

Appendix B

Fossil reports that include the samples
presented in this report

REPORT ON FOSSILS COLLECTED BY YUKON GEOLOGICAL SURVEY DURING 2019 SUMMER FIELD SEASON

Prepared by Robert B. Blodgett, Consulting Geologist/Paleontologist, 2821 Kingfisher Drive, Anchorage, Alaska 99502, USA [email: RobertBlodgett@gmail.com; ph. 907-903-9222]

Report Date: March 24, 2020

The report below presents my and Mike Melchin's analysis of the fossils gathered in 2019 by the Yukon Geological Survey for the following 21 localities: 19TA006, 19TA091-3, 19RC048-1, 19RC085-1, 19RC089-1, 19RC106-2, 19RC113-1, 19RC140-1, 19RC149-1, 19RC158-1, 19RC225-2, 19RC242-1, 19RC253-1, 19RC255-1, 19RC257-1, 19RC285-1, 19RC289-1, 19-TF-12@470.3 m, 19-TF-13, 19-TF-15@70.3 m, and 19-TF-15@470.3 m.

I take full responsibility for identifications of the invertebrate marine shelly fauna, with minor assistance on several faunal groups by Yury Zaika (Minsk, Belarus for tabulate corals), (Dmitry Plax, Minsk, Belarus for possible fossil fish), Valeryi Baranov (Yakutsk, Siberia, Russia for a Devonian brachiopod), David M. Rohr (Alpine, Texas on gastropods), and Jin Jisuo (London, Ontario on Ordovician brachiopods). This year's samples included a number of Ordovician graptolites, and in that my experience with graptolites is mostly limited to the Silurian and Lower Devonian forms, I farmed these out to Michael J. Melchin (St. Francis Xavier University, Antigonish, Nova Scotia), who is highly specialized in Ordovician graptolites of western and Arctic Canada.

Three geologists from the Yukon Geological Survey submitted samples reported here. They are: Rosie Cobbett (field initials RC); Tiffani Fraser (field initials TF); and Tyler Ambrose (field initials TA).

TYLER AMBROSE SAMPLES

19TA006

Stratigraphic Unit: Bouvette

Lat. 64.2650, Long. -133.6365

Probable age from YGS spreadsheet: Silurian-Devonian

Notes from YGS spreadsheet: Light gray weathering, med. gray fresh dolostone. Includes 19RC079 from same locality.

Taxa: large solitary indet. coral, tabulate coral identified by Yury Zaika as resembling *Favosites (Favosites) gothlandicus moyeroensis* Sokolov et Tesakov, 1963 (sensu lato, in his understanding of this species), the gastropod *Euomphalopterus* or *Bathmopterus*.

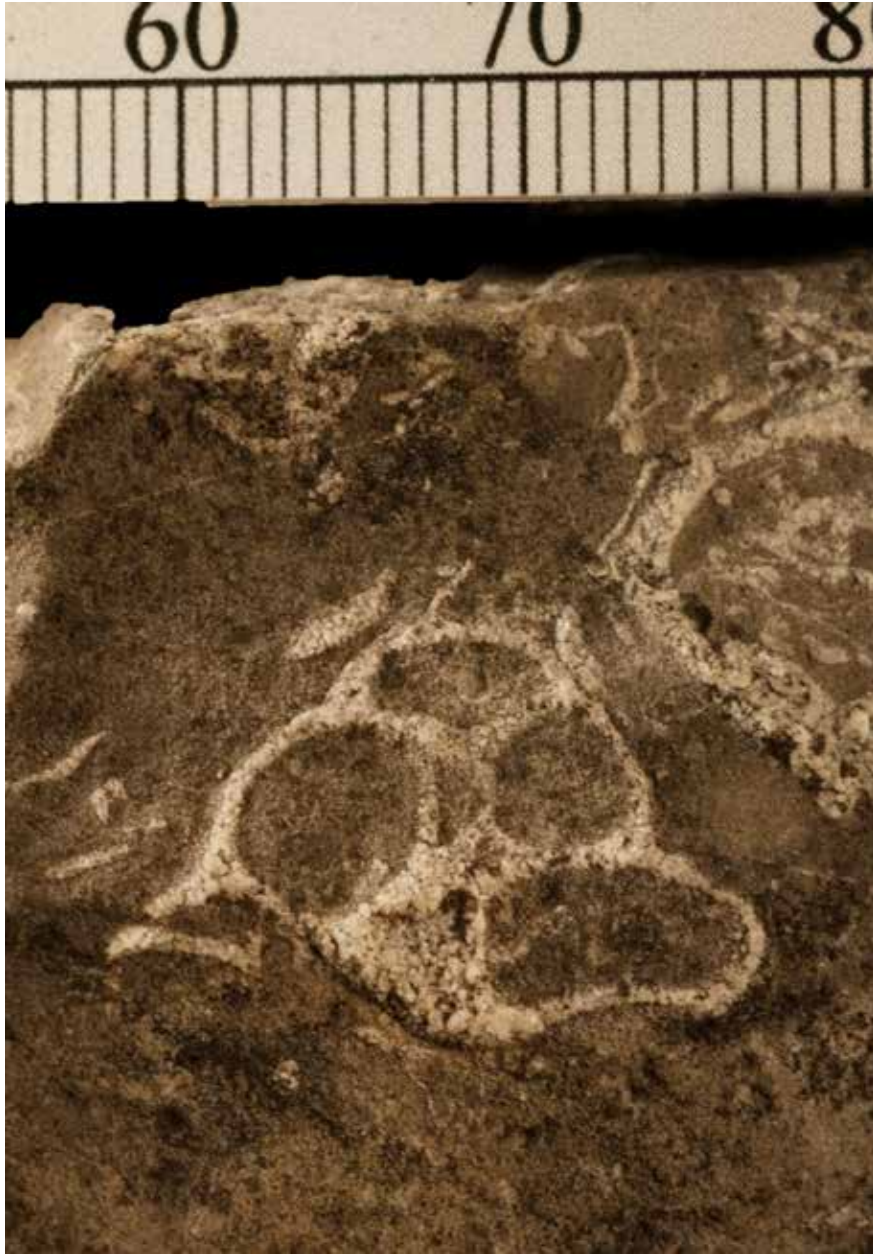
Age: **Silurian**, typically Telychian (Upper Llandovery) and Wenlockian according to the tabulate coral, the gastropod suggests a longer ranging Silurian age (as high as Ludlow).

Comments (from Y. Zaika): The images you sent are very interesting, although something is not clearly visible due to rough surfaces. Anywhay, I am probably able to discern some main determinative details. This specimen is very much resembles to me the widespread Eurasian Arctic tabulate coral *Favosites (Favosites) gothlandicus moyeroensis* Sokolov et Tesakov, 1963 (sensu lato, in my understanding of this species), typically Telychian (Upper Llandovery) and Wenlockian. So, if it were material from somewhere in Siberia or Taimyr, I would have tentatively defined it that way. However, a place for doubt remains, since not all the details can be considered. (Yury Zaika, Minsk, Belarus, written commun., Dec. 4, 2019)

Recommendations for future work: Get more fauna if future work allows, especially collect for more diversity. I would love to see more specimens of the gastropods.



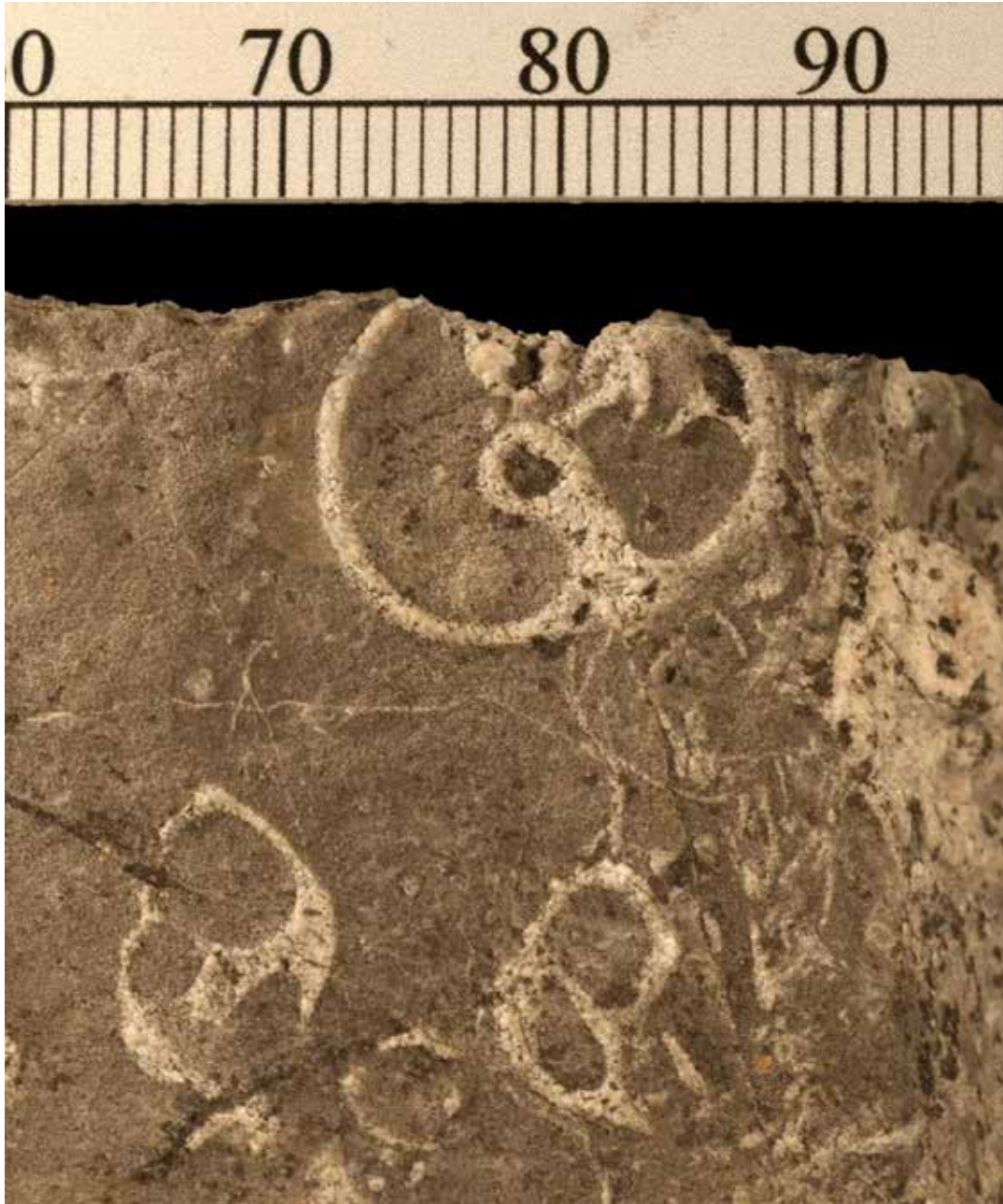
Tabulate coral close to *Favosites (Favosites) gothlandicus moyeroensis* Sokolov et Tesakov, 1963. Locality 19TA006, scale bar in mm



The gastropod genus *Euomphaloterus* or related *Bathmopterus* in cross-section. Scale bar in mm. Locality 19TA006.



The gastropod genus *Euomphaloterus* or related *Bathmopterus* in cross-section. Scale bar in mm. Locality 19TA006.



Additional gastropods in cross-section. Probably *Euomphalopterus* or *Bathmopterus*. Scale bar in mm. Locality 19TA006.



Indeterminate solitary rugose coral in side view (note septa), locality 19TA006. Scale in mm.

19TA091-3 (=19RC079)

Stratigraphic Unit: Bouvette

Lat. 64.2300, Long. -133.8875

Probable age from YGS spreadsheet: Silurian

Notes: Volcanic detritus separating upper-lower Bouvette. Fossiliferous, sandstone to wackestone

Taxa: "*Dalmanella*" sp. (brachiopod), dalmanelloid brachiopod probably *Onniella*, undetermined solitary rugose corals

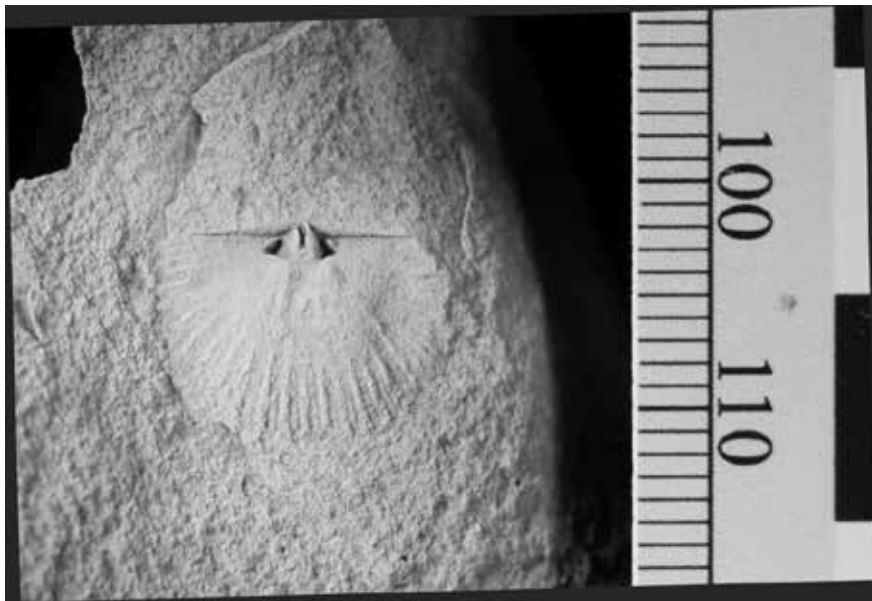
Age: **Middle Ordovician (Llanvirn)-lower Silurian (Llandovery)**, range for *Onniella*

Comments: The relative ages between samples 91TA091-3 and 91TA006 indicate that 91TA091-3 is probably older in age than 91TA006.

Recommendations for future work: collect more fauna, especially for brachiopods



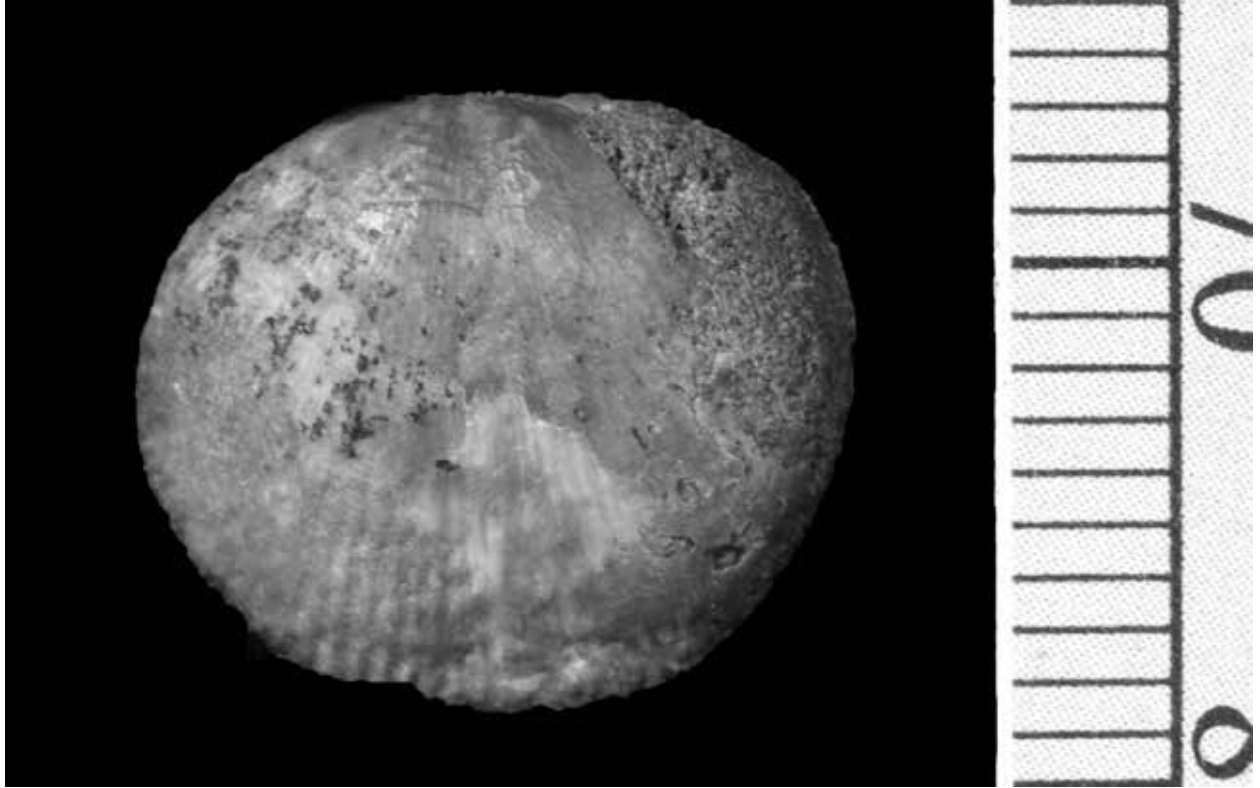
Dalmanelloid brachiopod, probably *Onniella* sp., locality 19TA091-3, scale bar in mm. Specimen etched in HCL and then coated with ammonium chloride.



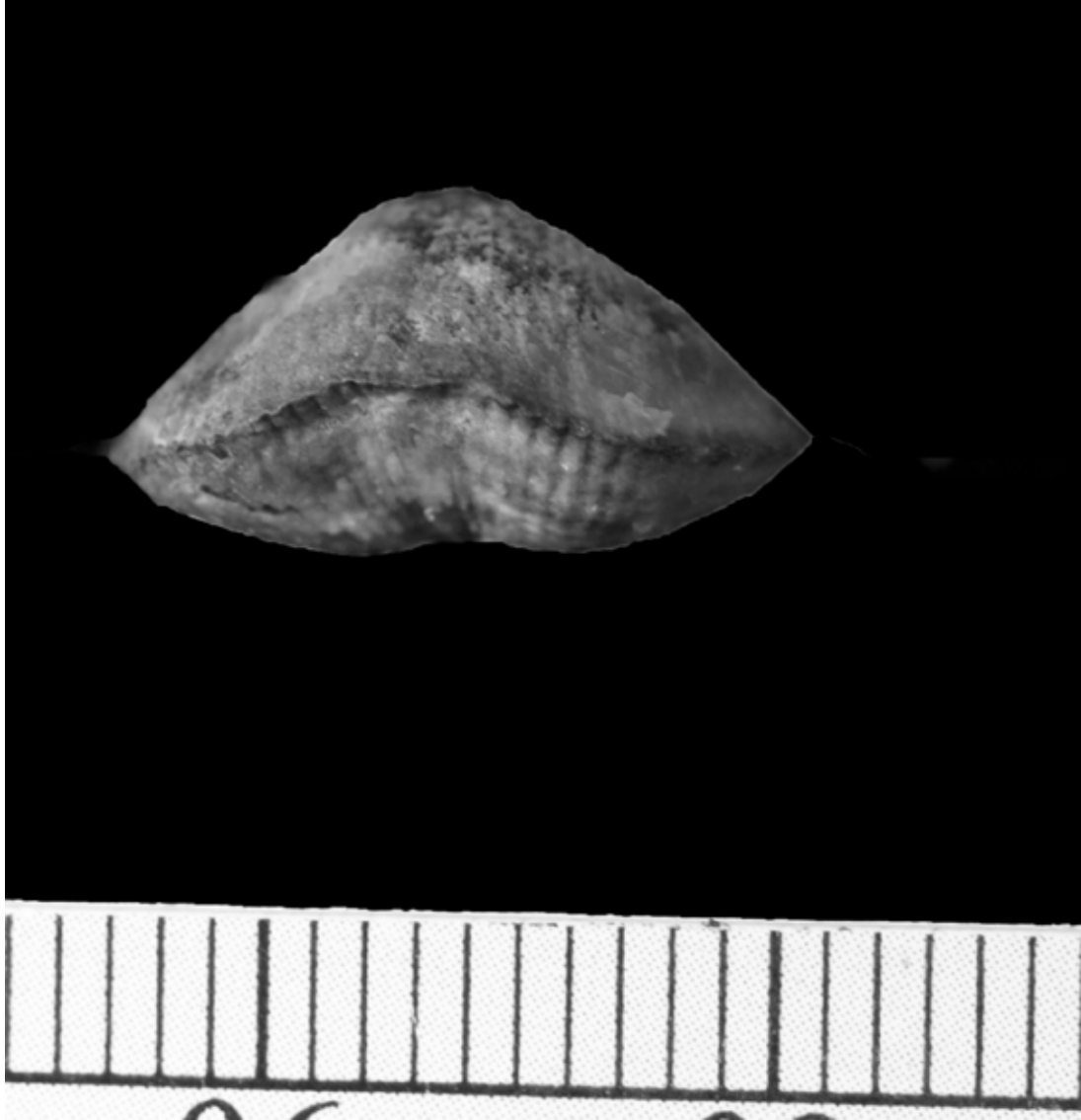
Another dalmanelloid brachiopod, probably *Onniella* sp., locality 19TA091-3, scale bar in mm. Specimen etched in HCL and then coated with ammonium chloride.



"Dalmanella" sp., ventral view, locality 19TA091-3. scale bar in mm.



"*Dalmanella*" sp., dorsal view, locality 19TA091-3. scale bar in mm.



"*Dalmanella*" sp., locality 19TA091-3, anterior view, scale bar in mm.



Undetermined rugose corals, 19TA091-3, scale bar in mm.

ROSIE COBBETT SAMPLES

19RC048-1

Stratigraphic unit: Bouvette

Lat. 64.2263, Long. -134.4822

Probable age from YGS spreadsheet: Silurian

Notes from YGS spreadsheet: calcareous orange weathered gray fresh fine grained siltstone with fossils

This sample consists of gray siltstone with infrequent scattered small disarticulated crinoid columnals. Also several stalked articulated crinoid columns. In addition, there are several smooth shield-like forms, these may be smooth trilobites and/or smooth leperditiid ostracods (less likely). None of the latter have external ornament, making further determination possible.

Age: This sample is accordant with a Silurian age, but the elements here also range throughout much of the Paleozoic.

Paleoecology: Fauna indicative of shelfal depths, but nothing more specific.

19RC85-1

Stratigraphic Unit: Bouvette

Lat. 64.5354, Long. -135.4862

Probable age from YGS spreadsheet: Silurian?

Notes from YGS spreadsheet: calcareous, fossiliferous siltstone

This sample contains: A generically indeterminate orthid brachiopod (4 isolated valves)

The sample is very hard and indurated, and attacking with a hammer and chisel did not expose any additional fossil material.

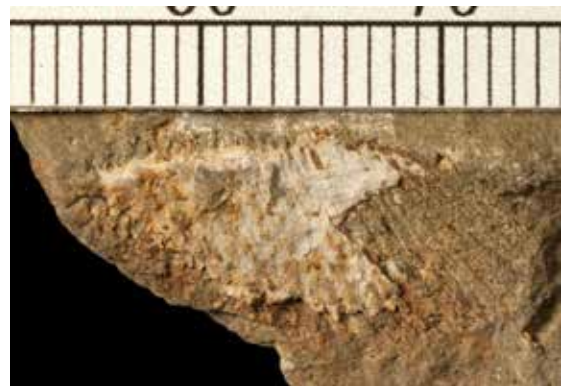
The fauna represented consists of four separate valves (exteriors), some appearing to be fragmentary, of fine-ribbed orthid brachiopods. No complete shell outlines are visible nor are critical internal features such as cardinalia. Hence, I can't identify the material to genus, but these are clearly orthids, possibly representing one or less likely two species.

Age: No clear age indicated due to lack of genus level identification, however the general morphotypes suggest an **Ordovician or Silurian age most likely**.

Paleoecology: The lack of articulated shells and fragmentary nature of the represented valves suggest that these were deposited in high-energy, rough water conditions in shelfal depths.

Recommendations: If you are able to revisit this locality, try to collect more fauna, especially for more whole and complete specimens

Undetermined orthid brachiopod specimens below (scale bar in mm) – all from locality 19RC085-1



Undetermined orthid brachiopod #1



Undetermined orthid brachiopod #2



Undetermined orthid brachiopod #3

Undetermined orthid brachiopod #4

19RC89-1

Stratigraphic Unit: Bouvette

Lat. 64.5309, Lat. -135.4897

Probable age from YGS spreadsheet: Silurian?

Notes from YGS spreadsheet: Dolomited sandstone

This sample consists of a dark gray to black dolopackstone. Rock has a fetid smell (non-petroliferous) when broken, and the fractures I created break across shell outlines, with no shell popping out. This suggests to me that the rock has been metamorphosed slightly and heated well above the limits of hydrocarbon retention. Small- to medium-sized shells can be recognized in cross-section and include:

small indeterminate solitary rugose coral (see photo)
indeterminate disarticulated brachiopods

indeterminate mollusks (some with thickened shells)

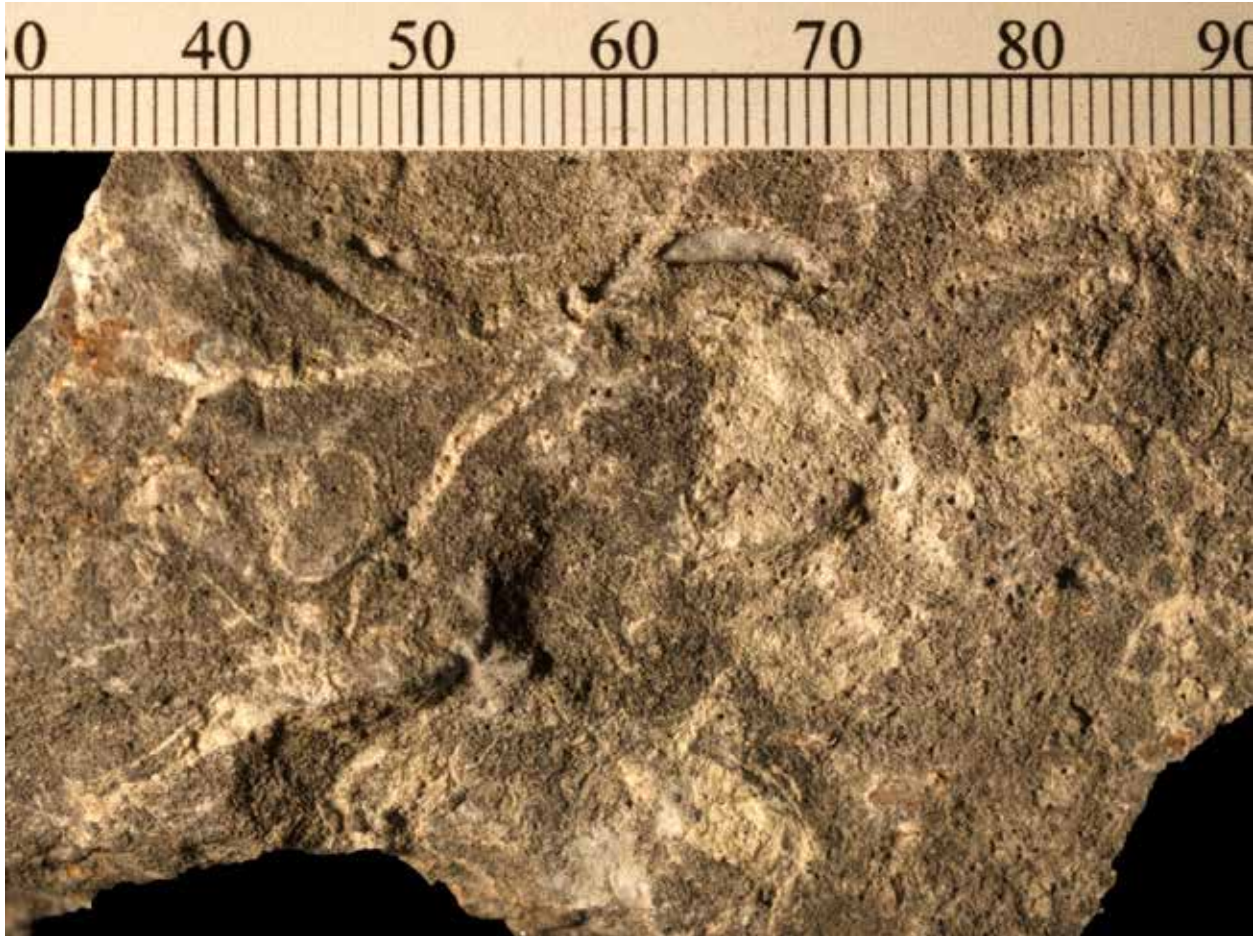
Age: As there are no generically identifiable faunal elements, I would only suggest a Silurian or Devonian age based on the morphotypes of the shells present. Definitely not Cambrian, and the shell morphologies in cross-section are not typical for Ordovician either. I have seen lots of similar fossiliferous dolostones in Alaska in this time frame. A Middle Devonian age would seem based on the relative stratigraphic position shown in your slides from the CTW presentation.

Age: **Silurian or Devonian age (probably Middle Devonian, based on the relative stratigraphic position shown in the photo from your CTW presentation).**

Paleoecology: Shallow-water, warm tropical shelf. Disarticulation of brachiopod shells indicate moderately high energy.



Small indeterminate solitary rugose coral (no scale bar) – locality 19RC089-1



Indeterminate mollusk shells and disarticulated brachiopods (scale bar in mm) – locality 19RC089-1

19RC106-2 (report by Mike Melchin, Feb. 18, 2020)

Stratigraphic unit: Bouvette

Lat. 64.5523, Long. -135.4862

Probable age from YGS spreadsheet: Ordovician?

Notes from YGS spreadsheet: chert

This sample contains three different taxa.

One is represented by distal fragments of what are most likely *Didymograptus* s.l.

The second is *Phyllograptus* sp.

The third is *Isograptus* cf. *victoriae lunatus*.

Mike Melchin comments: *Phyllograptus* and *Isograptus* have a relatively narrow range of stratigraphic overlap, co-occurring only in the upper Floian and basal part of the Dapingian. I think that upper Floian is more likely, probably the uppermost Floian *Isograptus victoriae*

lunatus Zone, although it could also be from either the immediately underlying or overlying zones as well. The didymograptid fragments are consistent with this.

Age: **stratigraphic overlap indicates an upper Floian to basal part of the Dapingian (late Early to early Middle Ordovician)**. Upper Floian (**late Early Ordovician**) more likely.

[Melchin notes that all of the graptolites in all of these collections are poorly preserved. Nevertheless, a few of the ages are pretty clear.]

19RC113-1

Stratigraphic Unit: Bouvette

Lat. 64.5514, Long. -135. 4440

Probable age from YGS spreadsheet: Silurian?

Notes from YGS spreadsheet: calcareous, fossiliferous siltstone

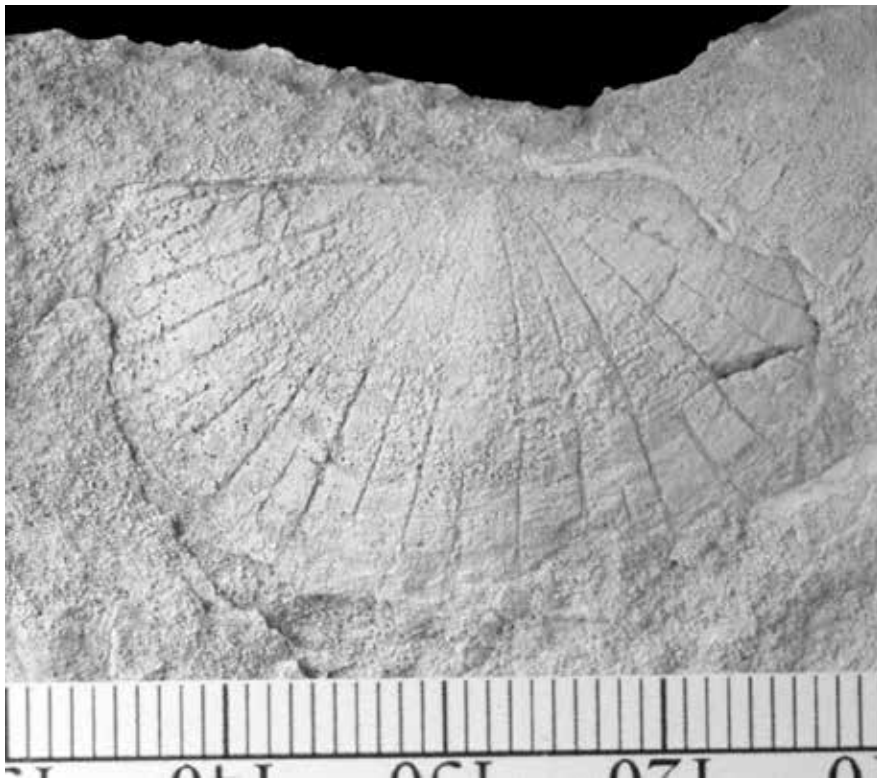
This sample contains: strongly parvicostellate brachiopods (possibly *Eoplectodonta*) According to my colleague Jin Jisuo, it would help if a dorsal interior can be found, to see if the cardinal process is strophomenoid or plectambonetoid type.

Also present in the sample is a large smooth trilobite pygidium (possibly bumastid) and a distinctive encrinurid trilobite.

Age: If the identification of *Eoplectodonta* is good, the suggested range is extensive: Ordovician-Silurian (Ludlow). The encrinurid trilobites have a similar long range.



Possibly the strongly parvicostellate brachiopod *Eoplectodonta*. Locality 19RC113. Scale bar in mm.



Possibly the strongly parvicostellate brachiopod *Eoplectodonta*. Locality 19RC113. Scale bar in mm.



Indeterminate large, smooth trilobite pygidium. Locality 19RC113, scale bar in mm.

Encrinurid trilobite pygidium, left side of view (left of brachiopod). Locality 19RC113. Scale bar in mm.

19RC140-1

Stratigraphic Unit: Bouvette

Lat. 64.5240, Long. -135.3539

Probable age from YGS spreadsheet: Silurian?

Notes from YGS spreadsheet: calcareous, fossiliferous siltstone, sandstone

This exciting collections contains: an ammonoid, identified by Prof. Dr. Thomas Becker
(M

central Nevada. The ammonoid is very exciting as it constitutes one of the oldest ammonoids reported from North America.

Age: late Early Emsian

Recommendations: This is my favorite locality, due in large part to the age specificity of the collected material. If you get back out there, collect more ammonoids, they should be worthy of a publication on their own rightt.

Reference:

Perry, D.G., and Chatterton, B.D.E., 1976, *Phacops* and other trilobites from Emsian age beds of the Delorme Formaton, Mackenzie Mountains, Northwest Territories: Canadian Journal of Earth Sciences, v. 13, p. 1466-1478.



The ammonoid Gen. nov. aff. *Oculoceras* n. sp., lateral view, locality 19RC140-1, scale bar in mm.



Gen. nov. aff. *Oculoceras* n. sp., opposing lateral view, locality 19RC140-1, scale bar in mm.



Gen. nov. aff. *Oculoceras* n. sp., venter view, locality 19RC140-1, scale bar in mm.



Phacops pygidium, locality 19RC140-1, scale bar in mm.



Trilobite pygidium, possibly *Lacunoporaspis* n. sp. A Perry and Chatterton, 1976, locality 19RC140-1, scale bar in mm.



Trilobite free cheek, locality 19RC140-1, scale bar in mm.

19RC149-2

Stratigraphic unit: Bouvette

Lat. 64.5284, Long. -1353654

Probable age from YGS spreadsheet: Silurian?

Comments from YGS spreadsheet: calcareous, fossiliferous siltstone and sandstone

This sample contains:

An indeterminate coral (large)

Another indeterminate coral represented by an external mold

Indeterminate fine ribbed orthid brachiopods (two different types)

Undetermined stropheodont brachiopod (one ventral valve, we need a good dorsal valve to further identify)

Pseudophorid gastropod

An articulated crinoid column



Indeterminate stropheodontid brachiopod (exterior of ventral valve). Scale bar in mm. Locality 19RC149-2. Scale bar in mm.



Indeterminate stropheodontid brachiopod. Same specimen as above. Etched in HCl) to show interior of ventral valve. Scale bar in mm. Locality 19RC149-2.



Fine-ribbed orthid brachiopods (two types), locality 19RC149-2, scale bar in mm.



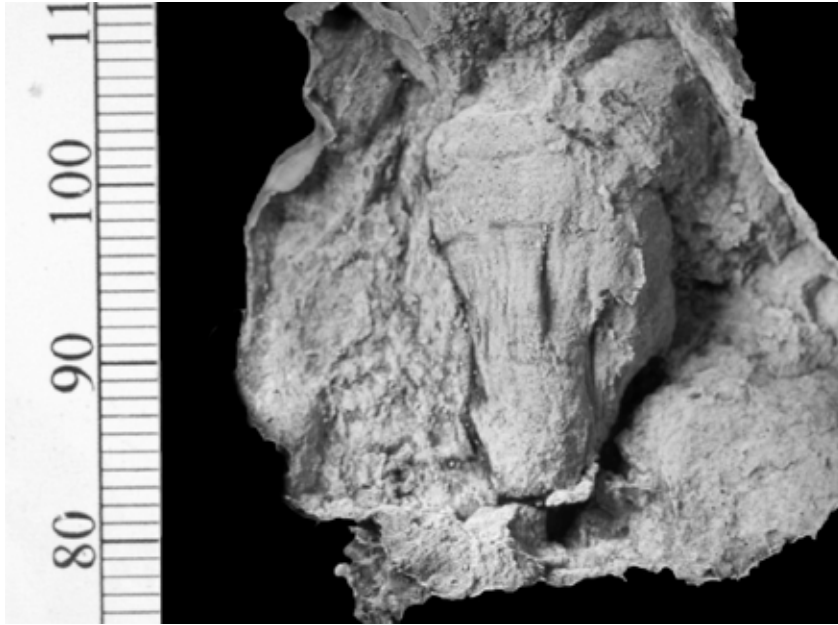
Pseudophoroid gastropod, locality 19RC149-2. Scale bar in mm. Need to see base of shell to further identify to genus.



19RC-149-2 Articulated crinoid column. Scale bar in mm.



Large undetermined solitary coral, scale bar in mm. Locality 19RC149-2



Another undetermined coral (rubber latex replica, smaller than specimen above. Scale in mm. Locality 19RC149-2.

Age: Silurian or Devonian. Despite the relative good diversity, the age remains vague, but it is clearly Silurian-Devonian. A much larger collection of brachiopods and gastropods from here should make the age more readily apparent. I am slightly more favorable to a Silurian age based on the type of stropheodontid brachiopod

Paleoecology: This relatively diverse collection indicates a shallow shelfal, tropical paleoenvironment.

Recommendation: A much larger collection of brachiopods and gastropods should be made in the future, as I think we could really highly refine the age. Think about it if perchance you visit the locality again next year.

19RC158-1 (report from Mike Melchin, March 5, 2020)

Stratigraphic unit: Bouvette

Lat. 64.5091, Long. -135.3302

Probable age from YGS spreadsheet: Ordovician?

Notes from YGS spreadsheet: silty limestone and black chert

This sample contains the following graptolite taxa:

Stimulograptus sp., likely either *S. sedgwickii* or *S. halli*

Glyptograptus sp.
Parapetalolithus cf. *giganteus*

Mike Melchin comments: This species assemblage suggests either a latest Aeronian or early Telychian age (Llandovery, Silurian) (*Stimulograptus sedgwickii* -*Spirograptus guerichi* zones).

Age: either a latest Aeronian or early Telychia age (Llandovery, early Silurian)

19RC225-2 (report from Mike Melchin, March 5, 2020)
Stratigraphic unit: Duo Lake
Lat. 62.4413, Long. -133.0540
Probable age from YGS spreadsheet: Ordovician
Comments from YGS spreadsheet: siltstone

Mike Melchin comments: This sample contains:
Glyptograptus or *Korenograptus* sp. indet.
Monograptid with hooked or hooded thecae

Age: This collection suggests a Llandovery (early Silurian) age, likely either Aeronian or early Telychian.

19RC242-1
Stratigraphic unit: Duo Lake
Lat. 62.4681, Long. -132.9910
Probable age from YGS spreadsheet: Ordovician
Comments from YGS spreadsheet: calcareous siltstone

I am sad to say that I don't see any bona-fide organic remains here. Four of the five pieces have broad flattened, yellowish-color streaks, possibly with some pyritic staining. However, try as I might, these are not graptolites, shapes are all wrong, (way too broad), and no thecae, sicula, or stipes visible. Sorry!

My identification would be: indeterminate, possibly biotic stick-like impressions

I was tempted to suggest very primitive plant scraps, which when communitated, can have similar appearance but there is also a clear lack of plant features. In addition, if the rocks are Ordovician, one would not expect plants this early.



19RC242 – indeterminate stick-like impressions (no age significance). Scale bar in mm.

19RC253-1 (report from Mike Melchin, March 5, 2020)

Stratigraphic unit: Duo Lake

Lat. 62.4782, Long. -133.0273

Probable age from YGS spreadsheet: Ordovician

Comments from YGS spreadsheet: siltstone and chert

Mike Melchin comments: This sample contains no graptolites.

Specimens may be plant fragments or, in some cases, possibly trace fossils.

Age: If they are plant fragments, it suggests an age likely **not older than late Silurian**.

R.B. Blodgett comments: Before I sent these images on to Mike, I also suggested that these were only plant fragments, and also no older than late Silurian.

19RC255-1 (report from Mike Melchin, March 5, 2020)

Stratigraphic unit: Duo Lake

Lat. 62.4782, Long. -133.0288

Probable age according to YGS spreadsheet: Ordovician

Comments from YGS spreadsheet: shale interbedded with chert pebble conglomerate and chert quartz greywacke.

Mike Melchin comments: This sample contains no graptolites.

Specimens appear to be plant fragments.

If they are plant fragments, it suggests an age likely not older than late Silurian, likely younger.

Age: **Not older than late Silurian.**

R.B. Blodgett (report dated Dec. 31, 2019) reports on the same collection:

Blodgett comments: I finished my examination of your collection from locality 19RB255-1, and here is what I have to report:

abundant plant fragments, highly broken and incomplete

Age: Devonian or younger, however a latest Silurian age cannot be ruled out.

Comments: This locality seems to have abundant plant material, but the fragmentary nature of the material prevents more definitive age determination. I spent much of the late afternoon perusing available Devonian plant literature, but none of your material is complete enough to hazard a good guess at this point. However, a latest Silurian age cannot be totally ruled out. Some of the material can be compared to the primitive plant *Psilophyton*, but it is still a stretch. The abundance of plant material suggests it would make a nice palynological sample (spores and pollen). I would hazard a guess that there is a land area nearby to account for such abundance of material. The Early - Early Middle Devonian is characterized by primitive taxa such as *Psilophyton*. However, by the Givetian we start to see real "trees" showing up, with some of the best known complex Devonian plant localities in the Maritime Provinces of Canada (New Brunswick) and the famous Gilboa forest of New York State.

19RC257-1 (report from Mike Melchin, March 5, 2020)

One slab contains specimens of a biserial graptolite with climacograptid or amplexograptid thecae. No other details are discernible. Age range could be anywhere from late Dariwillian (Middle Ordovician) to mid Llandovery.

The other specimen is unknown to me.

19RC285-1 (report from Mike Melchin, March 5, 2020)

This sample contains several specimens of biserial graptolites with climacograptid or amplexograptid thecae. No other details are discernible. Age range could be anywhere from late Dariwillian (Middle Ordovician) to mid Llandovery.

Age: anywhere from late Dariwillian (Middle Ordovician) to mid Llandovery (early Silurian).

19RC289-1 (report from Mike Melchin, March 5, 2020)

Stratigraphic unit: Duo Lake?

Lat. 62.4915, Long. -132.9627

Probable age from YGS spreadsheet: Ordovician?

Notes from YGS spreadsheet: could be Early Group, graptolites are different here than typical Duo Late graptolites.

Mike Melchin notes: This sample contains:

Diplacanthograptus caudatus

Dicellograptus pumilis

Dicellograptus sp. indet.

Mike Melchin comments: Both of these species indicate the lower Katian (Upper Ordovician). Either the *D. caudatus* Zone or *D. spiniferus* Zone (together these equate with the *D. clingani* Zone of Britain).

Age: lower (early) Katian (Upper Ordovician).

TIFFANI FRASER SAMPLES

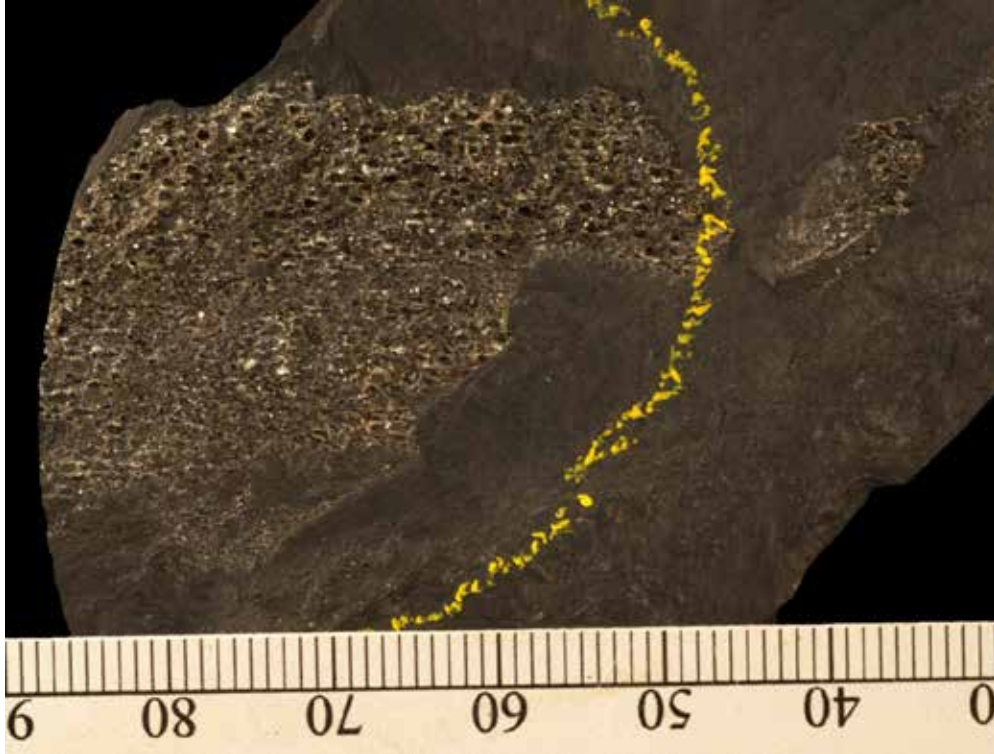
19-TF-12 (T-88-1 @470.3 m)

Stratigraphic unit: ?Fuller Lake Member (Portrait Lake Formation)

Lat. 63.1553, Long. -130.1535

Probable age? From YGS spreadsheet: ?Upper Devonian

Notes from YGS spreadsheet: fish plate or sponge on shale, pyritized



Possible abiotic form of mineralization (acc. to Dr. Plax, Minsk, Belarus). Scale bar in mm.

My initial impression was that this scattering of crystal faces possibly represented a fish. Sent the specimen at the suggestion of Yury Zaika (Minsk, Belarus) to Dr. Dmitry Plax, a Devonian fish specialist also living in Minsk. Dr. Plax replied that this is not a fish fossil, and probably just a strange form of mineralization (possible sulfides?)

Age: Has absolutely no age significance.

19-TF-13

Stratigraphic unit: Sapper Fm/ Mac Pass volcanics contact

Lat. 63.2284, Long. -130.3812

Probable age from YGS spreadsheet: ?Middle Devonian

Notes from YGS spreadsheet: brachiopod in very fine sandstone

This sample consists of a single ventral valve of the brachiopod *Spinatrypina?* sp.

Age: If the genus is correctly identified, a **late Early Devonian to Early Late Devonian** age is possible. The genus is widespread in rocks of this age in western North America.

Recommendations: Relatively good specimen showing slight tectonic elongation. I highly recommend getting more brachiopods from here to confirm genus identification and resolve the age assignment.



Spinatrypina? sp. 19-TF-13 This genus ranges in age from late Early Devonian to early Late Devonian. I sent this image to another brachiopodologist colleague, Valeryi V. Baranov, of Yakutsk (Siberia), Russia and he concurs with this identification.

19-TF-15@39.4 m

Stratigraphic unit: ?Sapper Fm. (Road River Gp.)

Lat. 63.1760, Long. -130.1765

Probable age from YGS spreadsheet: ?Middle Devonian

Notes from YGS spreadsheet: DDH 91-17, fossil pieces incl. brachiopod

The sample contains a number of large mollusk-like shell fragments. Unfortunately this rock does not break across shell surfaces so no exteriors can be exposed.

Age: Probably Paleozoic, but need more material to identify to age.

Paleoecology: Appears to be shallow carbonate environment. Broken and fragmented shells suggest relatively high energy environment.



Shell hash from locality 19-TF-15@39.4 m

Recommendation: Collect much larger megafauna if possible.

19-TF15@70.3 m

Stratigraphic unit: ?Sapper Fm. (Road River Gp.)

Lat. 63.1760, Long. -130.1765

Probable age from YGS spreadsheet: ?Middle Devonian

Notes from YGS spreadsheet: DDH 91-17; coral

Sample consists wholly of "algal biscuits", or algal coated grains.

Age: No particular age significance. I see similar objects in rocks of Cambrian-Devonian age throughout Alaska, in shallow-water restricted platform carbonate environments. Seemingly lagoonal.



"algal biscuits" from locality 19-TF-15@70.3 m.

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Prepared by Robert B. Blodgett, Consulting Geologist/Paleontologist, 2821 Kingfisher Drive, Anchorage, Alaska 99502, USA [email: RobertBlodgett@gmail.com; ph. 907-903-9222]; prepared with assistance from Yury Zaika, Jin Jisuo, David Holloway, David M. Rohr, and John F. Taylor.

Report Date: February 28, 2021

INTRODUCTION

The report below presents taxonomic identifications of megafossils gathered in 2020 by Rosie Cobbett of the Yukon Geological Survey for the following 10 localities: 20RC003-1, 20RC008-1, 20RC018-1, 20RC044-1, 20RC045-1, 20RC46-1, 20RC47-1, 20RC074-1, 20RC167-1, and 20RC183-1.

I take full responsibility for identifications of the invertebrate marine shelly fauna, with significant assistance on several faunal groups by Yury Zaika (Minsk, Belarus for tabulate corals rugose corals), Jin Jisuo (University of Western Ontario, London, Ontario on Ordovician brachiopods), David Holloway, Museum Victoria, Melbourne, Australia on Ordovician trilobites, and David M. Rohr (Sul Ross State University, Alpine, Texas on Ordovician gastropods), and John F. Taylor (Geosciences Dept., Indiana University of Pennsylvania, Indiana, PA), also on Ordovician trilobites.

20RC003-1

Geologic Unit: Marmot/Bouvette

Rock type: Siltstone

Lat. 64.530962

Long. -135.249148

Location Ervin Creek

Guessed age from YGS spreadsheet: Silurian

Taxa: *Ptychopleurella* sp. (brachiopod), monotaxic collection of numerous disarticulated valves. This species differs from the similar age *Ptychopleurella* cf. *P. lapworthi* (Davidson) of Ross and Dutro (1966) from the uppermost member (Late Ordovician) of the

Jones Ridge Limestone, east-central Alaska in being much larger in size and having more radial ribs. It likewise differs from *Ptychopleurella uniplicata* Cooper, 1956 of Rasmussen, Harper, and Blodgett, 2012 from the Late Ordovician strata near White Mountain, McGrath Quad., west-central Alaska in the same characters.

Fossil Age: According to the revised Brachiopod Treatise (v. 3, p. 740) this genus is ascribed a rather long stratigraphic range, Lower Ordovician (Llanvirnian) to Lower Devonian (Emsian). However, the close stratigraphic proximity and associations with localities 20RC008-1 and 20RC018-1 suggest a Late Ordovician age.

Paleoecology: The relatively large size of the *Ptychopleurella* (compared to other deep-water associations of *Ptychopleurella* in the Late Ordovician of Alaska) seem consistent with interpreting this monotaxic assemblage as probably representing a much shallower shelfal depositional setting than their Alaska counterparts.



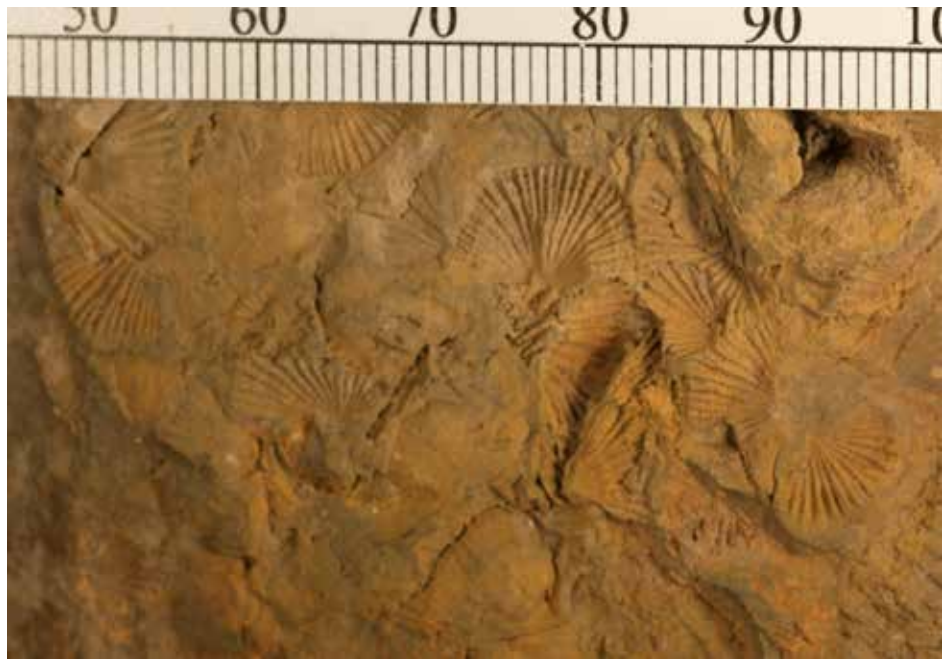
20RC003-1 *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm. Jisuo Jin comments: Most of the shells look like *Ptychopleurella*, judging by the growth lamellae, ventral muscle field, and the simple cardinal process. I have never seen so many of them together, almost like a near-monospecific assemblage. In most other collections I worked with, this genus was usually a minor component. Not sure what significance this would imply.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm. *Ptychopleurella* sp. (brachiopod). Scale bar marked in mm. Jisuo Jin comments: Most of the shells look like *Ptychopleurella*, judging by the growth lamellae, ventral muscle field, and the simple cardinal process. I have never seen so many of them together, almost like a near-monospecific assemblage. In most other collections I worked with, this genus was usually a minor component. Not sure what significance this would imply.



20RC003-1. *Ptychopleurella* sp., latex replicas of internal molds of ventral and dorsal valves. Scale bar marked in mm.



20RC003-1. *Ptychopleurella* sp., latex replica of external mold of a dorsal valve. Scale bar marked in mm.

20RC008-1

20RC008-1

Geologic Unit: Marmot/Bouvette

Rock Type: Siltstone

Lat. 64.535523

Long. -135.223121

Location: Ervin Creek

Guessed age from YGS spreadsheet: Silurian.

Taxa: *Catenipora* sp. (tabulate coral), several types of undetermined solitary rugose corals, *Palaeophyllum*, very similar to *P. rugosum* (a fasciculate rugose coral), and *Maclurites* sp. (gastropod).

Age based on fossils: Late Ordovician. Yury Zaika (email Jan. 2, 2021) reports “Concerning the oldest *Catenipora*, the most ancient representative which I know (*Catenipora* sp.) is probably uppermost Sandbian and (or) lowermost Katian (Upper Ordovician), reported from Subpolar Urals. I haven't seen these specimens and know this only from literature . There may be some species of this age in other areas, but I'm not quite sure. Beginning with Katian, they become common everywhere. Most Ordovician *Catenipora* species are commonly reported from Katian.”

TABULATE CORALS



20RC008-1. Two differing views of the tabulate coral *Catenipora* sp., specimen #1. Scale bar in mm.



20RC008-1. Two differing views of the tabulate coral *Catenipora* sp., specimen #2. Scale bar in mm.



20RC008-1. Two differing views of the tabulate coral *Catenipora* sp., specimen #3. Scale bar in mm.

RUGOSE CORALS



20RC008-1. Solitary rugose coral. Specimen #1, note short septa. Scale bar in mm.



20RC008-1. Solitary rugose coral. Specimen #2, upper and lower views, note longer septa than preceding specimen. Scale bar in mm.



20RC008-1. Solitary rugose coral. Specimen #3 in two views. Scale bar in mm.





20RC008-1. Fasciculate rugose coral (*Palaeophyllum*, very similar to *P. rugosum* Billings), same corallum in five differing orientations. Scale bar in mm. Yury Zaika (email Dec. 12,

2020) comments: “the corals seem very similar to *Palaeophyllum rugosum* Billings (Trentonian or upper Blackriverian, Lower Katian, if I am not mistaken). If you could later cut several samples in the cross and longitudinal directions (at least cut some part of at least one corallite in each of these directions), that would be helpful”.



20RC008-1. Fasciculate rugose coral (*Palaeophyllum*, very similar to *P. rugosum* Billings), a second specimen. Scale bar in mm. Yury Zaika (email Dec. 12, 2020) comments: “the corals seem very similar to *Palaeophyllum rugosum* Billings (Trentonian or upper Blackriverian, Lower Katian, if I am not mistaken). If you could later cut several samples in the cross and longitudinal directions (at least cut some part of at least one corallite in each of these directions), that would be helpful”.

GASTROPODS



20RC008-1. *Maclurites* sp., basal view. Scale bar in mm.



20RC008-1. *Maclurites* sp., apertural view. Scale bar in mm.



20RC008-1. *Maclurites* sp., apical view. Scale bar in mm.



20RC008-1. *Maclurites* sp., lateral view. Scale bar in mm.

20RC018-1

20RC018-1

Geologic Unit: Marmot/Bouvette

Rock Type: Siltstone

Lat. 64.537493

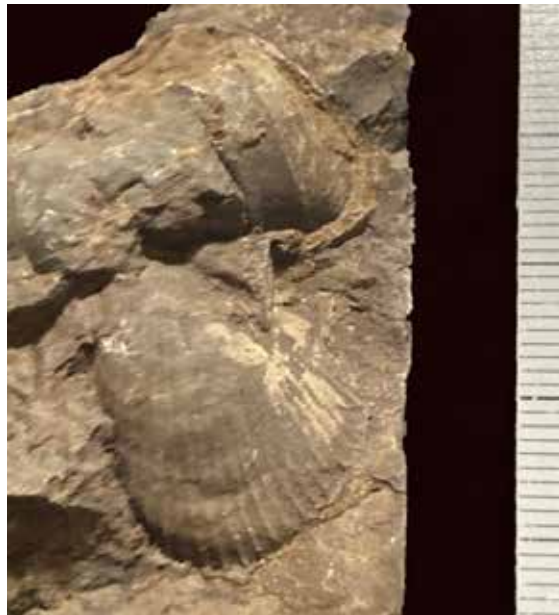
Long. -135.263394

Location: Ervin Creek

Guessed age from YGS spreadsheet: Silurian

Taxa: Taxa: *Byssonychia* (fine-ribbed bivalve), a large smooth bivalve internal mold (steinkern) -these may prove to be internal molds of the foregoing *Byssonychia* and *Lophospira* (high-spined gastropod)

Age based on fossils: Late Ordovician



20RC018-1 *Byssonychia* (ribbed bivalve below), base of the gastropod *Lophospira* (above, and nearly horizontal). These are typical Middle to Late Ordovician genera (neither found in the Silurian). Scale bar in mm. This *Byssonychia* compares favorably with the *Byssonychia radiata* var. *walkeri* Wilson, 1926 (p. 29, Pl. V, figs. 19-20) of uppermost Ordovician strata of the Beaverfoot beds in British Columbia



20RC018-1 rubber latex replica of large block, showing both *Byssonychia* (ribbed bivalve) and smooth internal molds of a bivalve (possibly internal mold of *Byssonychia*). Scale in mm.



20RC018-1. Siltstone block with numerous internal molds of undetermined bivalve and few scrappy *Byssonychia* sp. (ribbed bivalve). Note the internal molds may ultimately prove to be the counterpart mold to the externally ribbed *Byssonochia*. Scale bar in mm.



20RC018-1. Siltstone block with both ribbed bivalves (*Byssonychia* sp.) and an undetermined bivalve (internal mold). The latter may prove to be the counterpart internal mold to the externally ribbed *Byssonochia*. Scale bar in mm.



20RC018-1 Latex rubber latex replica of block bearing clustered specimens of *Byssonychia* (ribbed bivalve)



20RC018-1 Latex rubber latex replica of block bearing specimens of *Byssonochia* (ribbed bivalve) and an undetermined bivalve internal mold. Scale bar in mm.

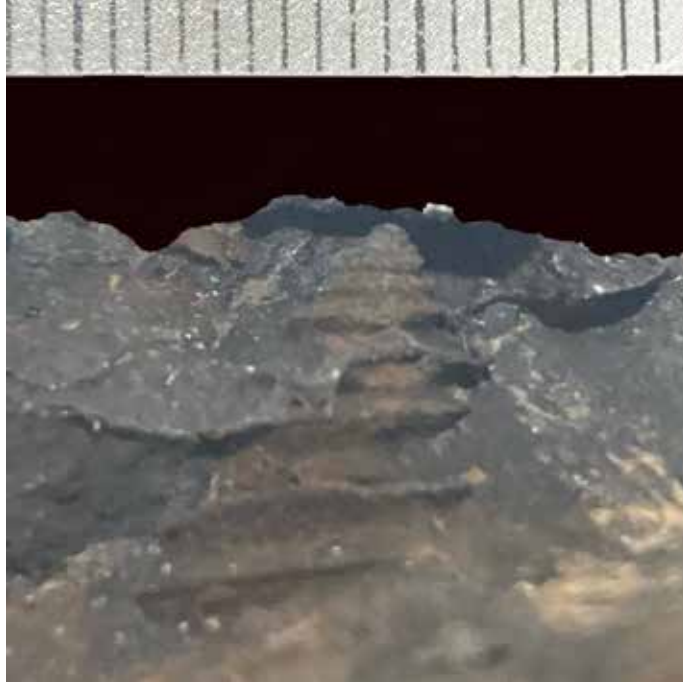
GASTROPODS



20RC018-1 *Lophospira* sp. (gastropod), side view. Scale in mm.



20RC018-1 *Lophospira* sp., side view (gastropod)



20RC018-1 rubber latex replica of an external mold of the gastropod *Lophospira* sp.

20RC044-1

20RC044-1

Geologic Unit: Marmot/Bouvette

Rock Type: Calcareous Siltstone

Lat. 64.533697

Long. -135.4809

Probable age from YGS spreadsheet: Ordovician/Silurian

Taxa: undetermined solitary rugose corals (several types); *Amblyosiphonella* or *Amblyosiphonelloides* sp. 1 (sphinctozoan sponge); and an asaphid trilobite.

Age according to fossils: Late Ordovician.

RUGOSE CORALS



20RC044-1. Solitary rugose coral (upper view). Scale bar marked in mm.



20RC044-1. Solitary rugose coral. Scale bar marked in mm.



20RC044-1. Solitary rugose coral (same as above, but slightly differing view). Scale bar marked in mm.



20RC044-1. Solitary rugose coral (same specimen as in two preceding views, but taken laterally). Scale bar marked in mm.



20RC044-1. Solitary rugose coral. Scale bar in mm.



20RC044-1. Solitary rugose coral. Scale bar in mm.



20RC044-1. Solitary rugose coral. Scale bar in mm.



20RC044-1. Solitary rugose coral. Scale bar in mm.



RC044-1. Solitary rugose coral. Scale bar in mm.

SPHINCTOZOAN SPONGE



RC044-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 1. Sponges embedded in siltstone block (unetched in acid). Scale bar marked in mm. Specimen being

retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after completion of study.



20RC044-1. Acid etched Sphinctozoan sponges (*Amblyosiphonella* or *Amblyosiphonelloides* sp. 1) in siltstone block (essentially same view as above). Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after completion of study.

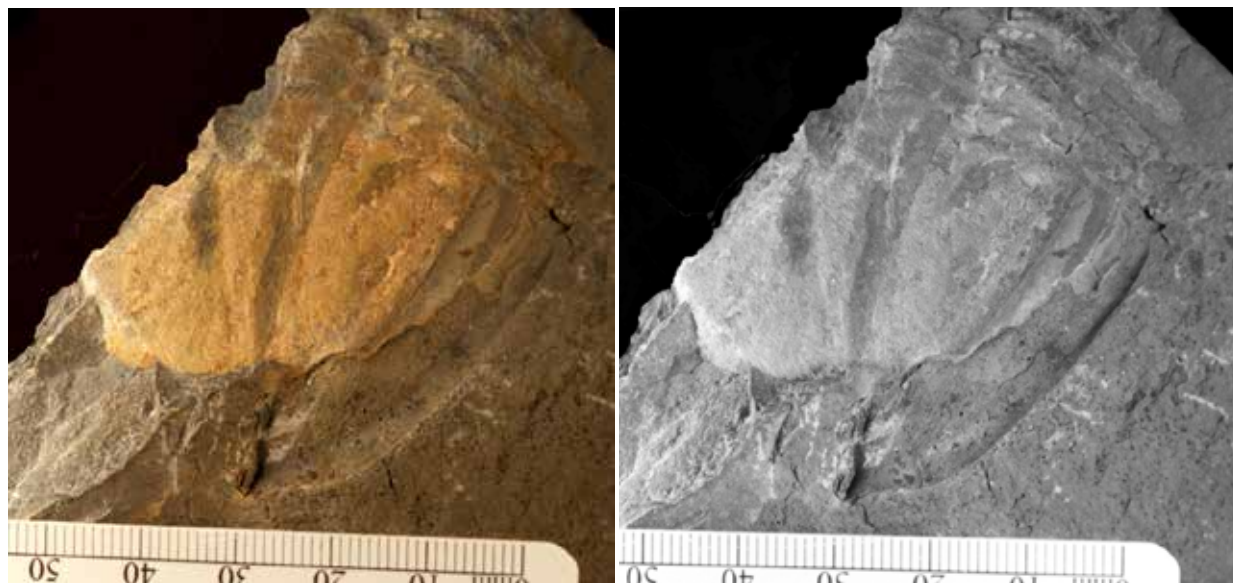


20RC044-1. Acid etched sphinctozoan sponges (*Amblyosiphonella* or *Amblyosiphonelloides* sp. 1) in siltstone block. Same specimen as above. Scale bar marked in mm.



20RC044-1. Close up view of acid etched sphinctozoan sponge (*Amblyosiphonella* or *Amblyosiphonella* sp. 1). Scale bark marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after completion of study.

TRILOBITES



20RC044-1. Asaphid trilobite pygidium in color and black and white. Scale bar marked in mm.

Comment by David Holloway (dated Jan. 12, 2021). The pygidium belongs to the Asaphidae, and I'm sorry that I can't tell you more than that. I have no experience with asaphids and I find their taxonomy perplexing.

20RC045-1

20RC045-1

Geologic Unit: Martmot/Bouvette

Rock Type: Calcareous Siltstone

Lat. 64.53406

Long. -135.48

Location: Erwin Creek

Guessed age from YGS spreadsheet: Ordovician/Silurian

Taxa: Trilobites: illaenid trilobite (possibly *Stenopareia*), *Failleana*, asaphid trilobite, harped trilobite; Brachiopods: *Strophomena* sp. 1 (same species present in 20RC047-1); and fenestellid bryozoans.

Age according to fossils and stratigraphic position: Late Ordovician.

TRILOBITES



20RC045-1 (photo DSCF6049 of Rosie Cobbett). Illaenid trilobite, possibly *Stenopareia*. Scale bar in mm.

Comment by David Holloway (1.13.2021, written comm.): 6049, 6054, 6055 are of an Illaenid and I assume are conspecific. The species could potentially be accommodated in *Stenopareia* as that genus is presently understood but it may be different from the species from 20RD046, based only on the observation that the fixigena in 6054 appears(?) to be wider in relation to the glabella. In 6049 the mass in front the pygidium on the left appears to be the displaced cephalon descending into the matrix but I can't make much out of it.

Further comment by David Holloway (1.27.2021): I haven't seen image 6057 before. It is an incomplete cephalothorax of the same taxon as in Rosie's 6049 and 6054, so *Stenopareia*.



20RC045-1 (photo DSCF6050 of Rosie Cobbett). Asaphid trilobite pygidium. Scale bar in mm.

Comment by David Holloway (1.13.2021, written commun.): 6050, 6051 and 6052 are asaphid pygidia, possibly the same species as pygidium # 1 from 20RC044 if they are from a similar stratigraphic level.



20RC045-1 (photo DSCF6051 of Rosie Cobbett). Asaphid trilobite pygidium. Scale bar in mm.

Comment by David Holloway (1.13.2021, written commun.): 6050, 6051 and 6052 are asaphid pygidia, possibly the same species as pygidium # 1 from 20RC044 if they are from a similar stratigraphic level.



20RC045-1 (photo DSCF6052 of Rosie Cobbett). Asaphid trilobite pygidium and fenestellid bryozoans (below). Scale bar in mm.

Comment by David Holloway (1.13.2021, written commun.): 6050, 6051 and 6052 are asaphid pygidia, possibly the same species as pygidium # 1 from 20RC044 if they are from a similar stratigraphic level.



20RC045-1 (photo DSCF6054 of Rosie Cobbett). Illiaenid trilobite, possibly *Stenopareia*. Scale bar in mm.

Comment by David Holloway (1.13.2021, written comm.): 6049, 6054, 6055 are of an Illaenid and I assume are conspecific. The species could potentially be accommodated in *Stenopareia* as that genus is presently understood but it may be different from the species from 20RC046, based only on the observation that the fixigena in 6054 appears(?) to be wider in relation to the glabella. In 6049 the mass in front the pygidium on the left appears to be the displaced cephalon descending into the matrix but I can't make much out of it.

Further comment by David Holloway (1.27.2021): I haven't seen image 6057 before. It is an incomplete cephalothorax of the same taxon as in Rosie's 6049 and 6054, so *Stenopareia*.

Comment by John Taylor: Image 6 (DSCF 6054) also looks like an asaphid such as *Isotelus*, although the broader and shorter pygidium might indicate otherwise.



20RC045-1 (photo DSCF6053 of Rosie Cobbett), incomplete thoracopygon of an effaced trilobite (could possibly be assigned with question of *Failleana* Chatterton and Ludvigsen, 1976 – see comments below. Scale bar in mm.

Comment by David Holloway (1.13.2021); The incomplete thoracopygon of an effaced taxon in 6053 is not the same as that in 6049, 6054 and 6055 because the thorax is nonfulcrate (i.e. the pleurae are downturned virtually from the axial furrow and there is no appreciable horizontal portion adaxially). It could possibly be assigned with question to *Failleana* Chatterton & Ludvigsen, 1976, a bit of a stretch without a cephalon. *Failleana* has been allied with illaenids, scutelluids or styginids by various people, and some species assigned to the genus don't belong there.

Further comment by David Holloway (Jan. 27, 2021): As I mentioned, the smooth trilobite in her 6053 is different and possibly belongs to *Failleana*. Some of the species that have been assigned to *Failleana* do not belong there in my view; species I assign to the genus have a stratigraphic range of Darriwilian to Katian.

Comment by John Taylor: Images 5 (DSCF6053) and 7 (DSCF6055) also have more circular pygidia, and the preserved thoracic segments on image 5 display very wide axial rings that suggest (to me, anyway) that they are more likely illaenids than asaphids. The somewhat narrow axial rings on the partial skeleton in image 9 are more like those of the asapid genera with which I am familiar.



20RC045-1 (DSCF6055 photo of Rosie Cobbett). Illaenid trilobite, possibly *Stenopareia*. Scale bar in mm.

Comment by David Holloway (1.13.2021, written comm.): 6049, 6054, 6055 are of an Illaenid and I assume are conspecific. The species could potentially be accommodated in *Stenopareia* as that genus is presently understood but it may be different from the species from 20RC046, based only on the observation that the fixigena in 6054 appears(?) to be wider in relation to the glabella. In 6049 the mass in front the pygidium on the left appears to be the displaced cephalon descending into the matrix but I can't make much out of it.



20RC045-1 (photo DSCF6056 of Rosie Cobbett). Harpid trilobite. Scale bar in mm.

Comment from John Taylor: Image 8 (DSCF6056) is the one I feel comfortable identifying as some genus of harpid (Family Harpidae) trilobite on the basis of a large pitted fringe,

seen here in an unusual angle from below on an enrolled, fairly complete skeleton. It appears that the rock is breaking cooperatively, breaking around rather than through the shell material. A careful split of that specimen is likely to expose the upper (dorsal) surface of the cephalon (head), which would allow for a more precise identification of the harpid genus represented.



20RC045-1 (photo DSCF6057 of Rosie Cobbett). *Stenopareia* according to David Holloway (email of Jan. 27, 2021) Scale bar in mm.

D. Holloway comments (email Jan. 27, 2021): I haven't seen image 6057 before. It is an incomplete cephalothorax of the same taxon as in Rosie's 6049 and 6054, so *Stenopareia*.



20RC045-1 (photo DSCF6058 of Rosie Cobbett). *Strophomena* sp. 1. Same species as in 20RC047-1. Scale bar in mm.

Age: Late Ordovician

20RC046-1

20RC046-1

Geologic Unit: Castle Mountain

Rock Type: Calcareous Siltstone

Lat. 64.55204

Long. -135.442658

Location: Erwin Creek

Guessed age from YGS spreadsheet: Ordovician/Silurian

Taxa: undetermined strophomenid brachiopod, undetermined stropheodontid brachiopod, unidentified rhynchonellid brachiopod, possibly *Hypsiptycha*, *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2 (sphinctozoan sponge), illaenid trilobite belonging to the genus *Stenopareia* Holm, 1886, *Maclurites* sp. (gastropod), *Loxonema* sp. (gastropod), the cyrtoconid nautiloid genus *Winnipegoceras*.

Age: Late Ordovician

Comments: The brachiopods present would hold much more potential if further material could be gathered showing internal features.

BRACHIOPODA



20RC046-1 ventral valve of undetermined strophomenid brachiopod (B&W photo of latex mold)



20RC046-1 ventral valve of undetermined strophomenid brachiopod (color photo, same specimen as above).



20RC046-1 undetermined articulated stropheodontid brachiopod (B&W photo)



20RC046-1 undetermined articulated stropheodontid brachiopod (color photo, same specimen as B&W photo above)



20RC46-1. Unidentified rhynchonellid brachiopod, possibly *Hypsiptycha*. Color and B&W images. Scale bar marked in mm.

SPHINCTOZOAN SPONGES



20RC046-1 Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and

Michael Link (both of Germany). Material will be returned to Canada after completion of study.



20RC046-1. Close up view of one of the sphinctozoan sponges shown in preceding view. Note well developed pores on external surface. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany).



20RC046-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after study.



20RC046-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Will be returned to Canada after study.



20RC046-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after study.

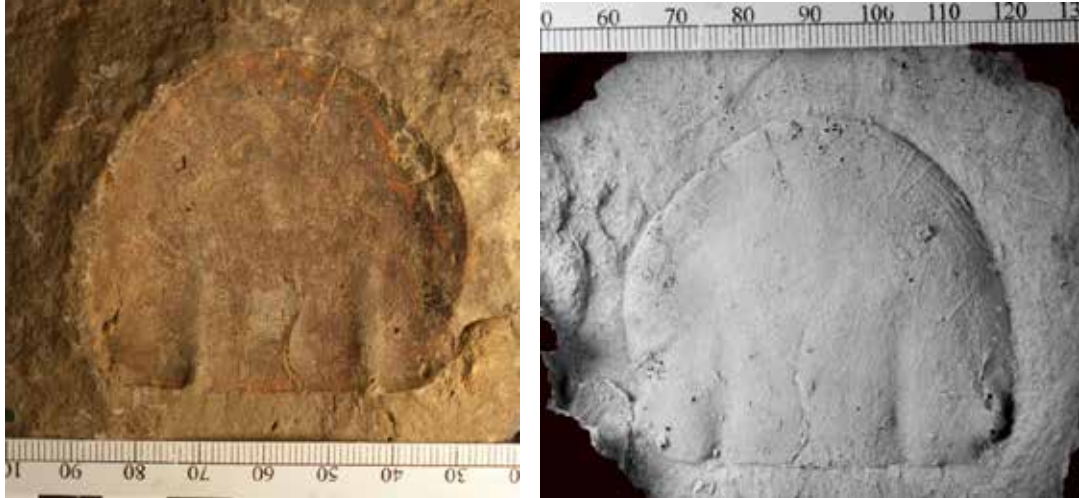


20RC046-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after study.



20RC046-1. Sphinctozoan sponge: *Amblyosiphonella* or *Amblyosiphonelloides* sp. 2. Scale bar marked in mm. Specimen being retained for further study by Baba Senowbari-Daryan and Michael Link (both of Germany). Material will be returned to Canada after study.

TRILOBITES



20RC046-1. Cranidium of the illaenid trilobite *Stenopareia* Holm, 1886.

Comment by David Holloway (Jan. 12, 2021): The cranidium in images 20RC046 is an Illaenid belonging to *Stenopareia* Holm, 1886. That genus as presently construed is probably polyphyletic, but from the limited morphological information available from just a cranidium your specimen appears to be not too dissimilar to the type species. Information from other exoskeletal parts is needed.

GASTROPODA



20RC046-1. *Maclurites* sp. (gastropod). Basal view. Scale bar marked in mm.



20RC046-1. *Maclurites* sp. (gastropod). Lateral view. Scale bar marked in mm.



20RC046-1. *Loxonema* sp. (gastropod), External and internal molds (compressed). Scale bar marked in mm.



20RC046-1. *Loxonema* sp. (gastropod). Latex replica cast of the upper part of the specimen shown above. Scale bar marked in mm.



RC046-1. Several specimens of the high-spired gastropod *Loxonema*. Scale bar marked in mm.

CEPHALOPODA



20RC046-1. Two views of the cyrtocoid nautiloid genus *Winnipegoceras* (Red River element). This genus is restricted to the Upper Ordovician. Compare with specimen shown in Wilson, 1975, Pl. 12, fig. 2 . Scale bar in mm.

20RC047-1

20RC047-1

Geologic Unit: Marmot/Bouvette

Rock Type: Calcareous Siltstone

Lat. 64.55113

Long. -135.444704

Location: Castle Mountain

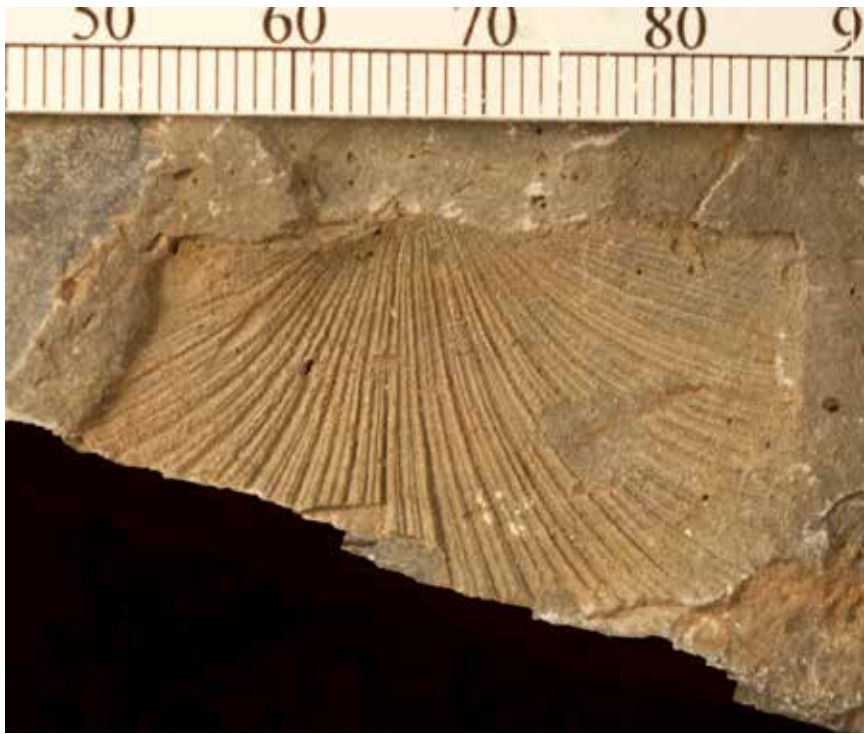
Guessed age from YGS spreadsheet: Ordovician/Silurian

Age according to fossils: Late Ordovician.

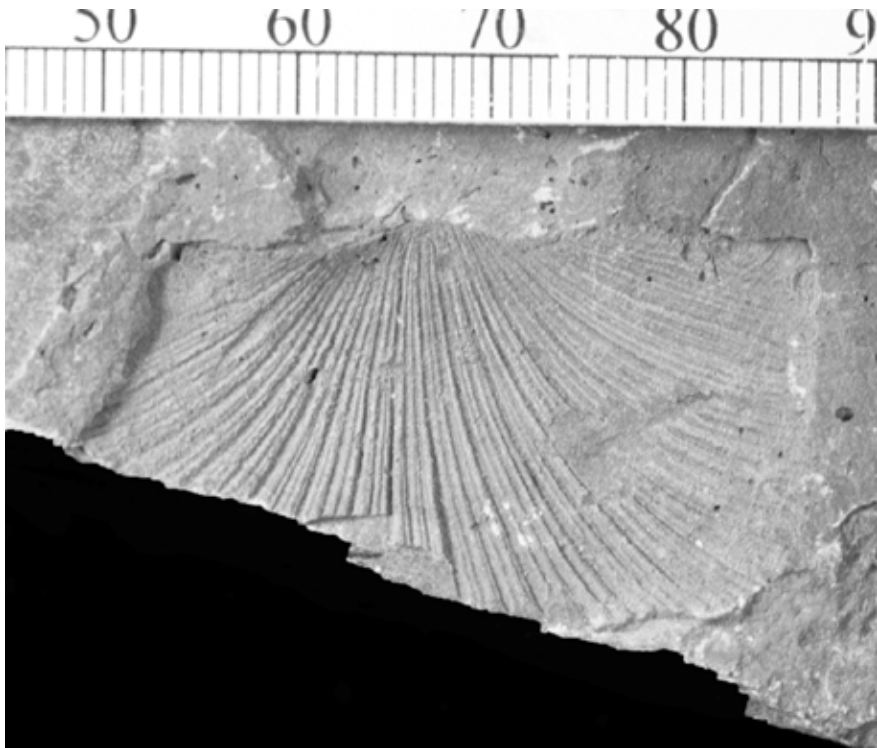
Taxa: Either a small *Plaesiomys*, or a dalmanelloid brachiopod, *Strophomena* sp. 1 (brachiopod) (probably same species in 20RC045-1), *Strophomena* sp. 2.

Comment by Jisuo Jin: He says the brachiopod fauna from here and collections immediately below looks overall more like Cincinnatian age material (same interval as Red River and Stony Mountain), but suggests slightly deeper, cooler water than the Red River. I (Blodgett) highly recommend getting more brachiopods from this interval if possible.

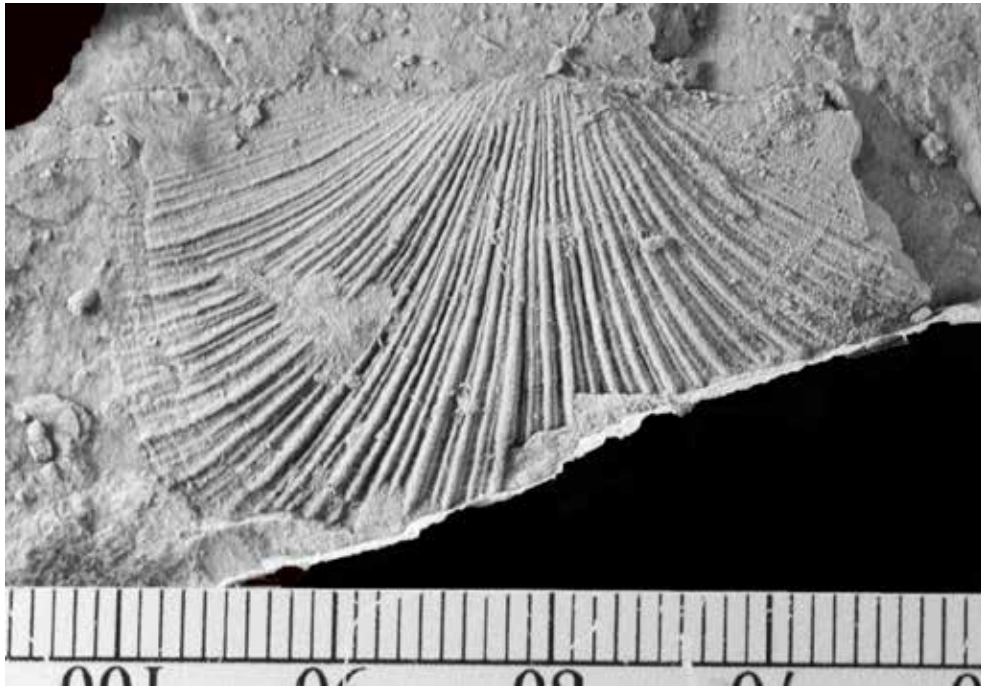
BRACHIOPODA



20RC047-1. *Strophomena* sp., internal mold in color. Scale bar in mm. Probably same species present in locality 20RC045-1.



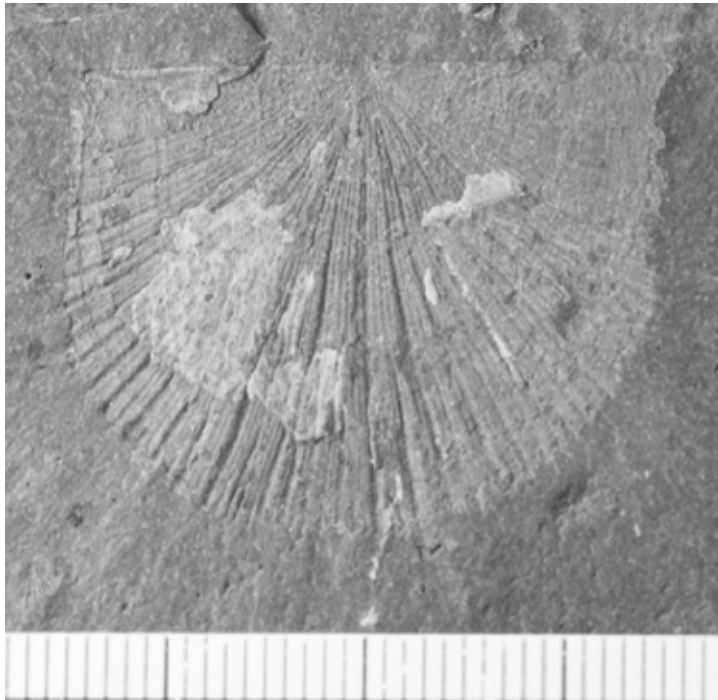
20RC047-1. *Strophomena* sp. 1, internal mold in black and white. Probably same species present at locality 20RC045-1. Scale bar in mm.



20RC047-1. *Strophomena* sp. 1, latex replica of an internal mold. Probably same species present in locality 20RC45. Scale marked in mm.



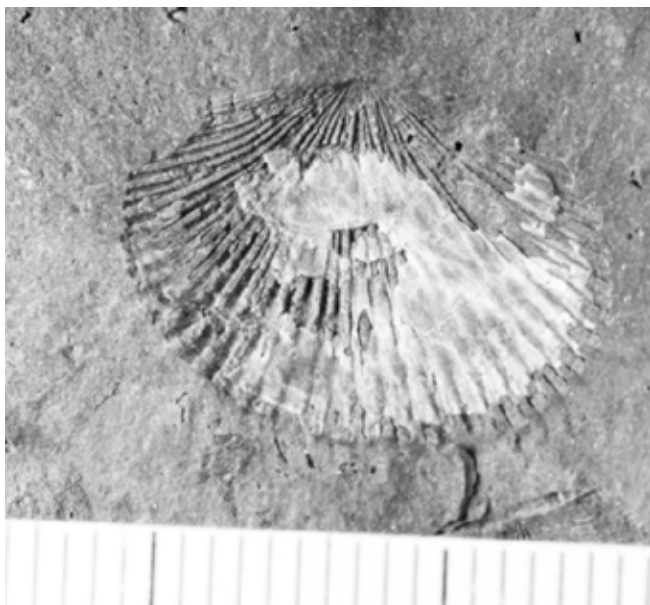
20RC047-1. Strophomena sp. 2, dorsal valve, scale bar marked in mm. Same specimen as color photo immediately above. Jisuo Jin comments (email: Dec. 11, 2020): likely *Strophomena*, if this is a convex dorsal valve.. They do not have the wrinkles in posterior part of the shell, like those in the Red River fauna. They look similar to some *Strophomena* from Cincinnati and the black limestones of the Mackenzie Mountains (no strong wrinkles, stronger ribbing).



20RC047-1. Strophomena sp. 2, dorsal valve, scale bar marked in mm. Same specimen as color photo immediately above. Jisuo Jin comments (email: Dec. 11, 2020): likely *Strophomena*, if this is a convex dorsal valve. They do not have the wrinkles in posterior part of the shell, like those in the Red River fauna. They look similar to some *Strophomena* from Cincinnati and the black limestones of the Mackenzie Mountains (no strong wrinkles, stronger ribbing).



20RC047-1. Either a small *Plaesiomys*, or a dalmanelloid. Dorsal view similar in some respects to *Dinorthis occidentalis* (Okulitch, 1943). Color photo. Scale marked in mm. Jisuo Jin comments (Dec. 11, 2020): Either a small *Plaesiomys*, or a dalmanelloid. With fine costella in the interspace, it may be the latter, although the shell shape looks more like a *Plaesiomys*. These two have been confused in the past (including Twenhofel, 1928), if based on external morphology alone.



20RC047-1. Either a small *Plaesiomys*, or a dalmanelloid. Dorsal view similar in some respects to *Dinorthis occidentalis* (Okulitch, 1943). Color photo. Scale marked in mm. Jisuo Jin comments (Dec. 11, 2020): Either a small *Plaesiomys*, or a dalmanelloid. With fine costella in the interspace, it may be the latter, although the shell shape looks more like

a *Plaesiomys*. These two have been confused in the past (including Twenhofel, 1928), if based on external morphology alone.

20RC074-1

Geologic Unit: Bouvette

Rock Type: Limestone

Lat. 64.516076

Long. -135.125761

Location: Settlemier Creek

Guessed age from YGS spreadsheet: Silurian-Devonian

Paleontological age according to fossils: Silurian or Devonian

Taxa: This coquinoid collection consists solely of a single species of an indeterminate smooth brachiopod. Lack of knowledge of its internal character precludes a more detailed taxonomic assignment. The general morphology of these shells is suggestive of a possible assignment to the family Glassiidae (Silurian-Upper Devonian (Frasnian) or Family Athyrididae (Silurian-Carboniferous). Again, due to lack of detailed knowledge of internal features I can make a more detailed assignment. The shells are mostly articulated, suggestive of little physical post-mortem transport after death.

Age: Silurian to Devonian. To further resolve the age issue here it is recommended to get a much higher taxonomically diverse faunal assemblage next time you are near here. The preservation of the shell material is rather nice, so I have great hope from more refined age definition in case more taxa of differing genera can be found.



20RC074-1. Indeterminate smooth articulated brachiopod #1 embedded in limestone



20RC074-1 Indeterminate smooth brachiopod #2 (articulated specimen), ventral view, scale bar 500 microns



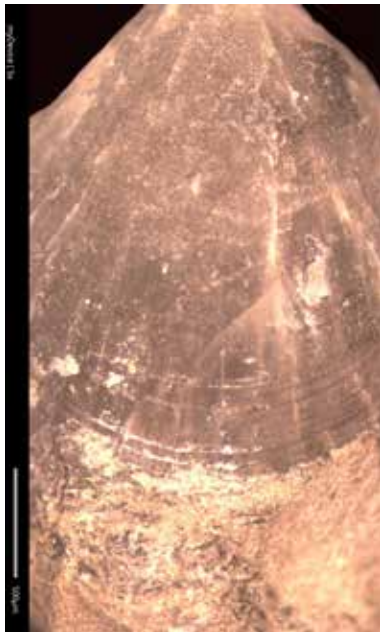
20RC074-1 Indeterminate smooth brachiopod #2 (articulated specimen), dorsal view, scale bar 500 microns.



20RC074-1 Indeterminate smooth brachiopod #2 (articulated specimen), lateral view, scale bar 500 microns.



20RC074-1 Indeterminate smooth brachiopod #2 (articulated specimen), anterior view, scale bar 500 microns



20RC074-1 Indeterminate smooth brachiopod #2 (articulated specimen), enlarged view of ventral valve, note fine growth lines, scale bar 500 microns.

20RC167-1

Geologic Unit: Marmot

Rock Type: Limestone

Lat. 64.366951

Long. -135.42572

Location: Sullivan Hill

Guessed age from YGS spreadsheet: Ordovician?

Taxa: Indeterminate fasciculate rugose coral #3 (too coarsely silicified for proper generic identification).

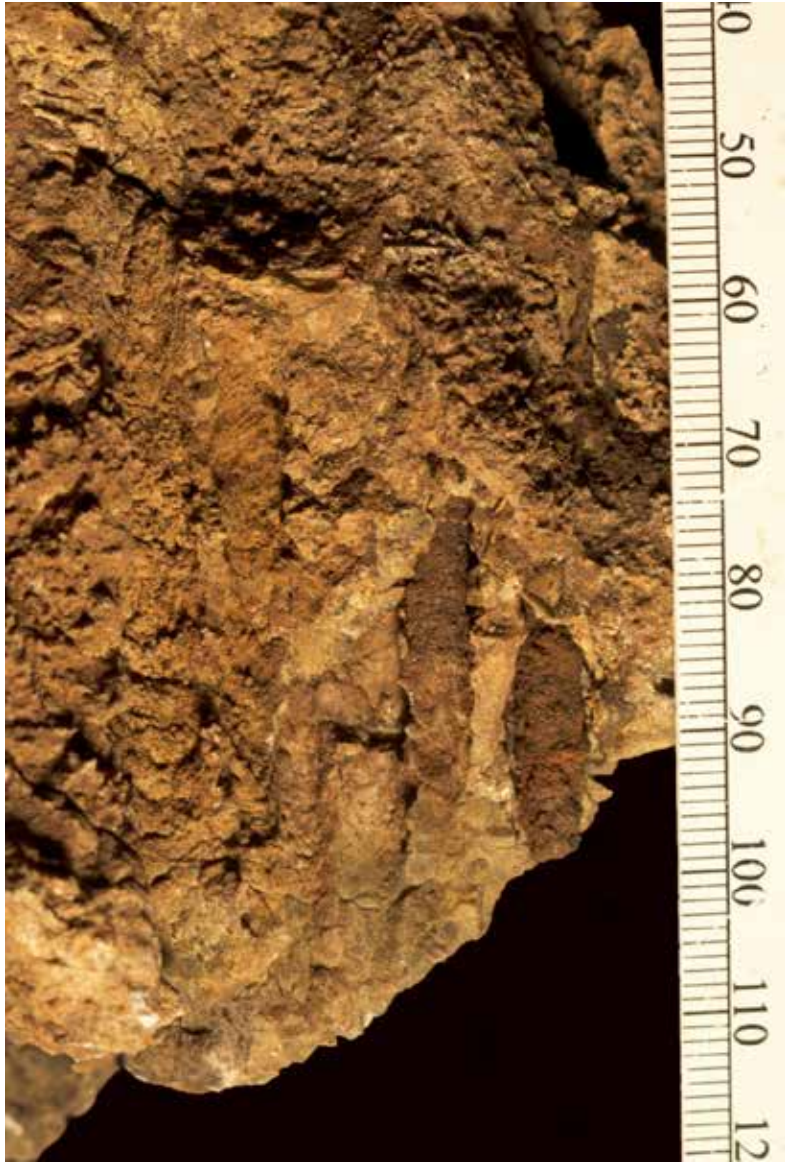
Age: uncertain due to coarse silicification of this fasciculate rugose coral, but probably in Ordovician age.



20RC167-1. Indeterminate fasciculate rugose coral #1 (too coarsely silicified for proper generic identification). Scale bar marked in mm.



20RC167-1. Indeterminate fasciculate rugose coral #2 (too coarsely silicified for proper generic identification). Scale bar marked in mm.



20RC167-1. Indeterminate fasciculate rugose coral #3 (too coarsely silicified for proper generic identification). Scale bar marked in mm.

20RC183-1

Geologic Unit: Earn Group

Rock Type: Late Devonian?

Lat. 61.184466

Long. -128.316193

Location: Conglomerate Creek

Guessed age from YGS spreadsheet: Late Devonian?

Taxa: *Psilophyton* or some related primitive plant genus.

Age: probably Early Devonian, but I have seen similar assemblages less frequently in latest Silurian age strata. It may even possibly be as young as Early Middle Devonian (Eifelian).

Comments: The abundance of this taxon in the shaly host rocks suggests a probably terrestrial quiet-water setting. I have seen one very similar assemblage in Lower Devonian rocks in the Topagoruk #1 well on the North Slope of Alaska.



Psilophyton or some related primitive plant genus. Scale bar marked in mm.



Psilophyton or some related primitive plant genus. Scale bar marked in mm.



Three views of the primitive land plant *Psilophyton* or a closely related genus. Scale bar in mm.

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Hi Robert,

I have attached two strat columns that show the approximate location of the 2020 fossil samples from Castle Mountain area. The color codes between the two documents is consistent so you can see how all the samples correlate with each other. Basically from youngest at the top of the list to oldest at the bottom of the list, the samples sit in this order:

20RC074
20RC008
20RC018/20RC003
20RC044/20RC046/20RC047

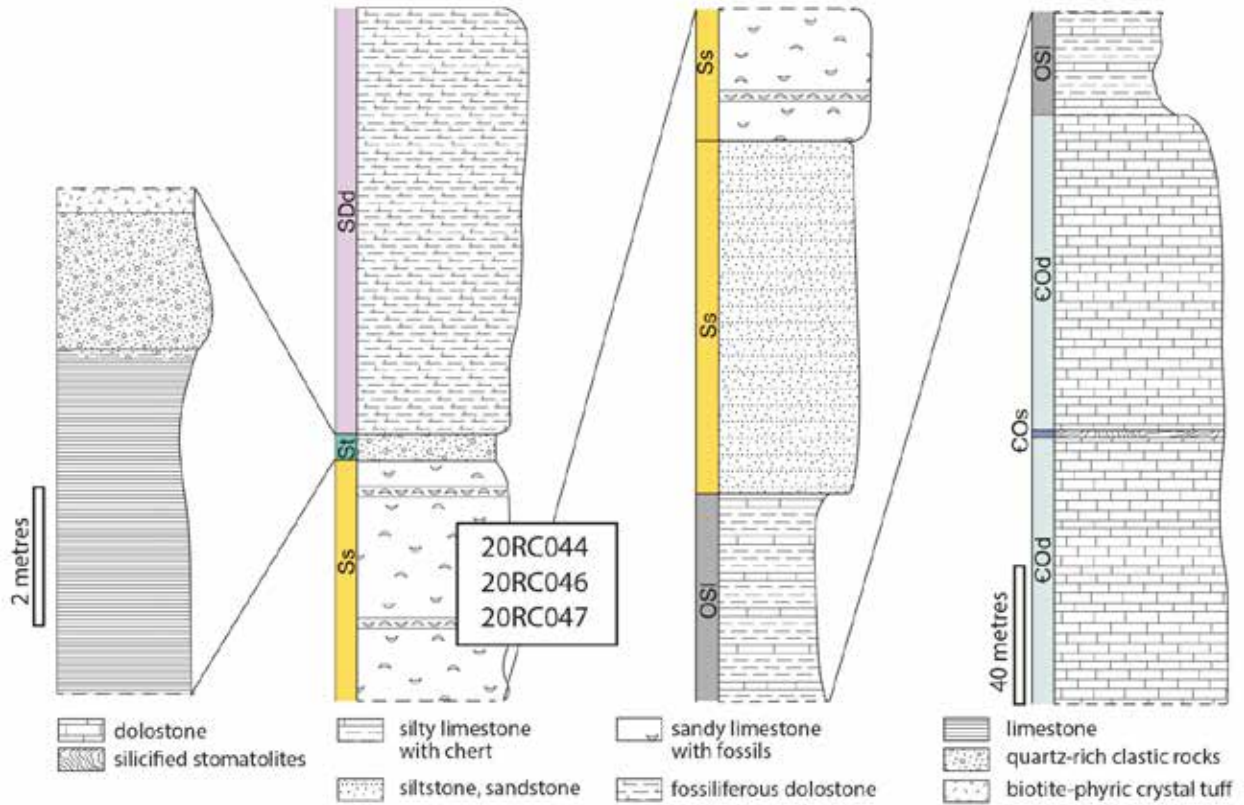
As for the other two, sample 20RC167-1 is from a different area to the south of Castle Mountain in the Selwyn basin. These rocks are of unknown age so any constraints you can give me based on this sample will be helpful.

Sample 20RC183-1 is from southeast Yukon. I think this is an exposure of the Late Devonian Earn Group so am curious what you think of the stick-like fossils.

Looking forward to hearing from you about these samples.

Rosie

STRATIGRAPHIC SECTION WEST – 2020 SAMPLES



STRATIGRAPHIC SECTION EAST – 2020 SAMPLES

Report on Graptolite Samples 20 RC 032-1 and 20 RC 050-2
Collected 2020 by Rosie Cobbett, Yukon Geological Survey

By Michael J. Melchin
Department of Earth Sciences
St. Francis Xavier University
Antigonish, NS, B2G 2W5, Canada

Figure numbers refer to specimens illustrated in the included plate of camera lucida drawings.
Short vertical lines indicate 1 mm scale bar for each specimen.

20 RC 032-1

Orthograptus calcaratus (subspecies indet.) – Figs 1, 2
Climacograptus bicornis – Figs 3-5
Cryptograptus marcidus – Fig. 6
Archiclimacograptus antiquus – Fig. 7
Dicranograptus sp. (possibly *D. brevicaulis*) – Fig. 8
Dicranograptus nicholsoni – Fig. 9

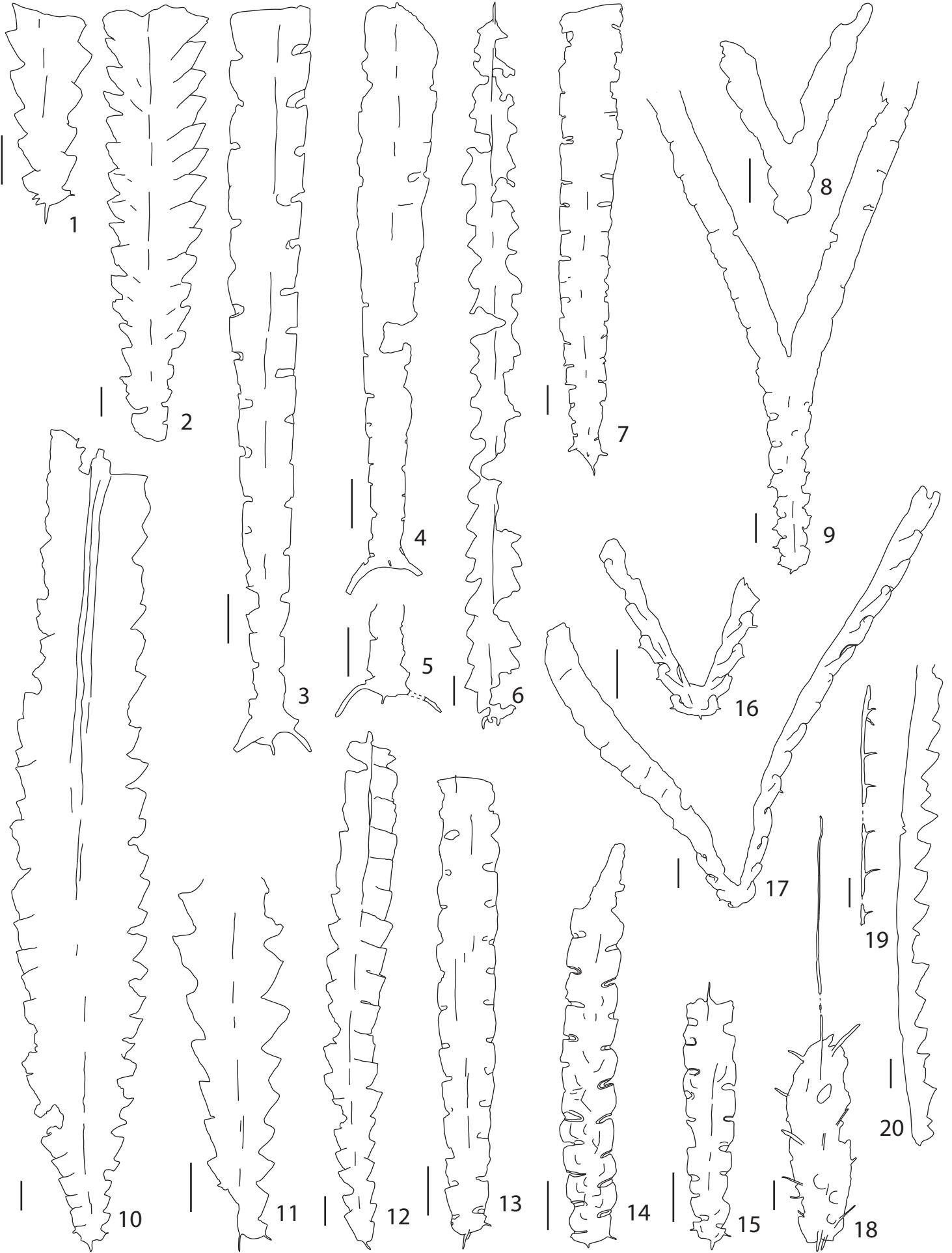
This sample indicates the upper Sandbian *Climacograptus bicornis* Zone (= *Orthograptus calcaratus* Zone). This is indicated by the occurrence of *C. bicornis*, which is elsewhere considered to be restricted to this zone. This is consistent with the overlapping age ranges of all of the other taxa identified in the sample.

20 RC 050-2

Orthograptus expansus – Fig. 10
Orthograptus calcaratus (subspecies indet.) – Fig. 11
Pronormalograptus euglyphus – Fig. 12
Archiclimacograptus meridionalis – Fig. 13
Archiclimacograptus modestus – Figs 13-15
Jianxigraptus gurleyi – Fig. 16
Jiangxigraptus sextans? – Fig. 17
Glossograptus sp. – Fig. 18
Thamnograptus capillaris – Figs 19, 20
Reteograptus sp. – not illustrated

This sample indicates the upper Sandbian *Climacograptus bicornis* Zone (= *Orthograptus calcaratus* Zone). This is indicated by the occurrence of *Orthograptus expansus*, which has been previously reported only from this zone at one other locality in northern Yukon. This is also supported by the overlapping age ranges of the other taxa in this collection.







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PALEONTOLOGICAL REPORT RAPPORT DE PALÉONTOLOGIE

REPORT 4-SAG-2021

**REPORT ON 9 CONODONT SAMPLES FROM A VARIETY OF
PALEOZOIC OUTCROPS IN THE PARAUTOCHTHONOUS
ROCKS OF THE NORTHERN CORDILLERA, YUKON,
SAMPLED AND SUBMITTED BY R. COBBETT, YUKON
GEOLOGICAL SURVEY. NTS 95D, 105C, 106D; CON NO 1835**

S.A. GOUWY

**GEOLOGICAL SURVEY OF CANADA (CALGARY)
COMMISSION GEOLOGIQUE DU CANADA (CALGARY)**

4-SAG-2021

Report on 9 conodont samples from a variety of Paleozoic outcrops in the parautochthonous rocks of the northern Cordillera, Yukon, sampled and submitted by R. Cobbett, Yukon Geological Survey. NTS 95D, 105C, 106D; CON No 1835

Sofie Gouwy

All references to age determinations and paleontological data must quote the authorship of the report, and the unique GSC Curation Number of the fossil collection. If the report is cited in a publication, it should be included in the References Cited section as:

"Gouwy, S.A., 2021. Report on 9 conodont samples from a variety of Paleozoic outcrops in the parautochthonous rocks of the northern Cordillera, Yukon, sampled and submitted by R. Cobbett, Yukon Geological Survey. NTS 95D, 105C, 106D; CON No 1835; Geological Survey of Canada, Paleontological Report 4-SAG-2021, 5 p."

Reference to, or reproduction of, paleontological data and age determinations in publications must be approved by the author of the Paleontological Report prior to manuscript submission. If the author is not available, the Chief Paleontologist, Geological Survey of Canada (Calgary), should be consulted for possible revision.

Substantial use of paleontological and age data in publications should be reflected in the publications' authorship.

Material: 9 rock samples processed completely in the GSC laboratory.

GSC Curation Number: C-637323

Sample 20RC041-2; station 20RC041; latitude 64.540606° N; longitude 135.20811° W; NAD83; NTS 106-D-11. Con. No. 1835-1: Mass in 2245g, out 68g, 97 % breakdown.

Fossils:

Aphelognathus sp. - 2 specimens

Panderodus unicostatus (Branson & Mehl) or *Panderodus gracilis* (Branson & Mehl) - 1 specimen

Pseudobelodina quadrata Sweet 1979 - 1 specimen

Pseudobelodina sp. - 1 specimen

indeterminate ostracodes

Age: Late Ordovician, Edenian – Late Ordovician, Richmondian

Biostratigraphy: *superbus - ordovicus*

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-637324

Sample 20RC043-1; station 20RC043; latitude 64.534965° N; longitude 135.246963° W; NAD83; NTS 106-D-11. Con. No. 1835-2: Mass in 1760g, out 11g, 99.4 % breakdown.

Fossils:

Barren

GSC Curation Number: C-637325

Sample 20RC069-1; station 20RC069; latitude 64.519494° N; longitude 135.174059° W; NAD83; NTS 106-D-11. Con. No. 1835-3: Mass in 1699g, out 0.6g, 100 % breakdown.

Fossils:

Indeterminate coniform element - 3 specimens

Indeterminate ramiform element - 2 specimens

Panderodus unicastatus (Branson & Mehl) or *Panderodus gracilis* (Branson & Mehl) - 1 specimen

Age: Ordovician - Devonian

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-637326

Sample 20RC084-2; station 20RC084; latitude 64.501223° N; longitude 135.127544° W; NAD83; NTS 106-D-11. Con. No. 1835-4: Mass in 2078g, out 22g, 98.9 % breakdown.

Fossils:

indeterminate crinoid ossicles

indeterminate ostracodes

indeterminate sponge spicules

GSC Curation Number: C-637327

Sample 20RC202-1; station 20RC202; latitude 60.484169° N; longitude 127.28585° W; NAD83; NTS 095-D-06. Con. No. 1835-5: Mass in 1507g, out 859g, 43 % breakdown.

Fossils:

Barren

GSC Curation Number: C-637328

Sample 20RC203-1; station 20RC203; latitude 60.483187° N; longitude 127.292009° W; NAD83; NTS 095-D-06. Con. No. 1835-6: Mass in 1672g, out 56g, 96.7 % breakdown.

Fossils:
Barren

GSC Curation Number: C-637329

Sample 20RC206-1; station 20RC206; latitude 60.464242° N; longitude 127.284937° W; NAD83; NTS 095-D-06. Con. No. 1835-7: Mass in 1944g, out 4g, 99.8 % breakdown.

Fossils:
Barren

GSC Curation Number: C-637330

Sample 20DMO-081; station 20DMO-081; latitude 60.939909° N; longitude 133.64868° W; NAD83; NTS 105-C-13. Con. No. 1835-8: Mass in 2521g, out 881g, 65.1 % breakdown.

Fossils:
Barren

GSC Curation Number: C-637331

Sample 20DMO-026; station 20DMO-026; latitude 60.982364° N; longitude 133.86072° W; NAD83; NTS 105-C-13. Con. No. 1835-9: Mass in 1961g, out 997g, 49.2 % breakdown.

Fossils:
Barren

Discussion

Only two of the processed samples contain conodont material, C-637323 (Figure 1) and C-637325. The latter revealed only a small fragment of *Panderodus unicostatus*/*Panderodus gracilis* (fragment is too small to distinguish between these two). The fossil range places this sample within the Ordovician to Devonian interval. Sample C-637323 provides more detailed information. *Pseudobelodina quadratus* has a short range and is present from the middle part of the Edenian to the Richmondian (within *superbus* to *ordovicus* conodont zones interval, Figure 2), delineating the early and middle part of the Late Ordovician.

References

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Figure 1. C-637323: A-B. *Aphelognathus* sp. (Pb-elements) lateral views; C. *Pseudobelodina quadrata* Sweet, lateral view; D. *Panderodus unicostatus* (Branson & Mehl) or *Panderodus gracilis* (Branson & Mehl), lateral view; E. *Pseudobelodina* sp., lateral view.

GEOLOGICAL TIME		CONODONT ZONES	
ORDOVICIAN	LATE	GAMACHIAN	
		RICHMONDIAN	
		MAYSVILLIAN	
	MIDDLE	TRENTONIAN	EDENIAN
			SHERMANIAN
			KIRKFIELDIAN
		ROCKLANDIAN	
		BLACKRIVERAN	
		CHAZYAN	
		WHITEROCKIAN	
E	CANADIAN		

Figure 2. Relevant conodont zones for the Late Ordovician (from McCracken, 2000)

S. Gouwy
 Geological Survey of Canada (Calgary)
 March 24, 2021
 4-SAG-2021.doc

J. Galloway
 Chief Paleontologist GSC (Calgary)



PALEONTOLOGICAL REPORT RAPPORT DE PALÉONTOLOGIE



REPORT 4-SAG-2022

**REPORT ON 17 CONODONT SAMPLES FROM SURFACE
LOCATIONS IN YUKON AND NORTHWEST TERRITORIES
SAMPLED AND SUBMITTED BY ROSIE COBBETT; NTS 95L,
NTS 105I, NTS 105M, NTS106D, NTS 116B; CON. NO. 1848**

S.A. GOUWY, G. NOWLAN, M. GOLDING and M. ORCHARD

**GEOLOGICAL SURVEY OF CANADA (CALGARY)
COMMISSION GEOLOGIQUE DU CANADA (CALGARY)**

4-SAG-2022

Report on 17 conodont samples from surface locations in Yukon and Northwest Territories collected and submitted by Rosie Cobbett. NTS 95L, NTS 105I, NTS 105M, NTS106D, NTS 116B; CON. NO. 1848

**Sofie Gouwy, Godfrey Nowlan, Martyn Golding and
Mike Orchard**

All references to age determinations and paleontological data must quote the authorship of the report, and the unique GSC Curation Number of the fossil collection. If the report is cited in a publication, it should be included in the References Cited section as:

"Gouwy, S.A., Nowlan, G., Golding, M. and Orchard, M., 2022. Report on 17 conodont samples from surface locations in Yukon and Northwest Territories collected and submitted by Rosie Cobbett. NTS 95L, NTS 105I, NTS 105M, NTS106D, NTS 116B; CON. NO. 1848; Geological Survey of Canada, Paleontological Report 4-SAG-2022, 8 p."

Reference to, or reproduction of, paleontological data and age determinations in publications must be approved by the author of the Paleontological Report prior to manuscript submission. If the author is not available, the Chief Paleontologist, Geological Survey of Canada (Calgary), should be consulted for possible revision.

Substantial use of paleontological and age data in publications should be reflected in the publications' authorship.

Material: 17 rock samples processed completely in the GSC laboratory.

GSC Curation Number: C-641954

Sample 21DS-002-1-3 Cordilleran Orogen; station 21DS-002; latitude 64.248791° N; longitude -135.171608° E; NAD83; NTS 106-D-03. Lithology: limestone; Con. No. 1848-1.

Fossils:

Indeterminate conodont fragments - >100 specimens

Mesogondolella arcuata Chernykh 2006- 3 specimens

Mesogondolella dentiseparata (Reshetkova and Chernykh 1986) - 2 specimens

Age: Asselian – Sakmarian (Early Permian)

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-641955

Sample 21RC001-1 Cordilleran Orogen; station 21RC001; latitude 62.310051° N; longitude - 128.189397° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-2.

Fossils:

?*Protopanderodus* sp. – 8 specimen

Age: Early-Middle Ordovician

Thermal: CAI 4 - 4.50.

GSC Curation Number: C-641956

Sample 21RC020-1 Cordilleran Orogen; station 21RC020; latitude 62.307225° N; longitude - 128.173849° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-3.

Fossils:

?*Protopanderodus* sp. - 1 specimen

Age: Early-Middle Ordovician

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-641957

Sample 21RC026-1 Cordilleran Orogen; station 21RC026; latitude 62.291747° N; longitude - 128.185965° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-4.

Fossils:

Barren

GSC Curation Number: C-641958

Sample 21RC027-1 Cordilleran Orogen; station 21RC027; latitude 62.291927° N; longitude - 128.18925° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-5.

Fossils:

Barren

GSC Curation Number: C-641959

Sample 21RC036-1 Cordilleran Orogen; station 21RC036; latitude 62.314848° N; longitude - 128.189307° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-6.

Fossils:
Barren

GSC Curation Number: C-641960

Sample 21RC040-1 Cordilleran Orogen; station 21RC040; latitude 62.315742° N; longitude - 128.200132° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-7.

Fossils:
Barren

GSC Curation Number: C-641961

Sample 21RC058-1 Cordilleran Orogen; station 21RC058; latitude 62.302271° N; longitude - 128.198332° E; NAD83; NTS 105-I-08. Lithology: limestone; Con. No. 1848-8.

Fossils:
Barren

GSC Curation Number: C-641962

Sample 21RC066-1 Cordilleran Orogen; station 21RC066; latitude 62.027053° N; longitude - 127.67873° E; NAD83; NTS 095-L-04. Lithology: limestone; Con. No. 1848-9.

Fossils:
Barren

GSC Curation Number: C-641963

Sample 21RC073-1 Cordilleran Orogen; station 21RC073; latitude 62.029476° N; longitude - 127.683559° E; NAD83; NTS 095-L-04. Lithology: limestone; Con. No. 1848-10.

Fossils:
Cordilodus sp. - 14 specimens
?Eoconodontus sp. (might be *E. notchpeakensis* (Miller 1969))
Inarticulate brachiopod fragments

Age: Late Cambrian

Thermal: CAI 4 - 4.50.

GSC Curation Number: C-641964

Sample 21RC078-1 Cordilleran Orogen; station 21RC078; latitude 62.024859° N; longitude - 127.691043° E; NAD83; NTS 095-L-04. Lithology: limestone; Con. No. 1848-11.

Fossils:
Barren

GSC Curation Number: C-641965

Sample 21RC109-2 Cordilleran Orogen; station 21RC109; latitude 64.42561° N; longitude - 135.156654° E; NAD83; NTS 106-D-06. Lithology: limestone; Con. No. 1848-12.

Fossils:
Barren

GSC Curation Number: C-641966

Sample 21RC146-2 Cordilleran Orogen; station 21RC146; latitude 64.487616° N; longitude - 135.071896° E; NAD83; NTS 106-D-06. Lithology: limestone; Con. No. 1848-13.

Fossils:
Indeterminate conodont fragments - >100 specimens
Periodon flabellum (Lindström 1955) (Sb, Sc, Sa, M and P elements) - 12 specimens
Protopanderodus parvibasis Löfgren 1978 - 1 specimen
Protopanderodus varicostatus (Sweet and Bergström 1962) -1 specimen
Pariostodus originalis (Sergeeva 1963) - 1 specimen

Age: Darriwilian (Middle Ordovician)

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-641967

Sample 21RC145-1 station 21RC145; latitude 64.48382° N; longitude -135.05668° E; NAD83; NTS 106-D-06. Lithology: limestone; Con. No. 1848-14.

Fossils:
Indeterminate conodont fragments - >100 specimens
Periodon flabellum (Lindström 1955) (Sb, Sc, Sa, M and P elements) - 9 specimens
Protopanderodus parvibasis Löfgren 1978 - 1 specimen
Protopanderodus varicostatus (Sweet and Bergström 1962) - 1 specimen
Pariostodus originalis (Sergeeva 1963) - 1 specimen

Age: Darriwilian (Middle Ordovician)

Thermal: CAI 4.50 - 5.

GSC Curation Number: C-641968

Sample 21RC214-1 Cordilleran Orogen; station 21RC214; latitude 64.581041° N; longitude - 139.660296° E; NAD83; NTS 116-B-12. Lithology: limestone; Con. No. 1848-15.

Fossils:

Barren

GSC Curation Number: C-641969

Sample 21RC263-1 Cordilleran Orogen; station 21RC263; latitude 64.651979° N; longitude - 139.284035° E; NAD83; NTS 116-B-11. Lithology: limestone; Con. No. 1848-16.

Fossils:

Barren

GSC Curation Number: C-641970

Sample 21MC-041 Cordilleran Orogen; station 21MC-041; latitude 63.8931967° N; longitude - 135.2786436° E; NAD83; NTS 105-M-14. Lithology: Marble; Con. No. 1848-17.

Fossils:

Barren

Discussion

Only 6 of the 17 processed samples contained conodonts that allowed an age determination. The youngest sample is of Permian age (C-641954) based on the joint occurrence of two species of *Mesogondolella*: *Mesogondolella arcuata* Chernykh and *Mesogondolella dentiseparata* (Reshetkova and Chernykh). The quadrate posterior, arched platform, prominent cusp, separated posterior denticles and a relatively low, moderately fused blade are typical for *M. arcuata* (Fig. 2 A,B); the more rounded posterior platforms in the sample are more indicative of *M. dentiseparata* (Fig. 2 C,D).

Two samples (C-641966 and C-641967) contain similar faunas that places them in the Darriwilian (Middle Ordovician). In both samples, the conodont specimens are very fragmented (more in C-641967). For the species *Periodon flabellum*, elements from different positions in the conodont apparatus could be identified (Sa, Sb, Sc, M and P) (Fig. 1G). Based on their shape these elements are called oistodiform elements (G1) and multiramiform elements (G2). In each sample, at least one symmetrical acodontiform specimen with the typical shorter oral margin and more shallow basal cavity (Löfgren, 1978) of *Protopanderodus parvibasis* (Fig 1, H) and an acodontiform specimen with the typical lateral costae (Löfgren, 1978) of *Protopanderodus varicostatus* (Fig. 1 I) were identified. The former of these specimens is limited to the Darriwilian (Llanvirn) (McCracken, 1989), the latter also occurs in the late part of the Arenig and the early part of the Llandeilo (McCracken, 1989). A specimen of ?*Protopanderodus* sp. is identified in two samples (C-641955 and C-641956) indicating the age of the sample as Early-

Middle Ordovician, which is the range of the *Protopanderodus* genus (McCracken, 1989). The oldest conodont sample in the batch is C-641963, identified as Late Cambrian based on the occurrence of *Cordilodus* and *Eoconodontus* specimens (*Eoconodontus notchpeakensis* is restricted to the Late Cambrian, (Miller, 1969)), *Cordilodus* and other *Eoconodontus* species can also occur in the Ordovician (Miller, 1980).

References

Löfgren, A. 1978. Arenigian and Llanvirnian conodonts from Jamtland, northern Sweden. *Fossils and Strata*, 13: 129pp.

McCracken, A. D., 1989. *Protopanderodus* (Conodonts) from the Ordovician Road River Group, Northern Yukon Territory and the evolution of the genus. *Geological Survey of Canada, Bulletin* 338: 39pp.

Miller, J.F., 1969. Conodont fauna of the Notch Peak limestone (Cambro-Ordovician), House Range, Utah. *Journal of Paleontology*, vol 43 (2): 413-439.

Miller, J.F., 1980. Taxonomic revisions of some Upper Cambrian and Lower Ordovician conodonts with comments of their evolution. *The University of Kansas Paleontological Contributions, Paper* 99: 39pp.

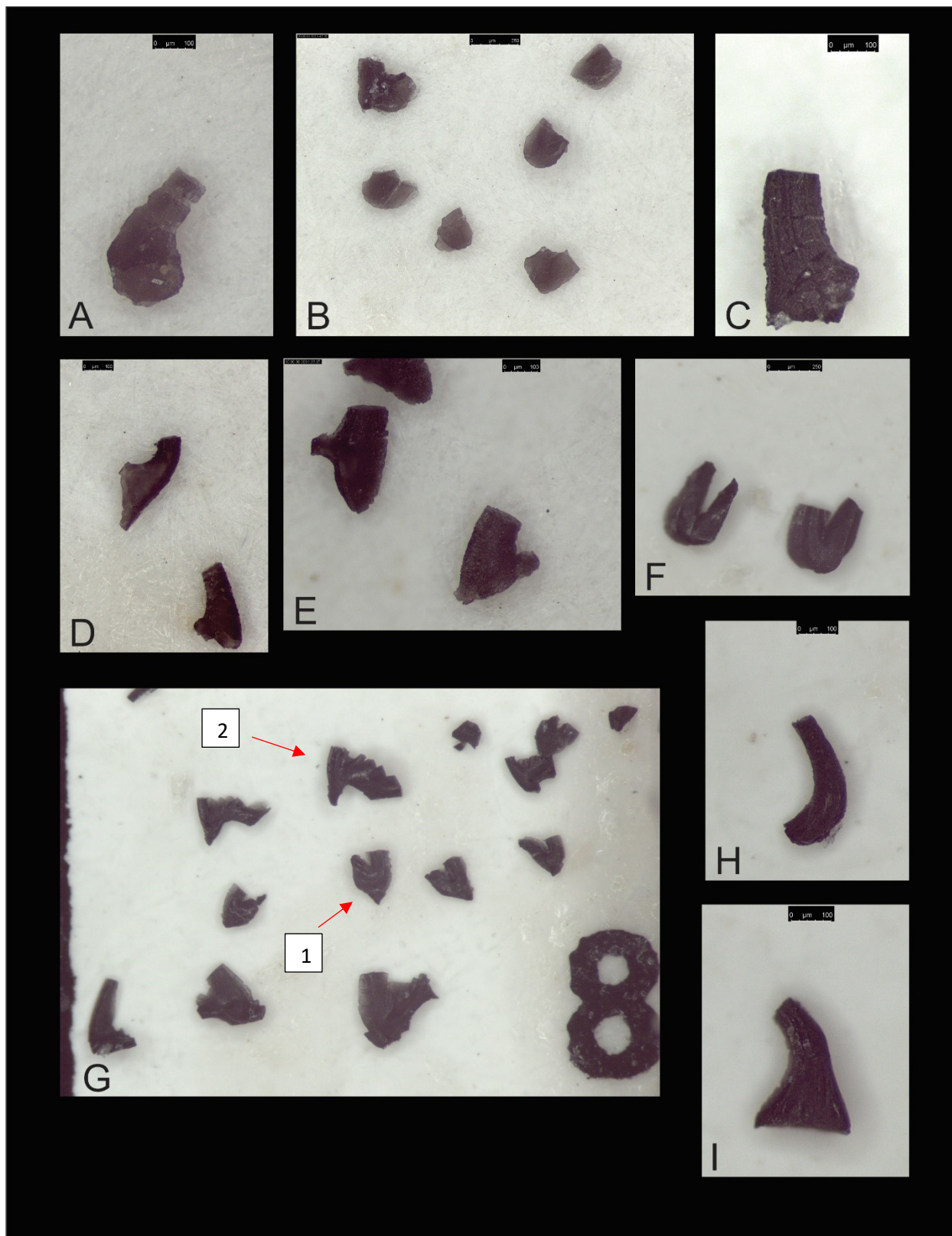


Figure 1. Cambrian-Ordovician conodonts. A: *?Protopanderodus* sp., C-641955; B: *?Protopanderodus* sp., C-641955; C: *?Protopanderodus* sp., C-641956; D: *Cordylodus* sp., C-

641963; E: *Eoconodontus* sp., C-641963; F: *Paroistodus originalis*, C-641966; G: *Periodon flabellum*, C-641966; H: *Protopanderodus parvibasis*, C-641966; I: *Protopanderodus varicostatus*, C-641966.

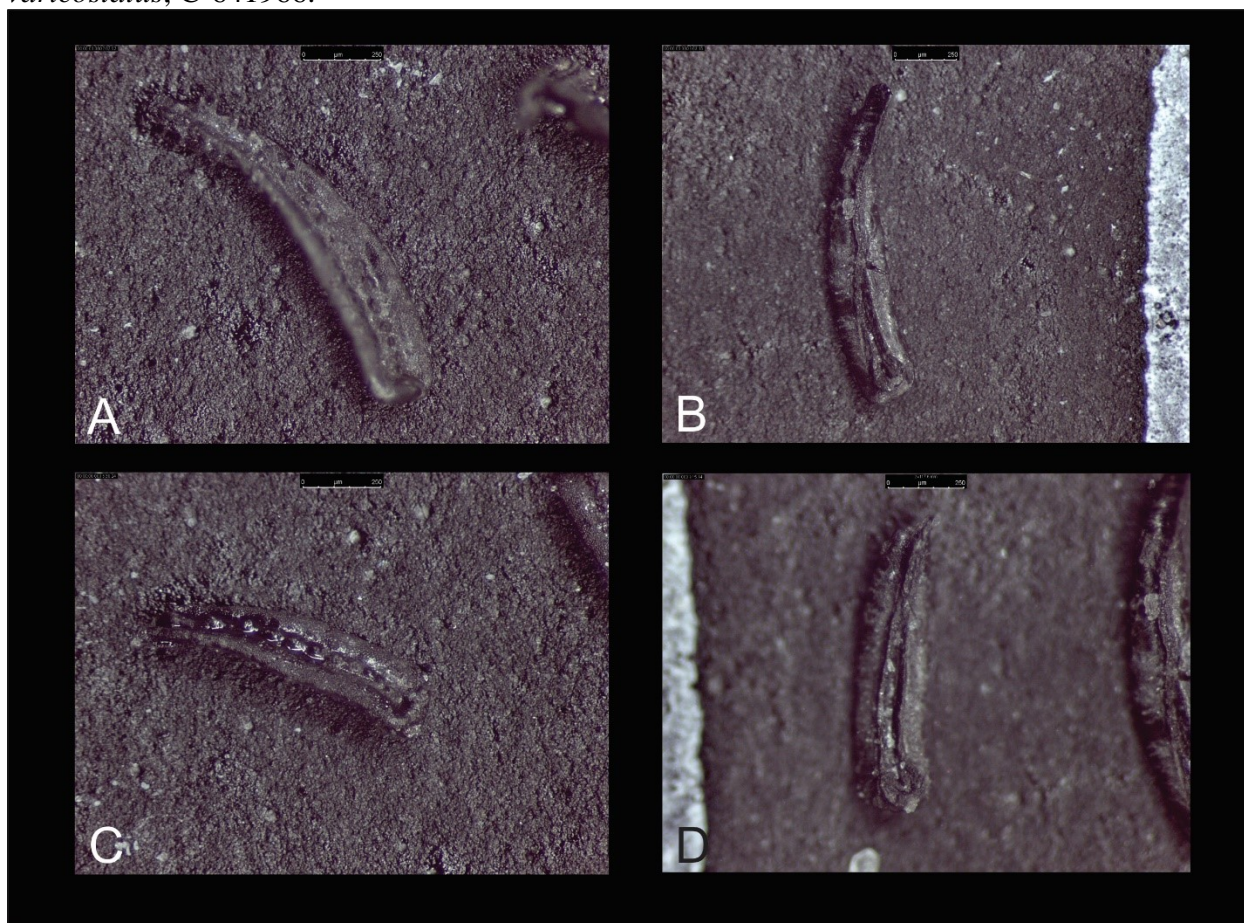


Figure 2. Permian conodonts. A, B: *Mesogondolella arcuata*, upper and lower view, C-641954; C, D: *Mesogondolella dentiseparata*, upper and lower view, C-641954.

S. Gouwy
Geological Survey of Canada (Calgary)
May 25, 2022
4-SAG-2022

J. Galloway
Chief Paleontologist GSC (Calgary)

Report on Graptolite Samples 22 RC 123-2 and 22RC071-1
Collected 2022 by Rosie Cobbett, Yukon Geological Survey

February 15, 2023

By Michael J. Melchin, PhD
St. Francis Xavier University
Antigonish, NS, B2G 2W5, Canada

Figure numbers refer to specimens illustrated in the included figure of camera lucida drawings. Short vertical lines indicate 1 mm scale bar for each specimen.

22 RC 123-2

Torquigraptus planus – Fig. 1A
Spirograptus guerichi – Fig. 1B
Oktavites contortus – Fig. 1C
Monograptus marri – Fig. 1D
Parapetalolithus globosus – Fig. 1E
Streptograptus sp. – not illustrated
Torquigraptus cf. *obtusus* – not illustrated
Stimulograptus sedgwickii or *S. halli* – not illustrated
Pristiograptus cf. *xuishanensis* – not illustrated
Pristiograptus cf. *bjerringus* – not illustrated
Glyptograptus cf. *auritus* – not illustrated

The co-occurrence of the species in this sample clearly indicates the lowest Telychian (upper Llandovery) *Spirograptus guerichi* Biozone. Based on the previous work by Lenz (1982) on the Llandovery graptolites of Yukon, this would be the lower part of the *turriculatus* Biozone. Note that there are few slight revisions to some of the identifications that I sent you recently but nothing that affects the age of the sample or the ID of the key index species.

22 RC 071-1

As noted in an earlier message there are a large number of small fossils in this sample, but I could not find any graptolites. There are, however, very large numbers of tentaculites. I already sent some photos of this material. What I do know is that in Yukon tentaculites, especially the thin-walled dacryoconarids, proliferate the Lower and Middle Devonian shales. I think they are most common (often abundant) Pragian and Emsian strata, so this is mostly likely the age of this sample, although it could be a bit older or younger as well.



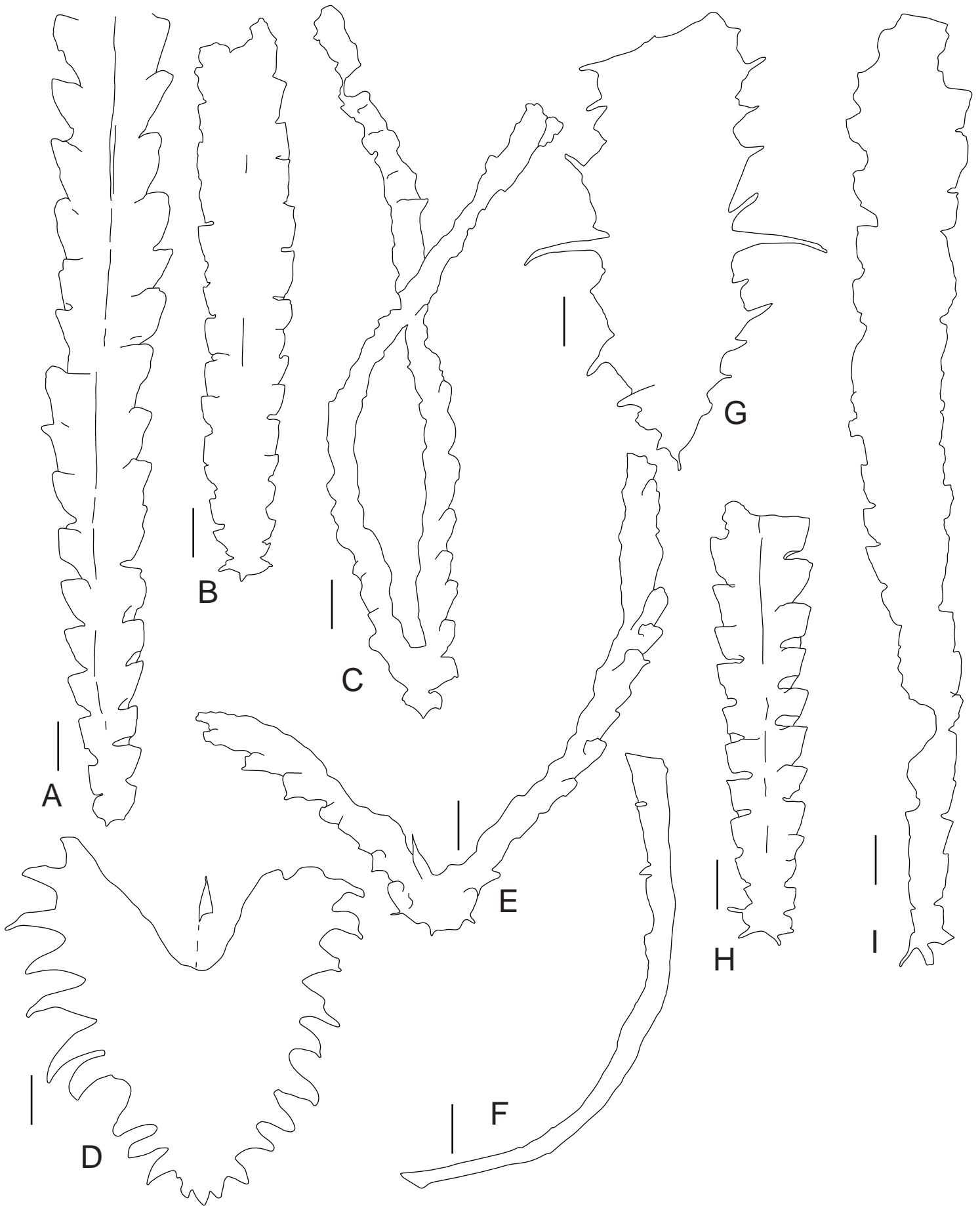


Figure 1

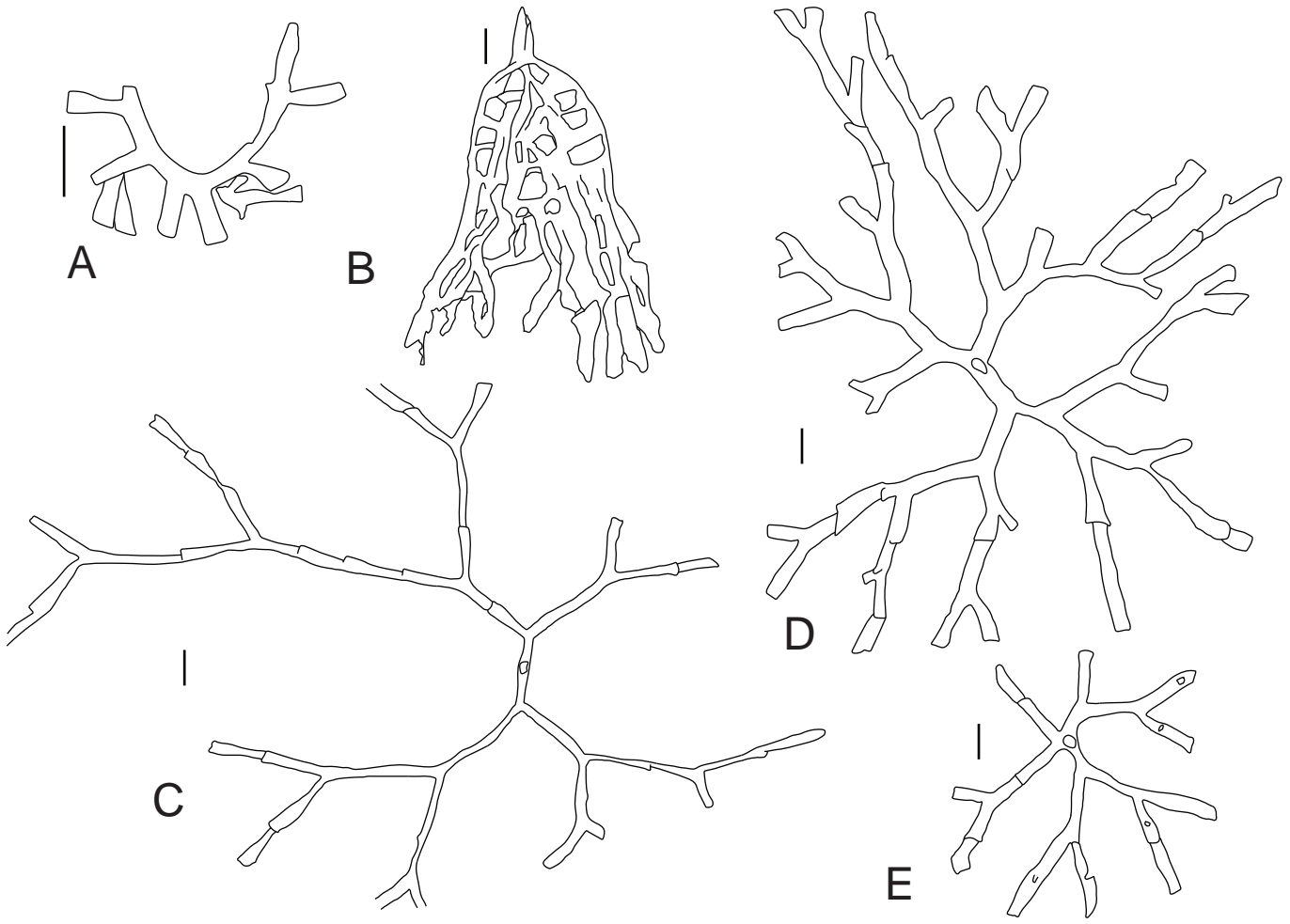
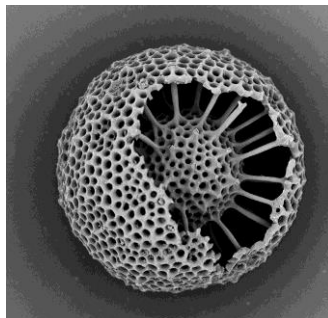


Figure 2

REPORT ON MICROFOSSILS
No. YGS2022-1



Fieldwork 2021

Submission from Rosie COBBETT
Yukon Geological Survey

6 samples

NB : ages are provided in standard stratigraphic subdivisions (periods, epochs and stages). A conversion to absolute ages can be made using the International Chronostratigraphic Chart 2021 published by the International Commission on Stratigraphy on page 2 of the report.

Fabrice Cordey

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07 February 2022

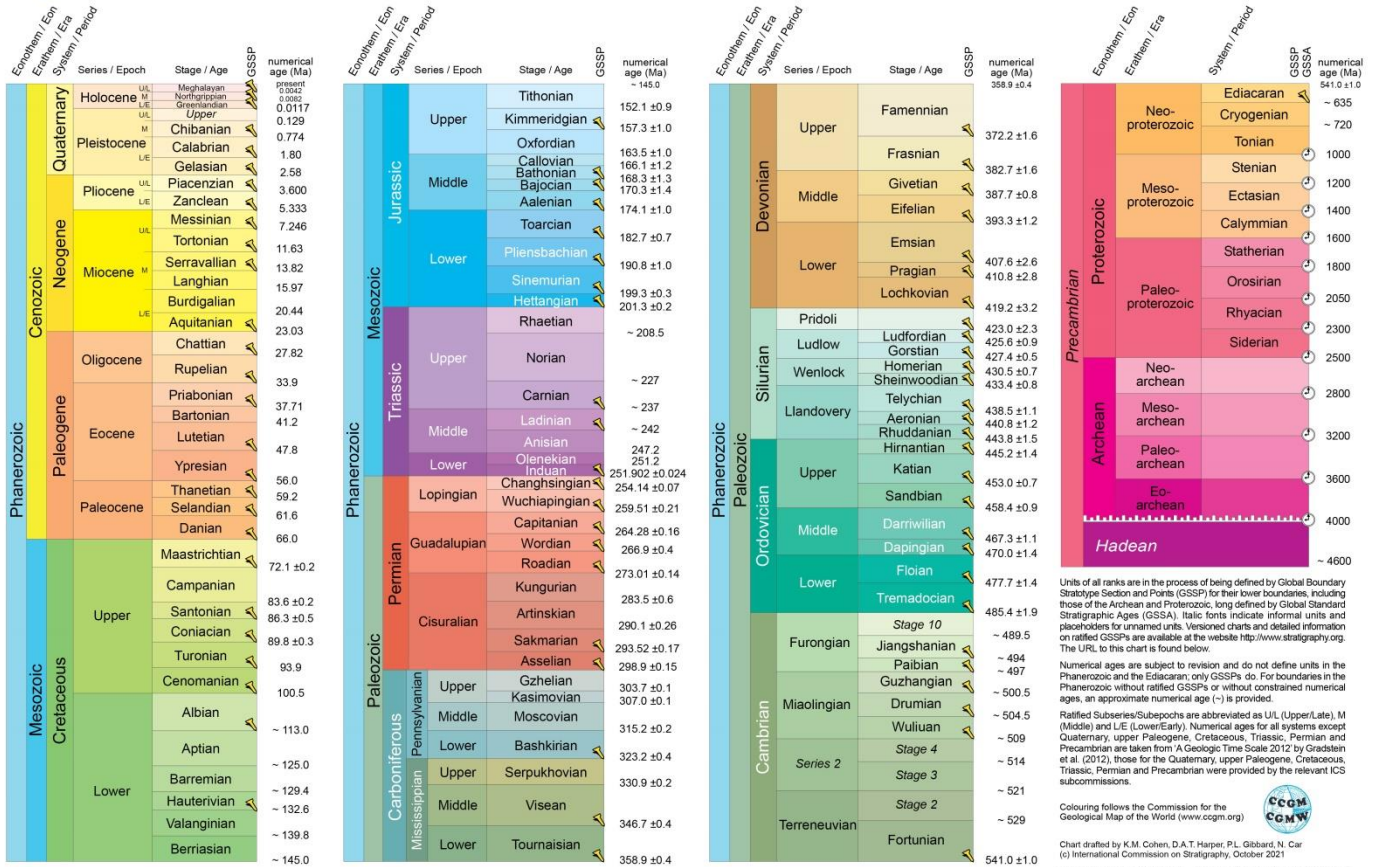


INTERNATIONAL CHRONOSTRATIGRAPHIC CHART

www.stratigraphy.org

International Commission on Stratigraphy

v 2021/10



Units of all ranks are in the process of being defined by Global Boundary Stratotype Section and Points (GSSP) for their lower boundaries, including those of the Archean and Proterozoic, long defined by Global Standard Stratigraphic Ages (GSSA). Italic fonts indicate informal units and placeholders for unnamed units. Versioned charts and detailed information on ratified GSSPs are available at the website <http://www.stratigraphy.org>. The URL to this chart is found below.

Numerical ages are subject to revision and do not define units in the Phanerozoic and the Ediacaran; only GSSPs do. For boundaries in the Phanerozoic without ratified GSSPs or without constrained numerical ages, an approximate numerical age (-) is provided.

Ratified Subseries/Subepochs are abbreviated as U/L (Upper/Late), M (Middle) and L/E (Lower/Early). Numerical ages for all systems except Quaternary, upper Paleogene, Cretaceous, Permian and Precambrian are taken from 'A Geologic Time Scale 2012' by Gradstein et al. (2012), those for the Quaternary, upper Paleogene, Cretaceous, Triassic, Permian and Precambrian were provided by the relevant ICS subcommissions.

Colouring follows the Commission for the Geological Map of the World (www.ccgw.org)

Chart drafted by K.M. Cohen, D.A.T. Harper, P.L. Gibbard, N. Car (c) International Commission on Stratigraphy, October 2021

To cite: Cohen, K.M., Finney, S.C., Gibbard, P.L. & Fan, J.-X. (2013), updated) The ICS International Chronostratigraphic Chart. Episodes 36: 199-204.

URL: <http://www.stratigraphy.org/ICSChart/ChronostratChart2021-10.pdf>

SAMPLE: 21RC 205-1

Geologist: Rosie Cobbett

Locality and coordinates: 64.573455; -139.64359

Assigned geological unit: "Road River"

Location: Fifteen Mile River

Potential age if applic.: "Early Ordovician"

Lithology: chert

Occurrence of radiolarians: confirmed

Preservation: poor

Radiolarian taxa:

- *Inanigutta* sp.

- ? *Involuentactinia* sp.

- ? *Maletzella* sp.

Other: rare sponge spicules, rare pyrite crystals

Age: **Ordovician-Silurian (Florian-Pridoli)**

Comments: age is based on the range of *Inanigutta*. The two genera *Involuentactinia* and *Maletzella* are known in the lower Silurian, but they occurrence is not confirmed due to rather poor preservation.

SAMPLE: 21RC 237-1

Geologist: Rosie Cobbett

Locality and coordinates: 64.645905; -139.197563

Assigned geological unit: "Road River"

Location: Fifteen Mile River

Potential age if applic.: "Early Ordovician"

Lithology: chert

Occurrence of radiolarians: confirmed

Preservation: moderate

Radiolarian taxa:

- *Inanigutta* sp.

- *Secuicollacta* sp.

- *Zadrappolus* sp.

Other: sponge spicules (hexactinellids), rare pyrite crystals

Age: **middle-late Silurian (Wenlock-Ludlow)**

Comments: the sample is younger than expected: it contains several specimens of *Secuicollacta* which is "late Ordovician-late Silurian (Katian-Ludlow)". The co-occurrence of *Secuicollacta* (Katian-Ludlow) and *Zadrappolus* (Wenlock-Pridoli) leads to a more precise age of middle-late Silurian (Wenlock-Ludlow).

SAMPLE: 21RC 255-2

Geologist: Rosie Cobbett

Locality and coordinates: 64.646858; -139.248419

Assigned geological unit: "Road River"

Location: Fifteen Mile River

Potential age if applic.: "Early Ordovician"

Lithology: chert

Occurrence of radiolarians: confirmed

Preservation: poor

Radiolarian taxa:

- *Secuicollacta* sp.

Other: sponge spicules, rare pyritized radiolarians

Age: **late Ordovician-late Silurian (Katian-Ludlow)**

Comments: Abundant fauna with many forms with cylindrical spines typical of Early Paleozoic periods. Unfortunately the spheres surfaces are not well-preserved and prevent further identifications, other than *Secuicollacta* (2 specimens).

SAMPLE: 21DS-027-1-2

Geologist: Diane Skipton

Locality and coordinates: 64.268117; -135.1858

Assigned geological unit: "?"

Location: Nash Creek Area

Potential age if applic.: "Late Ordovician to Silurian?"

Lithology: chert bed in limestone

Occurrence of radiolarians: confirmed

Preservation: poor

Radiolarian taxa: recrystallized sphaeromorphs (non diagnostic)

Other: - 1 conodont: SEM pictures made in Lyon, sent to M. Orchard which sent his call below:
neogondolellid (*Mesogondolella*?)

Age: **Permian-Triassic (possibly Early-Middle Permian)**

Comments (M. Orchard): the sample is not Lower Paleozoic as suggested. A very conservative and safer call would be a 'neogondolellid' conodont of probable Permian-Triassic age. A braver call might be: possibly *Mesogondolella*? of Early - Middle Permian age.

SAMPLE: 21DS-081-1-1

Geologist: Diane Skipton

Locality and coordinates: 64.316538; -135.040955

Assigned geological unit: "Elmer Lake?"

Location: Nash Creek Area

Potential age if applic.: "Middle Cambrian to Silurian?"

Lithology: siliceous mudstone with secondary silicification; schistosity

Occurrence of radiolarians: confirmed

Preservation: poor

Radiolarian taxa: sphaeromorphs (non diagnostic)

Other: silica fragments, pyrite

Age: **indeterminate**

Comments: preservation too poor for identifications

SAMPLE: 21DS-154-2-1

Geologist: Diane Skipton

Locality and coordinates: 64.22734; -135.274954

Assigned geological unit: "Earn Group"

Location: Nash Creek Area

Potential age if applic.: "Devonian to Mississippian"

Lithology: chert bed in contact with gabbro

Occurrence of radiolarians: not confirmed

Preservation: /

Radiolarian taxa: /

Other: silica fragments

Age: **indeterminate**

Comments: chert too recrystallized for microfossil preservation