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**GEOLOGICAL
SURVEY
OF
CANADA**

DEPARTMENT OF ENERGY,
MINES AND RESOURCES

PAPER 72-38



**BIOSTRATIGRAPHIC DETERMINATIONS OF
FOSSILS FROM THE SUBSURFACE OF THE
YUKON TERRITORY AND THE DISTRICTS
OF FRANKLIN, KEEWATIN AND MACKENZIE**

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**B.S. Norford, W.W. Brideaux, T.P. Chamney, M. J. Copeland,
Hans Frebold, William S. Hopkins, Jr., J.A. Jeletzky, B. Johnson,
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(Report and 1 figure)

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Price: \$1.50

Catalogue No. M44-72-38

Price subject to change without notice

Information Canada

Ottawa

1973

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ABSTRACT

Identifications and age determinations are presented for fossils from twenty-six wells in the Yukon Territory and the Districts of Franklin, Keewatin and Mackenzie. Ages range from Ordovician to Tertiary and are based on identifications of spores, pollen, dinoflagellates, acritarchs, conodonts, foraminifers, corals, gastropods, cephalopods, pelecypods and brachiopods.

RÉSUMÉ

Les auteurs donnent les identifications et l'âge des fossiles provenant de vingt-six puits du territoire de Yukon and des districts de Franklin, de Keewatin et de Mackenzie. L'âge des fossiles s'étend de l'Ordovicien au Tertiaire et est déterminé par les études des spores, des pollen, des dinoflagellés, des acritarches, des conodontes, des foraminifères, des coraux, des gastropodes, des cephalopodes, des pélecypodes et des brachiopodes.

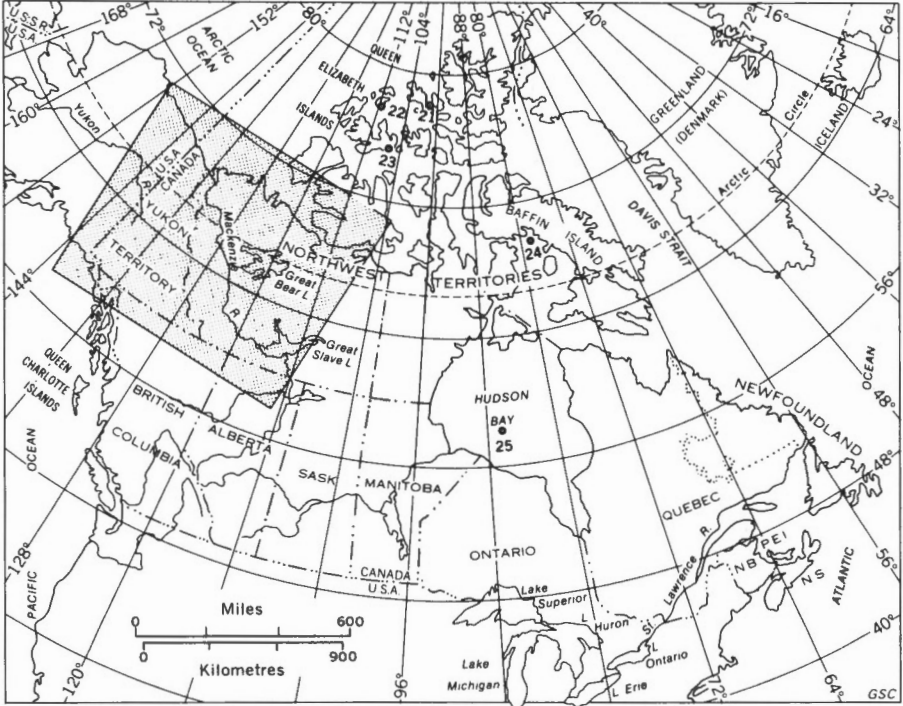


Figure 1a. Locality map, shaded area shown in more detail in figure 1b

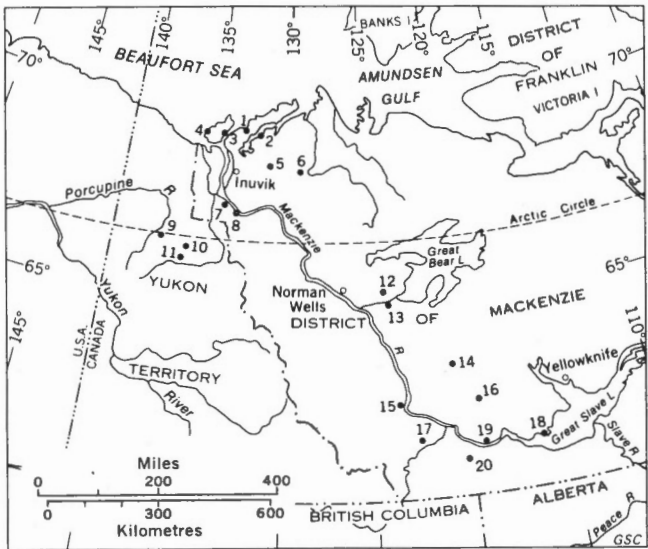


Figure 1b. Locality map, Yukon Territory and adjacent District of Mackenzie

BIOSTRATIGRAPHIC DETERMINATIONS OF FOSSILS FROM
THE SUBSURFACE OF THE YUKON TERRITORY AND THE
DISTRICTS OF FRANKLIN, KEEWATIN AND MACKENZIE

INTRODUCTION

The assimilation of information obtained from wells drilled in northern Canada is of prime importance to the continuing exploration of the petroleum resources of the region. Biostratigraphic dating of rocks penetrated by wells allows precise correlation of strata with rock units in other wells and with outcropping formations. It provides important age control for reconstructions of the structural configuration of the subsurface rocks and of the patterns of sedimentation during geological time.

Where possible, the fossiliferous intervals in the wells have been assigned to formations. G.R. Davies, W.S. MacKenzie, N.C. Meijer-Drees, A.W. Norris, A.E.H. Pedder, K.J. Roy, H.P. Trettin, G.K. Williams, C.J. Yorath and F.G. Young of the Institute of Sedimentary and Petroleum Geology, Calgary, are responsible for these assignments. The stratigraphic frameworks have not yet been established for the intervals reported in the remaining wells, and formational assignments are not possible. The fossils are stored in the collections of the Geological Survey of Canada in Calgary.

The information in this paper has been used by stratigraphers of the Institute of Sedimentary and Petroleum Geology in research on the subsurface geology of northern Canada, part of which has been abstracted to appear in editions of the Schedule of Wells published by the Department of Indian Affairs and Northern Development. Atlantic Richfield Canada Limited kindly permitted studies conducted by B. Johnson to be included in the present publication.

The paper has been compiled by B.S. Norford; similar ones have been published by the Geological Survey of Canada as Papers 70-15 and 71-15.

WELLS STUDIED AND SHOWN ON FIGURES 1a AND 1b

<u>Locality</u>	<u>Well Name</u>	<u>Year Completed</u>	<u>Ages Reported</u>	<u>Author</u>
1	I.O.E. Tuk F-18	1969	Cretaceous	Brideaux
2	I.O.E. Eskimo J-07	1969	Cretaceous	Hopkins
3	B.A. Shell I.O.E. Reindeer D-27	1966	Cretaceous	Chamney

Manuscript received: June 29, 1972
Compiler's address: Institute of Sedimentary and Petroleum Geology
3303 - 33 Street N.W.
Calgary, Alberta T2L 2A7

<u>Locality</u>	<u>Well Name</u>	<u>Year Completed</u>	<u>Ages Reported</u>	<u>Author</u>
4	I.O.E. Ellice 0-14	1970	Tertiary	Brideaux
5	C.P.O.G. Kugaluk N-02	1969	Silurian	Norford
6	C.P.O.G. Crossley Lake S. K-60	1969	Devonian	Pedder
7	Richfield <u>et al.</u> Pt. Separation No. 1	1960	Silurian	Norford
8	I.N.C. Attoe Lake I-06	1969	Devonian	Pedder
9	Peel Plateau Eagle Plain YT No. 1	1958	Ordovician-Silurian	Norford
10	Socony Mobil W.M. Ellen YT C-24	1965	Upper Paleozoic	Chamney
11	Socony Mobil W.M. Birch YT B-34	1965	Cretaceous	Chamney
12	Sinclair Whitefish River K-76	1969	Cretaceous	Chamney-Johnson
13	Sinclair Wolverine Creek D-61	1969	Cretaceous	Chamney-Johnson
14	Imperial Cartridge F-72	1960	Devonian	Uyeno
15	F.P.C. Tenneco Root River I-60	1963	Ordovician	Norford
16	Chevron Hornell Lake G-24	1969	Cretaceous	Chamney
17	Husky <u>et al.</u> Sibbeston G-69	1970	Devonian	Pedder
18	N.W.T. Deep Bay No. 2	1952	Devonian	Chamney
19	Gulf <u>et al.</u> Redknife H-28	1970	Devonian	Pedder
20	Gulf <u>et al.</u> Trout River D-14	1970	Devonian	Pedder
21	Panarctic Hoodoo Dome H-37	1970	Jurassic	Frebold-Jeletzky
22	Elf Cape Norem A-80	1970	Triassic	Tozer
23	Panarctic Sandy Point L-46	1969	Triassic	Tozer
24	Panarctic Towson Point F-63	1970	Devonian	Copeland-Norford-Norris
25	Aquitaine <u>et al.</u> Rowley M-04	1971	Ordovician	Norford
26	Aquitaine Hudson Walrus A-71	1969	Silurian-Devonian	McGregor-Pedder-Uyeno

CORRELATIONS AND IDENTIFICATIONS OF FOSSILS

Cretaceous and Tertiary Assemblages (Palynomorphs) by W.W. Brideaux

I.O.E. Ellice 0-14

69°03'56"N., 135°48'16"W., figure 1a, loc. 4

Depth 780-784 ft., core,
GSC loc. C-12654

Taxodiaceapollenites spp.
Pinus spp.
Corylus spp.
Myricaceae spp.
Betulaceoipollenites spp.
Periporopollenites cf. *P. stigmus*
(Potonié) Thomson and Pflug
Ulmipollenites sp.
Pterocarya sp.
Bombacacidites sp.
various tricolporate pollen grains
age: Tertiary, Oligocene-Miocene.

- Depth 1,791-1,794 ft., core,
GSC loc. C-12656
- various chorate dinoflagellate cysts
Hystriosphera spp.
Cannosphaeropsis sp.
Tiliaepollenites sp.
Alnipollenites verus Potonié
bisaccate pollen grains
Wetzeliella sp.
various tricolporate pollen grains
Nyssapollenites sp.
Sapotaceoidaepollenites spp.
Caryapollenites spp.
Carpinipites sp.
Corylus cf. *C. tripollenites* Rouse
Alnipollenites verus Potonié
Ulmipollenites sp.
Ilexpollenites sp.
Pistillipollenites macgregorii Rouse
derived Cretaceous forms:
Aquilapollenites sp.
Scriniodinium sp.
Oligosphaeridium sp.
Cyathidites sp.
Alisporites spp.
Appendicisporites sp.
age: Tertiary, pre-Miocene, Eocene-
?Oligocene. Derived Early and Late
Cretaceous and perhaps ?Paleocene-
Eocene spore and pollen and dino-
flagellate species are present.
- Depth 2,890-2,896 ft., core,
GSC loc. C-12658
- Tiliaepollenites crassipites* Wodehouse
Pterocaryapollenites spp.
Caryapollenites sp.
Betulaepollenites sp.
Carpinipites sp.
Taxodiaceapollenites sp.
various tricolporate pollen grains
derived Cretaceous:
Aquilapollenites spp.
A. parallelus B.D. Tschudy
various bisaccate grains
derived Late Permian-Early Triassic:
various striate bisaccate grains
age: Tertiary, ?Eocene.
- Depth 3,927-3,930 ft., core,
Reindeer Formation,
GSC loc. C-12659
- Betulaceoipollenites* sp.
Taxodiaceapollenites sp.
various poorly preserved dinoflagellate
cysts, possibly derived
derived bisaccate pollen grains
derived Early Cretaceous species:
Cyathidites sp.
Klukisporites sp.
Oligosphaeridium sp.
Canningia cf. *C. colliveri* Cookson
and Eisenack
Tenua hystrix Eisenack
age: inconclusive, post-Senonian or
Early Tertiary (Paleocene).

- Depth 3,943-3,947 ft., core,
Reindeer Formation,
GSC loc. C-12660
- Hystriichosphaera ramosa* (White) Davey and
Williams
Cleistosphaeridium sp.
Tiliaepollenites? sp.
Taxodiaceapollenites sp.
Triporopollenites spp.
Sphagnum (*Stereisporites*) *regnium* Drozhastichich
derived Cretaceous and Paleozoic species
age: post-Senonian to Early Paleocene.
- Depth 4,850-4,851 ft., core,
GSC loc. C-12661
- Sequoiapollenites* spp.
Sphagnum (*Stereisporites*) *regnium* Drozhastichich
Laevigatosporites ovatus Wilson and Webster
Triporopollenites sp.
Betulaceoipollenites sp.
Taxodiaceapollenites sp.
various bisaccate pollen
derived Early Cretaceous species
age: Maestrichtian to ?Early Paleocene.
- Depth 6,280-6,284 ft., core,
GSC loc. C-12662
- Aquilapollenites* spp.
Sequoiapollenites spp.
Stereisporites sp.
Taxodiaceapollenites sp.
rare trilete spores
derived Cretaceous and Late Permian-Early
Triassic species.
age: Campanian?-Maestrichtian.
- Depth 6,304-6,308 ft., core,
GSC loc. C-12664
- Hystriichosphaera ramosa* (White) Davey and
Williams
Aquilapollenites spp.
Lycopodiumsporites sp.
Osmundacidites sp.
Taxodiaceapollenites sp.
rare, poorly preserved triporate pollen grains
derived Early Cretaceous and Late Permian-
Early Triassic species
age: inconclusive, likely Late Cretaceous,
post-Santonian, pre-Paleocene.
- Depth 6,790-6,791 ft., core,
Moose Channel Formation,
GSC loc. C-12665
- Aquilapollenites* sp.
Triporopollenites sp.
poorly preserved bisaccates, likely derived
in part
poorly preserved rare triporate spp.
derived Paleozoic and Late Permian-Early
Triassic species
age: inconclusive, likely Late Cretaceous,
post-Santonian, pre-Paleocene.
- Depth 7,873 ft., core,
Moose Channel Formation,
GSC loc. C-12667
- Triporopollenites* sp.
Taxodiaceapollenites sp.
rare bisaccates, likely derived
age: inconclusive, likely Late Cretaceous.
- Depth 7,892 ft., core,
Moose Channel Formation
GSC loc. C-12669
- Betulaceoipollenites* sp.
Triporopollenites sp.
age: Late Cretaceous, likely post-
Senonian.

Depth 7,911-7,913 ft., core, *Dicodinium* sp.
Moose Channel Formation, *Cleistosphaeridium* sp.
GSC loc. C-12675 *Podocarpidites* sp.
Aquilapollenites sp.
Triporopollenites spp.
Betulaceoipollenites sp.
age: Late Cretaceous, post-Senonian.

Depth 8,873 ft., core, no diagnostic palynomorphs
GSC loc. C-12678 age: indeterminate.

Depth 9,484-9,486 ft., core, barren of palynomorphs
GSC loc. C-12680 age: indeterminate.

Depth 9,519-9,523 ft., core, *Scriniodinium* sp. (derived?)
GSC loc. C-12683 no diagnostic palynomorphs
age: indeterminate.

Comments: The higher assemblages are relatively diverse and their Tertiary age can be determined with some confidence. However, cores taken below 3,250 feet with depth become progressively less diverse in species and progressively poorer in specimen numbers. Locality C-12661 (Maestrichtian to ?Early Paleocene), at 4,850-4,851 feet yields the only assemblage that may be correlated with assemblages recovered from outcrop in this vicinity. Samples below this interval provide only inconclusive data for age determination.

The coarse fraction of all samples contains abundant plant material of various types, in various states of preservation. This material becomes progressively more carbonized downhole until a dark brown colour is reached in cores 10 to 12, GSC localities C-12678 (8,873 feet), C-12680 (9,484-6 feet) and C-12683 (9,519-23 feet). Abundant derived material is present in all samples, but tends to decrease in abundance and variety downhole, especially below 6,791 feet. Late Paleozoic (Carboniferous), Late Permian-Early Triassic, Cretaceous and possibly Early Paleogene (Paleocene-Eocene) species occur in various samples.

I.O.E. Tuk F-18
69°17'29"N., 133°04'01"W., figure 1a, loc. 1

Depth 1,960-2,000 ft., *Inaperturopollenites* sp.
cuttings, GSC loc. C-11500 *Tricolporites* sp.
cuticular fragments
gymnospermous tracheid fragments.
age: probably Late Cretaceous.

Depth 3,750 ft., cuttings, *Neoraistrickia truncata* (Cookson) Potonié
GSC loc. C-11508 *Reticulisporites* cf. *R. elongatus* Singh
Inaperturopollenites hiatus (Potonié)
Thomson and Pflug
triporate pollen grains
age: Cretaceous, possibly Late Cretaceous.

Depth 7,250 ft., cuttings, *Alisporites bilateralis* Rouse
GSC loc. C-11513 *Deflandrea victoriensis* Cookson and Eisenack
Lycopodiumsporites sp.
Inaperturopollenites sp.
Abietinaepollenites sp.
age: Cretaceous, possibly Senonian.

Depth 8,190-8,210 ft.,
cuttings, GSC loc. C-11514

Deflandrea cf. *D. echinoidea* Cookson and Eisenack
D. cf. *D. belfastensis* Cookson and Eisenack
D. spp.
Odontochitina operculata (Wetzel) Deflandre
Cleistosphaeridium sp.
Podocarpidites sp.
age: Cretaceous, possibly Senonian.

Comments: The sample at 1,960-2,000 feet yielded only one specimen of a trilobate grain; the sample at 3,750 feet yielded several trilete spore species whose ranges extend at least into the Cenomanian (earliest Late Cretaceous) and two specimens of triporate angiosperm pollen. Contamination from caving is a possibility, and this, together with the lack of control in other barren cuttings samples, makes assessment of the results difficult.

Cretaceous Assemblages by W.S. Hopkins Jr.

I.O.E. Eskimo J-07

69°16'43"N., 132°30'59"W., figure 1a, loc. 2 (note Tertiary spores identified by Hopkins *in* Norford *et al.*, 1972)

Depth 1,460-1,470 ft.,
cuttings, GSC loc. C-10950

Laevigatosporites sp.
Deltoidospora sp.
?Inaperturopollenites sp.
cf. *Pinus* sp.
Podocarpus sp.
cf. *Triporites* sp.
age: probably Late Cretaceous.

Comments: The sample yielded very few and very poorly preserved palynomorphs. The general degree of preservation and rather intense carbonization suggest a Cretaceous age, while the probable presence of *Triporites* would indicate Late Cretaceous.

Cretaceous Assemblages (Foraminifera and associated microfaunas)
by T.P. Chamney and B. Johnson (Atlantic Richfield Canada, Limited)

Sinclair Whitefish River K-76

65°35'32"N., 124°29'16"W., figure 1a, loc. 12

Depth 380 ft., cuttings,
GSC loc. C-12204

wood fragments
vertebrate (fish) bone
siliceous spheres
gastropods
Haplophragmoides sp.
H. cf. *H. spissus* Stelck and
Wall
spore cases, including barrel-shaped spore
case of *Microcarppolithes* type
age: Both *Haplophragmoides spissus*
(late middle Albian) and
Microcarppolithes are of Albian
age. Lithological data suggest
occurrence of Pleistocene deposits
at this horizon; these include
reworked Cretaceous material.

Depth 990 ft., cuttings,
GSC loc. C-12207

Miliammina aff. *M. bisobscura* Stelck and
Wall (badly preserved)
discoid radiolarian (preserved in pyrite)
age: *Miliammina bisobscura* is a Cretaceous
form.

environment: The recovery is so poor that
interpretations are hazardous. The
presence of a radiolarian signifies
that this area must have had access to
open marine conditions. *Miliammina*
was a bottom dwelling form.

Depth 1,180 ft., cuttings,
GSC loc. C-12209

iron-stained *Inoceramus* calcite prisms
?Haplophragmoides sp. (pyritized)
wood fragments (pyritized)

age: "*Inoceramus*" fragments are of Mesozoic
age, and in the N.W.T. usually are
indicative of Cretaceous.

environment: *Inoceramus* is a marine pelecypod.
The high iron content in the water
indicated by the shell staining and
pyritization could suggest poor circula-
tion, probably in the close proximity
of a land mass.

Depth 1,260 ft., cuttings,
GSC loc. C-12210

Inoceramus prisms (abundant)
wood fragments and plant rootlets (pyritized)
Haplophragmoides sp.
H. ex gr. H. gigas minor Cushman
Reophax sp.

minerals: "salt hoppers" (halite molds filled
calcite) and a milky white botrioidal
form of selenite as a pseudomorph of
certain Tertiary rotalids, having a
flattened/concave pseudoventral side
and a convex pseudodorsal (spiral)
surface.

age: Early Cretaceous, middle or late
Albian.

environment: *Inoceramus* is indicative of
marine conditions. The "salt hoppers"
and pyrite suggest that there were
stagnant conditions in the bottom
waters; the *Haplophragmoides* indicate
that better circulation probably
existed at shallower depths.

Depth 1,360 ft., cuttings,
GSC loc. C-12211

Inoceramus prisms
megaspores
Haplophragmoides, 3 or more spp. (including
dwarf forms)

Ammobaculites sp.

Hyperammina sp.

Trochammina sp.

Gaudryina sp. (short stubby)

Verneuilinoides sp.

Bathysiphon cf. *B. brosegi* Tappan

?Reophax sp.

?Verneuilina sp.

minerals: flood of glauconite, few pyrite nodules.
age: Albian, probably middle Albian.
environment: the high proportion of dwarf
Haplophragmoides species, the tubular
Hyperammina sp. and the pyrite are
indicative of a restricted marine
environment.

Depth 1,560 ft., cuttings,
GSC loc. C-12212

Inoceramus prisms
wood fragments
Reophax sp.
Textularia sp.
Haplophragmoides ex gr. *H. spissus* Stelck and
Wall
?Trochammina sp.
Ammobaculites sp.
?Proteonina sp.
Haplophragmoides aff. *H. linki* Nauss
H. cf. *H. globosa* Lozo
H. ex gr. *H. multiplus* Stelck and Wall
?Trochamminoides n. sp.
minerals: pyrite, but no glauconite.
age: Cretaceous.
environment: the high proportion of dwarf
Haplophragmoides species are indicative
of restricted marine environment,
probably shallow.

Depth 1,660 ft., cuttings,
GSC loc. C-12213

wood fragments
spore
?Trochammina sp.
Ammobaculites fragmentarius Cushman
Haplophragmoides, 2 or more spp.
Gaudryina sp.
G. sp. (short stubby)
?Dorothia sp.
Reophax aff. *R. subfusiformis* Earland
Verneuilina sp.
Anmodiscus cf. *A. mangusi* Tappan
age: middle Albian.
environment: the abundance and variety of
both simple and complex agglutinated
Foraminifera suggest the sample was
formed in a marine environment, probably
near shore and close to a good food
supply. The lack of *Inoceramus* prisms
and wood fragments is surprising, but
may be attributable to tidal current
winnowing.

Depth 1,750 ft., cuttings,
GSC loc. C-12214

Reophax sp.
R. aff. *R. troyeri* Tappan
Proteonina sp.
Bathysiphon sp.
Ammobaculites aff. *A. wenonahae* Tappan
A. fragmentarius Cushman (stubby form)
Gaudryina aff. *G. subcretacea* Cushman
?Trochammina sp.
Glomospirella sp.

Spiroplectammina aff. *S. ammovitrea* Tappan
Haplophragmoides ex gr. *H. spissus* Stelck and Wall

H. aff. *H. laeusleri* Lloyd

H. ex gr. *H. globosa* Lozo

H. aff. *H. neocomianus* Chapman

H. sp.

age: middle Albian.

environment: the abundance of forms, especially the fine-grained, complex, arenaceous Foraminifera indicates a marine environment rich in nutrients though the dwarf nature of the *Haplophragmoides* and *Ammobaculites* present suggests some degree of restriction.

Depth 1,940 ft., cuttings,
GSC loc. C-12215

megaspores

vertebrate, teeth and bone fragments

pyritized wood fragments

Ammobaculites fragmentarius Cushman

?*Verneuilinoides* sp.

Gaudryina sp. (short stubby)

Reophax, 3 or more spp.

Haplophragmoides paralius Skolnick

?*Saccammina lathrami* Tappan

Bathysiphon brosgel Tappan

Haplophragmoides ex gr. *H. gigas minor* Cushman

H. ex gr. *H. collyra* Nauss

Dictyometra sp. 9 of Chamney (1971), characteristically preserved in pyrite

age: the highest stratigraphic appearance of *Dictyometra* sp. 9 in the well samples and the presence of *A. fragmentarius* and *S. lathrami* are good indications of middle Albian.

environment: the presence of radiolaria in the sample means this area must have had access to open marine conditions. The variety and number of Foraminifera also indicate marine conditions. There has been a good deal of pyritization of wood fragments, plant rootlets and faecal pellets. This, combined with the very coarse-grained nature of the agglutinated forms, suggests that the bottom waters were almost certainly more restricted than the surface waters. The presence of wood and spores suggests that a land mass was fairly close.

Depth 2,130 ft., cuttings,
GSC loc. C-12216

Reophax sp.

Bathysiphon sp.

Ammobaculites cf. *A. wenonahae* Tappan

Gaudryina sp. (short stubby)

Verneuilina sp.

Trochammina aff. *T. rainwateri* Cushman and Applin

Lituotuba sp.

Haplophragmoides aff. *H. inflata* Gauger

H. aff. H. spissus Stelck and Wall

Trochamminoides sp.

age: middle Albian.

environment: the abundance and variety of forms indicates open marine conditions. The coiled nature of the *Lituotuba* suggests that the waters were active; this may indicate that the area was near the mouth of a large river which also brought in good food supplies.

Depth 2,310 ft., cuttings,
GSC loc. C-12217

wood fragments

Reophax sp.

R. cf. R. troyeri Tappan

Ammobaculites fragmentarius Tappan (stubby forms)

Saccamina cf. *S. lathrami* Tappan

Trochammina cf. *T. rutherfordi* Stelck and Wall

?*T. rainwateri* Cushman and Applin

Gaudryina sp.

?*Hippocrepina* sp.

Verneuilina sp.

Glomospirella sp.

Psammionopelta bowsheri Tappan

minerals: pyrite and orange-red metallic mineral (may be from the drilling equipment).

age: early middle Albian or late early Albian.

environment: the abundance and number of forms indicate marine conditions, some dwarf forms exist - so the bottom waters may well have been more restricted. Wood fragments suggest land may have been close (probably with a river maintaining a good food supply in this area).

Depth 2,550 ft., cuttings,
GSC loc. C-12218

Gaudryina nanushukensis Tappan

Hippocrepina sp.

Haplophragmoides ex gr. *H. gigas minor* Nauss

H. aff. H. platus Loeblich

H. multiplus Stelck and Wall

Textularia aff. *T. gravenor* Stelck and Wall

T. aff. T. topagorukensis Tappan

?*Verneuilinoides* sp.

?*Miliammina* sp.

?*Trochammina* sp.

Bathysiphon sp.

minerals: amorphous pyrite (abundant).

age: early middle Albian or early Albian.

environment: the dwarf nature of the Foraminifera and the large quantities of pyrite suggest that this deposit formed under toxic conditions. There does not appear to have been any freshening of the sea water (absence of megaspores) from fluvial or deltaic sources (total lack of wood fragments).

- Depth 2,570 ft., cuttings,
GSC loc. C-12219
- This is a poor microfossil sample containing only *Inoceramus* prism (may be contamination), wood fragments
Haplophragmoides sp. indet.
pyritized sphere (showing faint traces of suturing)
minerals: pyrite and a "bornite-like" mineral.
age: indeterminate.
environment: may have been very restricted near shore.
- Depth 2,590 ft., cuttings,
GSC loc. C-12220
- carbonaceous fragments
pyritized organic material (worm tubes)
Trochammina sp.
Haplophragmoides sp.
H. coahuilaensis Conkin and Conkin
H. aff. H. duoflatis Chamney
H. gigas minor Nauss
minerals: pyrite.
age: early Albian.
environment: marine, probably restricted.
- Depth 2,610 ft., cuttings,
GSC loc. C-12221
- faecal pellets (pyritized)
Haplophragmoides sp.
H. coahuilaensis Conkin and Conkin
age: probably early Albian.
environment: marine, probably restricted.
- Depth 2,620 ft., cuttings,
GSC loc. C-12222
- pyritized wood fragments
worm tubes
vertebrate bone fragments
Haplophragmoides ex gr. *H. gigas minor* Nauss
?Reophax sp.
Ammobaculites sp.
age: Early Cretaceous, probably early Albian.
environment: restricted marine conditions suggested, probably near land.
- Depth 2,660 ft., cuttings,
GSC loc. C-12223
- brachiopod spines (?productid)
protistid spheres
vertebrate bone fragments
?wood fragments (pyritized)
Haplophragmoides aff. *H. neocomianus* var.
scallopensis Chapman
?Tritaxis sp.
?Gaudryina sp.
?charophyte
minerals: pyrite.
age: a mixture of Cretaceous and Paleozoic forms (probably Devonian). The Cretaceous material may represent contamination.
environment: the basal Cretaceous was probably restricted marine to brackish. The Devonian material appears to represent marine conditions, close to land.
- Depth 2,690 ft., cuttings,
Bear Rock Formation,
GSC loc. C-12224
- Ammobaculoides* sp.
age: *Ammobaculoides* is a Cretaceous form and the single specimen almost certainly represents contamination.
environment: indeterminate.

Sinclair Wolverine Creek D-61

65°10'14"N., 124°12'52"W., figure 1a, loc. 13

Depth 420 ft., cuttings,
GSC loc. C-12195

radiolarian(?)
Reophax aff. *R. troyeri* Tappan
Gaudryina nanushuckensis Tappan
Ammobaculites fragmentarius Cushman
? *Trochammina* sp.
Trochamminoides sp.
? *Textularia* sp.
minerals: pyrite and calcite debris.
age: middle Albian.
environment: the complexity of the agglutinated
Foraminifera indicates that this is a
marine assemblage which may have had
access to open marine conditions.

Depth 910 ft., cuttings,
GSC loc. C-12196

Spiroplectammina sp.
Reophax aff. *R. minuta* Tappan
R. troyeri Tappan
? *Textularia* sp.
Ammobaculites fragmentarius Cushman
Gaudryina sp. (stubby form)
G. nanushuckensis Tappan
? *Trochamminoides* sp.
Bathysiphon vitta Nauss
Saccammina sp.
? *Ammobaculites* sp.
? *Lagenammina* sp.
? *Trochammina* sp.
Trochammina aff. *T. umiatensis* Tappan
T. aff. *T. ribstonensis* Wickenden
Verneuilinoides sp.
Haplophragmoides sp.
H. ex gr. *H. gigas minor* Nauss
H. ex gr. *H. multiplus* Stelck and Wall
H. gigas minor Nauss
H. aff. *H. sewellensis* Olsson
H. aff. *H. platus* Loeblich
minerals: pyrite.
age: middle Albian.
environment: the abundance and variety of
the fauna indicate that this must have
been a favourable marine environment.

Depth 1,520 ft., cuttings,
GSC loc. C-12197

vertebrate fragments
pyritized wood fragments
spherical (?) radiolaria
Reophax aff. *R. minuta* Tappan
R. undescribed sp. aff. *R. eckermex* Vieaux
Lenticulina cf. *L. macrodisca* Reuss
? *Hippocrepina* sp.
Bathysiphon vitta Nauss
Trochammina sp.
Gaudryina sp.
Clavulina? sp.
Bathysiphon brosegi Tappan
Arenobulimira paynei Tappan
Lagenammina sp.

?*Lagenammina* undescribed sp.
Discorbis stictata Tappan
Haplophragmoides spp.
H. gigas minor Nauss
H. aff. H. cucullatus Gallitelli
H. cf. H. globosa Lozo
H. aff. H. ex gr. Linki Nauss
H. ex gr. H. gigas minor Nauss
Trochamminoides sp.

minerals: pyrite.

age: middle Albian.

environment: the abundance and the variety of fauna indicate a favourable marine environment and the presence of radiolaria and a pseudo-pelagic calcareous Foraminifera suggests that there must have been access to open marine conditions. The pyritized wood fragments indicate that a land mass may have been close. This might suggest that there was a large river bringing into the sea a good supply of nutrients capable of supporting such a rich faunal assemblage.

Depth 1,810 ft., cuttings,
GSC loc. C-12198

megaspores

wood fragments

Reophax aff. R. minuta Tappan

R. cf. R. troyeri Tappan

Textularia topagorukensis Tappan

Spiroplectammina sp.

Bathysiphon brosegi Tappan

Ammodiscus aff. A. rotalarius Loeblich and Tappan

?*Ammodiscus* sp.

?*Lagena* sp.

Ammobaculites fragmentarius Cushman

Lagenammina sp.

Proteonina sp.

Trochamminoides spp.

Trochammina sp.

?*Trochammina* sp.

Haplophragmoides aff. H. barremicus Myatliuk

H. ex gr. H. gigas minor Nauss

H. ex gr. H. linki Nauss

H. aff. H. tryssa Loeblich and Tappan

H. gigas minor Nauss

?*Haplophragmoides* undescribed sp.

H. aff. H. cushmani Loeblich and Tappan

age: middle Albian.

environment: the variety and number of specimens indicate that this is a marine sample, however there are fewer open marine indicators than at 1,520 feet, and the fauna as a whole appears to be decreasing in size. There is a corresponding increase in the amount of wood material and megaspores, so it seems probable that this was a restricted marine, near-shore sample.

Depth 2,430 ft., cuttings,
GSC loc. C-12199

pyritized faecal material
gastropod and wood fragments
Gaudryina subcretacea Cushman
G. nanushuckensis Tappan
? *Gaudryina* cf. *G. tailleuri* Tappan
Bathysiphon aff. *B. borosgei* Tappan
Amodiscus aff. *A. mangusi* Tappan
Ammobaculites fragmentarius Cushman (stubby forms).
? *Glomospirella* sp.
? *G.* aff. *G. gaultina* Berthelin
Reophax aff. *R. troyeri* Tappan
? *Hyperammina* sp.
Saccammina lathrami Tappan
? *Trochammina* sp.
Neobulimina subcretacea Cushman
Haplophragmoides gigas minor Nauss
H. ex gr. *H. gigas minor* Nauss
H. coahuilaensis Conkin and Conkin
H. aff. *H. barreimicus* Myatliuk
? *Haplophragmoides* n. sp.
age: middle Albian.

environment: the variety and abundance of Foraminifera indicate that this deposit was formed under marine conditions, in close proximity to a land mass (wood fragments). The pyritization of some Foraminifera may indicate high toxicity in the bottom waters.

Depth 2,520 ft., cuttings,
GSC loc. C-12200

wood fragments
megaspores
pyritized organic fragments
pyritized and siliceous spheres
radiolaria(?)
Ammobaculites n. sp.
A. fragmentarius Cushman
Gaudryina cf. *G. tailleuri* Tappan
Bathysiphon vitta Nauss
Ammobaculites fragmentarius Cushman (stubby form)
Lagenammina sp.
? *Lagenammina* n. sp.
? *Proteonina* sp.
Saccammina lathrami Tappan
? *Trochammina* sp.
Haplophragmoides sp.
H. ex gr. *H. spissus* Stelck and Wall
H. ex gr. *H. collyra* Nauss
H. ex gr. *H. gigas minor* Nauss
H. aff. *H. platus* Loeblich
H. cf. *H. globosa* Lozo
age: definite middle or late Albian,
probably middle Albian.

environment: the rich, varied agglutinated foraminiferal assemblage is indicative of marine conditions, probably close to a land mass which provided the microflora. The bottom waters may have been more restricted, resulting in the pyritization of some organic material.

Depth 2,720 ft., cuttings,
GSC loc. C-12201

radiolaria
pyritized worm burrows
Dictyometra sp. 9 of Chamney, 1971
Ammobaculites fragmentarius Cushman (stubby form)
Lagenammina sp.
Gaudryina tailleuri Tappan
Glomospirella sp.
Ammodiscus mangusi Tappan
Trochamminoides sp.
? *Trochamminoides* undescribed sp.
Bathysiphon vitta Nauss
B. brosegi Tappan
Reophax cf. *R. troyeri* Tappan
? *Trochammina* sp.
? *Neccammina* undescribed sp.
Haplophragmoides sp.
H. gigas minor Nauss
H. aff. H. eggeri Cushman
H. aff. H. formosum Bolin
age: early to middle Albian.
environment: marine, undifferentiated.

Depth 2,760 ft., cuttings,
GSC loc. C-12202

vertebrate fragments (?teeth)
wood fragments
pyritized spheres
?radiolaria
Bathysiphon brosegi Tappan
Reophax sp.
R. cf. R. minuta Tappan
R. cf. R. troyeri Tappan
Gaudryina, 2 spp. (one is a stubby form)
G. aff. G. barrowensis Tappan
? *Glomospirella gaultina* Berthelin
? *G.* undescribed sp.
? *Saccammina* sp.
Lagenammina sp.
Ammobaculites fragmentarius Cushman (stubby form)
Hyperammina sp.
Haplophragmoides 2 spp.
H. gigas minor Nauss
H. aff. H. formosum Bolin
H. coahuilaensis Conkin and Conkin
? *Haplophragmoides* undescribed sp.
age: early Albian, or less likely, latest
Neocomian.
environment: the rich, varied agglutinated
Foraminifera and the vertebrate frag-
ments suggest that this sample formed
under marine conditions. The pyritized
material and the fact that preservation
is not as good as in samples from
higher levels indicate there may have
been adverse bottom conditions.

Depth 2,830 ft., cuttings,
Bear Rock Formation,
GSC loc. C-12203

pyritized wood fragments
megaspores
Haplophragmoides sp.
H. gigas minor Nauss
minerals: pyrite and glauconite.

age: middle Albian based on the few agglutinated Foraminifera, but this level has been correlated as Devonian on lithological and geophysical data.
environment: brackish or very restricted marine conditions close to a land mass.

Cretaceous Assemblages (Foraminifera and associated microfaunas)
by T.P. Chamney

B.A. Shell I.O.E. Reindeer D-27

69°06'05"N., 134°36'54"W., figure 1a, loc. 3 (note microfossils identified by Chamney, 1971)

Depth 9,579 feet, core,
GSC loc. C-10113

Trochamminoides sp. 9 of Chamney, 1971, abundant
"*Cyclammina*" sp. 1A of Chamney, 1971 (small form)
Gavelinella cf. *G. tumida* Brotzen
Eponides sp.
Praebulimina cf. *P. carseyae* (Plummer)
?*Globorotalia* sp.
Quadrимorphina ex gr. *Q. ruckeri* Tappan, common
?*Globorotalites* ex gr. *G. alaskensis* Tappan
Quadrимorphina sp.

age: *Q. ruckeri* is common in both the Kanguk Formation of early Late Cretaceous age in the Arctic Islands and in the Grandstand Formation of latest Early Cretaceous age in Alaska. Other elements in the assemblage indicate the predominantly Upper Cretaceous equivalents of the unnamed shales below the massive sandstones of the Moose Channel Formation.

environment: the calcareous foraminifers indicate a shallow environment, but with easy access to open marine.

Socony Mobil W.M. Birch YT B-34

66°03'03"N., 136°51'17"W., figure 1a, loc. 11 (note spores identified by Barss in Norford et al., 1972)

Depth 500-600 ft., cuttings,
GSC locs. C-12969 to C-12973

Haplophragmoides spp., common to abundant
Bathysiphon sp., few
Trochammina sp., rare
Ammobaculites sp., common
?*Textularia* sp., rare
?*Plectina* sp., rare
Verneuilinoidea sp., common
Gaudryina spp., common
radiolaria: spherical form, few

Depth 600-620 ft., cuttings,
GSC loc. C-12974

Haplophragmoides sp., few
Ammobaculites sp., few
Bathysiphon sp.
serial agglutinated forms, common

- Depth 620-640 ft., cuttings, radiolaria, common (red colour)
GSC loc. C-12975
Dictyometra sp.
Spumellaria sp.
discoid forms
?Miliammina sp.
Haplophragmoides spp.
age (500-640 ft.): the radiolarian assemblage
is similar to the bituminous shale zone
of the early Late Cretaceous (?Coniacian).
- Depth 640-680 ft., cuttings, *Haplophragmoides* sp., few
GSC locs. C-12976 and C-12977
Gaudryina sp., few
Bathysiphon sp., rare
age: the species of *Gaudryina* is commonly
found in the Cenomanian.
- Depth 680-700 ft., cuttings, *?Spiroplectinata* sp.
GSC locs. C-12978 and C-12979
?Hippocrepina sp.
Reophax spp.
megaspores, common
"*Sporitoides*" spp.
age: the acme of development for the
"*Sporitoides*" group is in the
Cenomanian Stage or in the top of
the late Albian.
- Depth 700-820 ft., cuttings, *Inoceramus* prisms, common
GSC locs. C-12980 to C-12985
Hyperammina sp., common
Ammobaculites ex gr. *A. fragmentarius*
Cushman, few
Haplophragmoides ex gr. *H. gigas minor*
Nauss, common
Reophax spp., few
Trochammina ex gr. *T. uniatensis* Tappan
age: middle to late Albian.
- Depth 820-900 ft., cuttings, *Dictyometra* sp. (pyritized), common
GSC locs. C-12986 to C-12989
Trochammina ex gr. *T. rainwateri*
Cushman and Aplin, few
iron replacement, rods, etc, as a "rusty
zone"
age: Albian, ?middle.
- Depth 900-990 ft., cuttings
and cores, GSC locs. C-12990
to C-12998
?Glomospirella sp., rare
Ammodiscus ex gr. *A. mangusi* (Tappan), rare
Haplophragmoides ex gr. *H. neocomianus*
Chapman, common
pyritized radiolaria, common
age: Albian, ?middle/early boundary
- Chevron Hornell Lake G-24
62°23'21"N., 119°34'40"W., figure 1a, loc. 16
- Depth 810-820 ft., cuttings, fish scales (cycloid), few
GSC loc. C-11812
age: Cretaceous undifferentiated.

Depth 930-940 ft., cuttings, vertebrate (?fish) bone, abundant
GSC loc. C-11813 radiolaria, common
white speckled shale, abundant
pyrite, abundant
age: Late Cretaceous.
biostratigraphic equivalent: Bituminous
Shale Zone.

Depth 1,070-1,180 ft., vertebrate: bone, abundant
cuttings, GSC locs. teeth, few
C-11814 to C-11816 scales, few
vertebrae, few
?pyritized Foraminifera, few
?pyritized radiolaria, common
pyrite (replacement), abundant
age: Late Cretaceous.
biostratigraphic equivalent: Bituminous
Shale Zone.

Depth 1,180-1,190 ft., *Lenticulina* ex gr. *L. teshionensis* Asano, rare
cuttings, GSC loc. C-11817 age: Cretaceous undifferentiated.

Comments: The interval of abundant vertebrate bones (?fish) associated with fish scales and teeth and the orbicular and discoid radiolaria is similar to an occurrence of bone and radiolaria reported from the Arctic Coastal Plain (Chamney, 1972) known from the Bituminous Shale Zone (see footnote, Balkwill and Yorath, 1970, p. 1) near Great Bear Lake (Chamney in Cook and Aitken, 1971, pp. 34-38).

Jurassic Assemblages (macrofossils) by Hans Frebold and J.A. Jeletzky

Panarctic Hoodoo Dome H-37

78°06'27.13"N., 99°45'37.9"W., figure 1b, loc. 21

Depth 7,308-7,328 ft., core, *Acrocoelites* sp. indet.
GSC loc. C-5485 *Posidonia*-like pelecypods
Dactyloceras spp. [including forms related to
D. directum (Buckman), *D. semicelatum*
(Simpson), *D. tenuicostatum* (Young and
Bird) and the group of *D. commune*
(J. Sowerby)]
age: Toarcian, early and possibly earliest
middle.

Triassic Assemblages (macrofossils) by E.T. Tozer

Elf Cape Norem A-80

77°29'13"N., 110°27'05"W., figure 1b, loc. 22

Depth 5,530 ft., core, *Monotis scutiformis typica* Kiparisova
GSC loc. C-5551 age: middle Norian, Columbianus Zone.

Panarctic Sandy Point L-46

76°25'38.40"N., 115°18'14.24"W., figure 1b, loc. 23

Depth 2,527 ft., core, *Monotis daonelliformis* Kiparisova
GSC loc. C-17979 age: middle Norian, Columbianus Zone.

Depth 2,529 ft., core, *Monotis scutiformis* (Teller) sensu lato
GSC loc. C-17980 age: middle Norian, Columbianus Zone.

Depth 2,537-2,550 ft., core, *Gryphaea* sp.
GSC locs. C-17981 to C-17983 age: Late Triassic

Comments: Recent field work in British Columbia by Tozer indicates that the *M. scutiformis* species group is restricted to the Columbianus Zone (middle Norian). *M. scutiformis typica* appears to characterize the middle part of the zone. The material from the Cape Norem core indicates local correlation with the *Monotis* beds of the Heiberg Formation, six miles north of Hare Point, Raanes Peninsula, Ellesmere Island (Tozer, 1961, p. 108) and at least an approximate correlation with the *Monotis* beds of Wolf Fiord, Axel Heiberg Island (Tozer, 1961, p. 108; 1967, p. 44). Specimens from both these localities earlier were tentatively assigned to *M. ochotica* (Keyserling), but are now known to be of the *M. scutiformis* group and probably represent either *M. scutiformis typica* or *M. scutiformis pinensis* Westermann.

Devonian to late Paleozoic Assemblages (Foraminifera and associated microfaunas) by T.P. Chamney

Socony Mobil W.M. Ellen YT C-24

66°38'09"N., 137°50'08"W., figure 1a, loc. 10

Depth 4,861-4,885 ft., core, conodont fragments, few
Hart River Formation, pyrite balls, very abundant
GSC loc. C-13017 age: late Paleozoic.

Depth 5,225-5,229 ft., core, late Paleozoic megaspores, common
Hart River Formation, pyrite balls, common
GSC loc. C-13018

Depth 5,451-5,456 ft., core, late Paleozoic megaspores, few
Hart River Formation, pyrite balls, very abundant
GSC loc. C-13019

Depth 5,600-5,640 ft., recycled microfossils from uphole Cretaceous
cuttings, Hart River strata:
Formation, GSC locs. C-13020
to C-13022 *Dictyometra* sp., few
Haplophragmoides sp., few
Bathysiphon sp., few
possibly *in situ*:
Ammodiscus ex gr. *A. bradynus*
(Spandel), few
Hyperammina ex gr. *H. clavacoidea*
Scherp, few
age: late Paleozoic.

Depth 5,660-5,860 ft., *Ammodiscus* ex gr. *A. bradynus* (Spandel), common
cuttings, Hart River *Hyperammina* ex gr. *H. elegantissima* Plummer,
Formation, GSC locs. C-13023 fide Crespin, common to very abundant
to C-13033 recycled Cretaceous microfossils
age: late Paleozoic.

- Depth 5,880-5,900 ft.,
cuttings, Hart River
Formation, GSC locs. C-13034
and C-13035
- Depth 5,920-5,960 ft.,
cuttings, Hart River
Formation, GSC locs. C-13036
to C-13038
- Depth 5,980-6,200 ft.,
cuttings and core, Hart
River Formation, GSC locs.
C-13039 to C-13051
- Depth 6,220-6,470 ft.,
cuttings and core, Hart
River Formation, GSC locs.
C-13052 to C-13067
- Depth 6,646-6,651 ft.,
cuttings and core, Hart
River Formation, GSC locs.
C-13086 and C-13069
- Depth 6,900-6,940 ft.,
cuttings, Hart River
Formation, GSC locs. C-13070
to C-13072
- Depth 7,125 ft., core,
Hart River Formation,
GSC loc. C-13073
- N.W.T. Deep Bay No. 2
61°18'00"N., 116°48'00"W., figure 1a, loc. 18 (note corals identified by
Pedder in Norford et al., 1972, p. 21)
- Depth 398 ft., core,
Slave Point Formation,
GSC locs. C-10116 and C-10017
- Depth 588 ft., core
Slave Point Formation,
GSC loc. C-10118
- Ammodiscus* sp.
Hyperammina sp.
recycled Cretaceous microfossils
- diastem indicated by abundant pyrite balls,
coproliths, some plant remains and common iron
staining
- conodont fragments, common to abundant
echinoid spines, few
sponge triaxons, few
Hyperammina sp., few
- conodont fragments, common
productid spines, few
sponge axons, few
echinoid spines, common
Hyperammina sp., few
megaspores, late Paleozoic
- ?siliceous Foraminifera: ?*Brunsia* sp., few
pyritized wood, common
pyrite balls, very abundant
pyrite discs, abundant
megaspores, late Paleozoic
age: late Paleozoic, ?Carboniferous
undifferentiated.
- Sacculinella* ex gr. *S. australae* Crespin, few
? *Endothyranella* sp., rare
echinoid spines, few
conodont fragments, few
age: late Paleozoic, ?Carboniferous
- pyritized wood, common
?siliceous Foraminifera (*Glomospirella* sp.), few
megaspores: "*Triletes*" spp., few
age: Paleozoic, undifferentiated
- Hyperammina* sp.
? *Bisphaera* sp.
? *Proteonina* sp.
? *Umbella* sp.
calcispheres
brachiopod fragments
stromatoporoid fragments
- Bisphaera* sp. few
?cricoconarid fragments, few
?ostracods, few
?gastropod fragments, few

Depth 646 ft., core, *Bisphaera* sp., few
Slave Point Formation, *Parathurammina* sp., common
GSC loc. C-10119 calcispheres - *Trochiliscus* sp., abundant
age of four faunules: late Givetian.

Devonian Assemblages (Conodonts) by T.T. Uyeno

Imperial Cartridge F-72

63°11'19"N., 120°29'04"W., figure 1a, loc. 14 (note ostracods identified by Braun *in* Norford *et al.*, 1970, pp. 13-15)

Depth 756-779 ft., core, *Polygnathus linguiformis* Hinde
Lonely Bay Formation, ?*Ozarkodina* sp. (fragmentary)
GSC loc. C-9017 age: Middle Devonian or possibly Late
Devonian.

Depth 804-822 ft., core, *Polygnathus* undescribed sp.
Lonely Bay Formation, *P. angusticostatus* Wittekindt
GSC loc. C-9025 *P. linguiformis* Hinde undescribed subsp.
P. costatus Klapper cf. *P. costatus costatus*
Klapper
Panderodus spp.
Synprioniodina sp.
? *Neopanderodus* sp.
age: Eifelian (about middle to late);
Spathognathodus bidentatus Zone to
Polygnathus kockelianus Zone.

Comments: GSC loc. C-9017: Insofar as is known, *P. linguiformis* Hinde *sensu stricto* is restricted to Middle Devonian, with possible extension into Upper Devonian. Four subspecies are known, but the single specimen present is too fragmentary to allow further identification.

GSC loc. C-9025: The undescribed species of *Polygnathus* has been found to be closely associated with *P. angusticostatus* in southwestern Manitoba and in western District of Mackenzie.

Devonian Assemblages (Corals and Brachiopods) by A.E.H. Pedder

C.P.O.G. Crossley Lake S. K-60

68°29'39"N., 129°29'14"W., figure 1a, loc. 6

Depth 1,385-1,388 ft., core, *Radiastraea* undescribed sp.
Hume Formation, 70 to 73 ft. age: Middle Devonian, Eifelian,
above base, 82 to 85 ft. below *dysmorphostrota* Zone.
top; GSC locs. C-12695 and
C-12696

Comments: Although this species of *Radiastraea* has not yet been described, it is nevertheless a common species. The stage of evolution attained by the specimens strongly suggests that they are from the lower part of the *dysmorphostrota* Zone.

I.N.C. Attoe Lake I-06

67°25'30"N., 133°15'10"W., figure 1a, loc. 8

Depth 3,836-3,837 ft., core, *Syringopora* sp. indet.
Hume Formation, 189 to 190 ft. *Sociophyllum glomerulatum* (Crickmay)
above base, 81 to 82 ft. below age: Middle Devonian, Eifelian,
top; GSC locs. C-12642 and *dysmorphostrota* Zone.
C-12643

Depth 3,902 ft., core, Hume *Pachyfavosites* sp. indet.
Formation, 124 ft. above age: Late Silurian (Ludlovian) to Middle
base, 147 ft. below top; Devonian.
GSC loc. C-12644

Depth 5,270 ft., core, Bear *?Squameofavosites* sp.
Rock Formation, 426 ft. age: probably Early Devonian.
above base, 1,244 ft. below
top; GSC loc. C-12645

Comments: The coral tentatively identified with *Squameofavosites* is crushed.
No detailed work has been done on forms such as these from western Canada.
However, similar and possibly conspecific forms are common in the Lower
Devonian of the Yukon.

Husky et al. Sibbeston G-69

61°58'28"N., 122°41'45"W., figure 1a, loc. 17

Depth 1,943 1/2 ft., core, *Dendrostella trigemme* (Quenstedt)
Nahanni Formation, *Exilifrons* undescribed sp.
GSC loc. C-4376 *Utaratuia* cf. *U. laevigata* Crickmay

Depth 1,950 ft., core, *Alveolites* undescribed sp. (as in C-4381)
Nahanni Formation,
GSC loc. C-4377

Depth 1,959-1,960 ft., core, *Thamnopora* sp. indet.
Nahanni Formation, *Dendrostella trigemme* (Quenstedt)
GSC locs. C-4378 and C-4379 "*Plasmophyllum*" sp. undet.

Depth 1,965 ft., core, *Utaratuia praeclara* (Crickmay)
Nahanni Formation,
GSC loc. C-4380

Depth 1,969 ft., core, *Alveolites* undescribed sp. (as in C-4377)
Nahanni Formation,
GSC loc. C-4381

Depth 1,970 ft., core, *Redstonea sperabile* (Crickmay)
Nahanni Formation,
GSC loc. C-4382

Depth 1,981 ft., core, *Utaratuia* cf. *U. laevigata* Crickmay
Nahanni Formation,
GSC loc. C-4383

Depth 1,985 ft., core, *Sociophyllum glomerulatum* (Crickmay), form with
Nahanni Formation, almost totally suppressed septa
GSC loc. C-4384 age for all eight faunules: Middle Devonian,
late Eifelian, *dysmorphostrota* Zone.

Comments: The fauna in this well is absolutely diagnostic of the Nahanni Formation of the southwest region of the District of Mackenzie. The new species are new only in the sense that they have not been named; both are familiar Hume and Nahanni forms.

Gulf et al. Redknife H-28

61°27'15.67"N., 119°33'51"W., figure 1a, loc. 19

Depth 1,418 ft., core,
Horn Plateau Formation, 31
ft. below top, 396 ft. above
base, GSC loc. C-7141

Cyclochaetetes cf. *C. inflatus* (Lecompte)
Grypophyllum sp. undet.

Depth 1,431 ft., core,
Horn Plateau Formation, 44
ft. below top, 383 ft. above
base, GSC loc. C-7142

Sociophyllum glomerulatum (Crickmay) small var.

Depth 1,432-1,442 ft., core,
Horn Plateau Formation, 45-
55 ft. below top, 382-362 ft.
above base, GSC locs. C-7143
to C-7145

Exilifrons undescribed sp.
trilobite pygidium
age for all three faunules: Middle Devonian,
late Eifelian, typical and diagnostic
of the Nahanni and upper Headless
Formations of the mountain ranges in
the vicinity and north of South
Nahanni River, and of the subsurface
Nahanni Formation.

Gulf et al. Trout River D-14

61°33'10"N., 120°03'40"W., figure 1a, loc. 20

Depth 1,550-1,593 ft., core,
Horn Plateau Formation, 25-
68 ft. below top, 143-100 ft.
above base, GSC locs. C-7147
to C-7152, C-7148A

Sociophyllum glomerulatum (Crickmay) small var.
age: Middle Devonian, late Eifelian.

Depth 1,597-1,599 1/2 ft.,
core, Horn Plateau Formation,
72-74 1/2 ft. below top, 96-
93 ft. above base, GSC locs.
C-7153 and C-7154

Psydracophyllum lonsdaleiaforme Pedder
age: Middle Devonian, late Eifelian.

Depth 1,607 ft., core,
Horn Plateau Formation, 82
ft. below top, 86 ft. above
base, GSC loc. C-7155

Sociophyllum glomerulatum (Crickmay) small var.
age: Middle Devonian, late Eifelian.

Depth 1,610 1/2 ft., core,
Horn Plateau Formation,
85 1/2 ft. below top, 82 1/2
ft. above base, GSC loc.
C-7156

Pachyfavosites sp. undet.
age: Middle Devonian.

Depth 1,624 ft., core, Horn
Plateau Formation, 99 ft.
below top, 69 ft. above base,
GSC loc. C-7157

?*Utaratuia* undescribed sp.
age: Middle Devonian, this species should
not be significantly older than the
overlying faunas.

Depth 1,628 1/2 ft., core, *Thamnopora* sp. undet.
Horn Plateau Formation, new tetracoral of uncertain affinities
103 1/2 ft. below top, age: Middle Devonian.
64 1/2 ft. above base, GSC
loc. C-7158

Devonian Assemblages by M.J. Copeland (Ostracodes),
B.S. Norford (Plants) and A.W. Norris (Brachiopods)

Panarctic Towson Point F-63

75°52'17.18"N., 106°24'37.09"W., figure 1b, loc. 24

Depth 3,260 ft., cuttings, *Eochara* sp.
GSC loc. C-17984 age: Middle Devonian.

Depth 3,690-3,700 ft., *Howellella* sp.
cuttings, GSC loc. C-17985 undetermined brachiopod fragments
age: Early Silurian to early/Middle Devonian,
probably Gedinnian.

Depth 3,750 ft., cuttings, primitiopsid? ostracode indet.
GSC loc. C-17986 *Bairdiocypris?* sp.
age: Middle Ordovician to Middle Devonian.

Comments: Charophytes have been described from Lower Devonian rocks in Europe, but in North America are known only from Middle Devonian and younger rocks (see Belyea and Norford, 1967, p. 38). *Eochara wickendeni* Choquette is known from the Cedared, Pine Point, Watt Mountain and Slave Point Formations of Western Canada and the *Eochara* sp. of GSC loc. C-17984 has similar dimensions to those of *E. wickendeni* (Rice, 1970; Eyer, 1971).

Howellella sp., present in sample from GSC loc. C-17985, is represented by the pedicle valve of a very tiny, strongly costate juvenile form. The strong costation suggests that it is a Devonian rather than a Silurian form. Representatives of the genus have been recorded previously from rocks of Early Devonian age at several localities in the Queen Elizabeth Islands. In Nevada, species of the genus are known in rocks as late as Emsian (late Early Devonian) and Eifelian (early Middle Devonian) in age.

Devonian and Silurian Assemblages by D.C. McGregor (Spores)
A.E.H. Pedder (Corals) and T.T. Uyeno (Conodonts)

Aquitaine Hudson Walrus A-71

58°30'0.29"N., 87°10'48.75"W., figure 1b, loc. 26

Depth 2,000-2,002 ft., core, *Ancyrospora* cf. *A. simplex* Guenel
Williams Island Formation, *Camarozonotriletes*, 2 spp.
GSC locs. C-7428 and C-7429 *Emphanisporites neglectus* Vigran
Geminospora, 4 spp.
Grandispora sp.
Lophozonotriletes, 2 spp.
form related to *Rhabdosporites? vermiculatus*
Sanders
Spinozonotriletes cf. *S. naumovii* (Kedo)
Richardson
indeterminate gastropods (pyritized)
fish fragments
scolecodonts (some pyritized)
Icriodus cf. *I. nodosus* (Huddle) sensu lato
age: late Givetian or early Frasnian,
probably late Givetian.

Depth 3,917-3,922 ft., core, *Rhegmaphyllum* sp.
GSC locs. C-4310 to C-4312, *Mesofavosites* sp.
C-4319 *Ozarkodina* aff. *O. adiutricis* Walliser
Panderodus sp.
Trichonodella sp.
age: late Llandovery or Wenlock, probably
late Llandovery.

Ordovician and Silurian Assemblages (Corals and Trilobites)
by B.S. Norford

C.P.O.G. Kugaluk N-02
68°31'55"N., 131°31'19"W., figure 1a, loc. 5

Depth 5,590-5,614 ft., core, *Cystihalysites* sp.
Mount Kindle Formation, *Favosites* sp.
GSC locs. C-18011 and C-18012 age: Silurian.

Depth 5,819 1/2 ft., core, ?*Cystihalysites* sp.
Mount Kindle Formation, ?*Favosites* sp.
GSC loc. C-18016 age: Silurian.

Depth 6,111-6,126 ft., core, ?*Catenipora* sp.
Mount Kindle Formation, age: late Middle Ordovician to Late Silurian.
GSC locs. C-18019 and C-18020

Depth 6,491 ft., core, favositid coral(?)
Mount Kindle Formation, age: probably Late Ordovician or Silurian.
GSC loc. C-18025

Richfield et al. Pt. Separation No. 1
67°34'06"N., 134°00'10"W., figure 1a, loc. 7

Depth 7,984 1/2-7,993 ft., undetermined stromatoporoids
core, Ronning Group, *Cystiphyllum* sp.
GSC locs. C-18061 to C-18063 *Favosites* 2 spp.
Multisolenia tortuosa Fritz
heliolitid(?) coral
age: Silurian, probably late Llandovery.

Depth 8,007 ft., core, halysitid coral
Ronning Group, *Favosites* sp.
GSC loc. 44818 age: Silurian

Depth 8,017-8,019 ft., core, undetermined stromatoporoid
Ronning Group, *Cystiphyllum* sp.
GSC locs. C-18066 and 44820 *Favosites* sp.
age: Silurian.

Peel Plateau Eagle Plain YT No. 1
66°48'54"N., 138°08'30"W., figure 1a, loc. 9

Depth 7,061 ft., core, ?*Favosites* sp.
Road River Formation, *Syringopora* sp.
GSC loc. C-18050 age: Silurian to Devonian

- Depth 7,337-7,377 ft., core, undetermined brachiopods
GSC locs. C-18051 and 69291 *Favosites* sp.
Aulacopleura sp.
age: probably Late Llandovery.
- Depth 7,891-7,898 ft., core, stromatoporoid(?)
GSC locs. C-18056 to C-18059 *Bighornia* sp.
?Lobocorallium sp.
Palaeophyllum sp.
Catenipora 2 spp.
Palaeofavosites sp.
?Palaeofavosites sp.
age: Late Ordovician.
- F.P.C. Tenneco Root River I-60
62°39'32.21"N., 123°24'28.96"W., figure 1a, loc. 15 (amplification of material
by Norford *in* Norford et al., 1970).
- Depth 6,624-6,631 ft., core, *Bighornia* sp.
Mount Kindle Formation, *Lobocorallium* sp.
GSC locs. C-18037 and C-2520 *Palaeophyllum* sp.
age: Late Ordovician.
- Aquitaine et al. Rowley M-04
69°03'58.48"N., 79°03'48.32"W., figure 1b, loc. 25
- Depth 578 1/2 ft., core, *Catenipora* sp.
Baillarge Formation, age: probably Late Ordovician.
GSC loc. C-17328
- Depth 600-611 ft., core, *Bighornia parva* Duncan
Baillarge Formation, *?Deiracorallium* sp.
GSC locs. C-17330 to C-17333 *Catenipora* aff. *C. rubra* Sinclair and Bolton
- Depth 613-622 ft., core, indeterminate streptelasmid coral
Baillarge Formation, *Palaeophyllum* sp.
GSC locs. C-17334 to C-17338 *Catenipora* sp.
- Depth 626 1/2-644 1/2 ft., dendroid graptolite(?)
core, Baillarge Formation, *Bighornia* sp.
GSC locs. C-17339 to C-17343 *Deiracorallium* sp.
Catenipora sp.
- Depth 645 1/2 ft., core, *Bighornia parva* Duncan
Baillarge Formation,
GSC loc. C-17344
- Depth 665 ft., core, *Bumastoides* sp.
Baillarge Formation,
GSC loc. C-17347
- Depth 693 1/2-701 ft., core, *Deiracorallium manitobense* Nelson
Baillarge Formation, GSC *?Lobocorallium* sp.
locs. C-17352 to C-17355 *Catenipora* sp.
bryozoans
age: 600-701 ft., Late Ordovician, Division
B of Norford, 1970.

- Depth 772 1/2 ft., core, *Catenipora* cf. *C. stearni* Nelson
Baillarge Formation, age: late Middle Ordovician.
GSC loc. C-17357
- Depth 788 1/2 ft., core, *Grewingkia robusta* (Whiteaves)
Baillarge Formation,
GSC loc. C-17361
- Depth 795-813 1/2 ft., core, *Grewingkia* sp.
Baillarge Formation, *Catenipora*, 2 spp.
GSC locs. C-17362 to C-17366 undetermined tabulate coral
- Depth 814-816 ft., core, *Grewingkia* sp.
Baillarge Formation, *Catenipora* cf. *C. stearni* Nelson
GSC locs. C-17367 to C-17368
- Depth 913-924 ft., core, *Maclurites* sp.
Baillarge Formation, *Catenipora* sp.
GSC locs. C-17372 to C-17373
- Depth 969-974 ft., core, indeterminate streptelasmid coral
Baillarge Formation, ? *Maclurites* sp.
GSC locs. C-17375 to C-17377 *Catenipora* sp.
- Depth 1,031 1/2-1,066 ft., indeterminate streptelasmid and tabulate corals
core, Baillarge Formation, ? *Maclurites* sp.
GSC locs. C-17379 to C-17383 ? *Grewingkia* sp.
 age: 772 1/2-1,066 ft., late Middle Ordovician,
 Division A of Norford, 1970.
- Depth 1,124 1/2 ft., core, ? *Chaetetipora* sp.
Baillarge Formation, age: late Middle Ordovician.
GSC loc. C-17384

Comments: Two assemblage zones can be discriminated in the Baillarge Formation penetrated by the well. The upper zone extends at least from 600 to 701 feet, is about Ashgillian in age and corresponds to Division B in the Kaskattama Province No. 1 well of northern Manitoba (Norford, 1970). The Churchill River Group of the surface rocks of northern Manitoba contains faunules (Nelson, 1963) representing Division B. The assemblage from 600 to 701 feet is more similar to the faunules from the lower part of the Churchill River Group (Caution Creek Formation and basal Chasm Creek Formation) than to those from the upper part. Division B is about 290 feet thick in the Kaskattama well and the interval in the Rowley M-04 well probably represents approximately the lower half of the biostratigraphic division.

The lower zone extends from at least 772 1/2 to 1,066 feet and perhaps to beyond 1,124 1/2 feet. It is about late Caradoc in age and corresponds to Division A in the Kaskattama Province No. 1 well and to the Bad Cache Rapids Group of the northern Manitoba outcrops. Division A is about 325 feet thick in the Kaskattama well.

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