp. Silurian	53187
3,887-3,893 ft	cf. Heterochilina sp. Illaenus sp. Bathyurellus (?) aff. B. (?) affinis Poulsen Ordovician, probably Chazy or upper Canadian; ostracods identified by Copeland	53186
3,858-3,865 ft	small gastropods Phanerozoic	53184
3,277 ft	gastropods Phanerozoic	53183

Section 23 (cont'd)

2,665 ft	fragmentary fossils not diagnostic	54665

Section 24	Lower Porcupine River	
	pelecypod cf. Bothrophyllum sp. productid brachiopod Muirwoodia sp. Spiriferella cf. S. saranae (de Verneuil) Permian; identified by E. W. Bamber	53259
	"Spirophyton" (?) sp. Archimedes (?) sp. rhynchonellid brachiopods Waagenoconcha sp. Linoproductus (?) sp. Spiriferella cf. S. saranae (de Verneuil) Permian; identified by Bamber	53258
219-223 ft	straight cephalopod cf. Tentaculites sp. cf. Styliolina sp. Monograptus aff. M. sp. E of Jackson & Lenz Upper Silurian, probably middle or upper Ludlow	53250
2-7 ft	Monograptus spp. Monograptus aff. M. formosus Bouček Upper Silurian, probably middle Ludlow	53241

Spot Localities

68°24'N, 138°07'W approximately	Barn Mountains; faulted inlier, from 6 in of beds, Road River Fm. Monograptus aff. M. priodon (Bronn) Silurian, upper Llandovery or Wenlock	53225

Spot Localities (cont'd)

65°02'N, 134°46'W collected by U. Upitis	Near Wind River; talus from carbonate rocks of Illtyd Range ? Favosites sp. Multisolenia sp. ?Pentamerus sp. Silurian	53294
65°22'N, 135°20'W collected by R.M. Procter	Illtyd Range; carbonate rocks. straight and coiled cephalopods gastropods and clam Gibberella sp. illaenid trilobite ? Dienstina sp. Silurian, Llandovery or lower Wenlock; ostracod identified by Copeland	54058
65°18'N, 135°44'W collected by A.W. Norris	Lake Creek Section, northern Wernecke Mountains; 79-129 ft below top of Upper Ordovician carbonate unit. algal structures straight cephalopod Bighornia sp. Palaeophyllum cf. P. pasense Stearn Sarcinula sp. Palaeofavosites sp. Upper Ordovician	50492
65°22'N, 135°20'W collected by R.M. Procter	Illtyd Range; carbonate rocks. gastropods ostracod, indeterminable Eoleperditia (?) sp. brachiopod trilobites ?Tolstochichaspis sp. Ordovician, Lower or Middle; ostracods identified by Copeland	54057

Spot Localities (cont'd)

66°38'N, 140°32'W approximately, collected by R. M. Procter	Keele Range; carbonate rocks. ostracods inarticulate and orthid brachiopods pliomerid, asaphid, and other trilobites cf. Cybeloides sp. cf. Raphiophorous sp. Shumardia sp. Trinodus sp. Phyllograptus sp. upper Lower Ordovician	54076
65°02'N, 137°12'W collected by L. H. Green	Near Hart River, Ogilvie Mountains; carbonate rocks. echinoderm fragments brachiopods pliomerid trilobite Kainella flagricauda (White) Leiostegium manitouensis Walcott cf. Parapilekia sp. Lower Ordovician, lower Canadian, Leiostegium-Kainella fauna	47050
66°28'N, 135°36'W	Tributary to Trail River, Richardson Mountains; Road River Formation, 300 ft above base. inarticulate brachiopod ? Dendrograptus sp. ? Desmograptus sp. probably Upper Cambrian	53168