



GEOLOGICAL
SURVEY
OF
CANADA

DEPARTMENT OF ENERGY,
MINES AND RESOURCES

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PAPER 70-15

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

(Report and 1 figure)

B. S. Norford, W. K. Braun, T. P. Chamney, W. H. Fritz,
D. C. McGregor, A. W. Norris, A. E. H. Pedder and T. T. Uyeno



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ABSTRACT

Identifications and age determinations are presented for fossils from twenty wells in the Districts of Mackenzie and Franklin and the Yukon Territory. Ages range from Middle Cambrian to Late Cretaceous and are based on identifications of spores, pollen, conodonts, ostracods, foraminifers, corals, brachiopods and trilobites.



Figure 1. Map showing location of wells discussed in text

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INTRODUCTION

The assimilation of information resulting 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. The geologists responsible for these assignments are:

H. R. Belyea	Arrowhead I-46, Cartridge F-72, Davidson Creek P-2, Netla M-31, Redknife N-6 and Willow Lake B-28 wells.
J. W. Kerr	Bathurst Caledonian River J-34 and Winter Harbour No. 1 wells.
W. S. MacKenzie	Camsell A-37, Ebbutt D-50 and Ebbutt J-70 wells.

The stratigraphic frameworks have not yet been established for the intervals reported in the remaining wells and formational assignments are not possible. Most of the fossils are stored in the collections of the Geological Survey of Canada in Calgary; the remainder are stored in Ottawa.

Much of the information in this paper has been used by geologists 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. Banff Oil Limited kindly permitted studies conducted for the company by W. K. Braun (University of Saskatchewan) to be included in this publication.

The paper was compiled by B. S. Norford.

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WELLS STUDIED AND SHOWN ON FIGURE 1

<u>Locality</u>	<u>Well Name</u>	<u>Year Completed</u>	<u>Ages Reported</u>	<u>Author</u>
1	I. O. E. Stoney Core Hole F-42	1967	Cretaceous	Chamney
1	I. O. E. Stoney Core Hole F-52A	1967	Cretaceous	Chamney
2	Shell Peel River YT L-19	1966	Devonian	McGregor
3	Shell Peel River YT K-76	1965	Cretaceous	McGregor
4	Shell Peel River YT I-21	1966	Devonian- Carboniferous	McGregor
5	Western Minerals Chance YT No. 1	1960	Cretaceous	Chamney
6	Shell Keele River L-4	1965	Cambrian	Fritz
7	Imperial Cartridge F-72	1960	Devonian	Braun
8	F. P. C. Tenneco Root River I-60	1963	Ordovician	Norford
9	I. O. E. Triad Ebbutt D-50	1964	Devonian	Braun
10	I. O. E. - Triad Ebbutt J-70	1964	Devonian	Uyeno-Braun
11	Imperial Triad Willow Lake B-28	1960	Devonian	Braun
12	Imperial Triad Davidson Creek P-2	1960	Devonian	Uyeno
13	H. B. Amerada Camsell A-37	1966	Devonian	Pedder
14	Imperial Redknife N-6	1962	Devonian	Pedder-Norris
15	Murphy et al. Netla M-31	1967	Devonian	Pedder
16	Imperial Sun Arrowhead I-46	1961	Devonian	Braun
17	Union Pan Am Trainor L-59	1966	Devonian	Pedder

Arctic Islands wells not shown by map

Dome et al. Winter Harbour No. 1	1962	Silurian	Norford
Dominion Explorers-Canso et al. Bathurst Caledonian River J-34	1964	Silurian	Norford

CORRELATIONS AND IDENTIFICATIONS OF FOSSILS

Cretaceous Assemblages by T. P. Chamney

I. O. E. Stoney Core Hole F-42

67° 21' 23" N., 135° 38' 43" W., Figure 1, loc. 1

Depth 725-730 ft., core,
GSC loc. C-4343

Ammobaculites sp. (with Reophax style serial chambers)
Ammodiscus cf. A. mackenziensis Chamney
Gaudryina tappanae Chamney
Haplophragmoides ex gr. H. goodenoughensis Chamney
H. duoflatis Chamney
Lenticulina sp.
? Psamminopelta sp.
Saccamina ex gr. S. lathrami Tappan
Saracenaria sp.
age: Early Cretaceous, Neocomian, Barremian

- Depth 900-910 ft. , core,
GSC loc. C-4344
- megaspores
Ammobaculites ex gr. A. reophacoides Bartenstein
Bathysiphon scintillata Chamney
Haplophragmoides ex gr. H. neocomiana Chamney
? Thuramminoides cf. T. septagonalis Chamney
? Triplasia sp.
Trochammina n. sp.
age: Early Cretaceous, Neocomian, Barremian-Hauterivian
- Depth 1,010-1,020 ft. , core,
GSC loc. C-4345
- Ammodiscus mackenziensis Chamney
Haplophragmoides ex gr. H. duoflatis Chamney
? Glomospirella sp.
Reophax (Proteonina) sp.
age: Early Cretaceous, Neocomian, restricted marine microfauna
- I. O. E. Stoney Core Hole F-52A
67° 21' 21" N. , 135° 40' 21" W. , Figure 1, loc. 1
- Depth 55-60 ft. , core,
GSC loc. C-4338
- megaspores
Ammodiscus sp.
Bathysiphon brosgei Tappan
Gaudryina sp.
G. nanushukensis Tappan
Gavelinella spp.
Haplophragmoides sp.
Marginulinopsis sp.
Trochamminoides sp.
Valvulineria ex gr. V. loetterlei Tappan
age: Early Cretaceous, Albian, possibly early Middle Albian
- Depth 270-280 ft. , core,
GSC loc. C-4339
- gastropods
Inoceramus prisms
Ammobaculites ex gr. A. fragmentarius Cushman
Conorbina (Quadriformina) sp.
Haplophragmoides spp.
H. gigas minor Nauss
Lenticulina macrodisca Reuss
Milliammina ex gr. M. mantobensis Wickenden
Saracenaria sp.
Spiroplectammina sp.
Trochamminoides sp.
Verneulinoides ex gr. V. borealis Tappan
age: Early Cretaceous, Albian, late phase of Early to Middle Albian "Clearwater Sea" transgression
- Depth 320-340 ft. , core,
GSC loc. C-4340
- megaspores
echinoderm fragments
Dentalina sp.
Gaudryina sp.

Gavelinella sp.

Haplophragmoides ex gr. H. gigas minor Nauss (dwarf form)

Hyperammia sp.

Saracenaria sp.

age: Early Cretaceous, Early Albian, Saracenaria trollopei Zone (Mountjoy and Chamney, 1969, p. 38-39)

Depth 523 ft. , core,
GSC loc. C-4342

abundant glauconite, some as probable casts of foraminifers
Bathysiphon sp.

Reophax sp.

age: the coarse grained foraminifers are similar to forms from stratigraphically below the Early Albian "Clearwater Sea" assemblage (Mountjoy and Chamney, 1969, p. 35)

Western Minerals Chance YT No. 1

66° 07' 46" N. , 137° 31' 27" W. , Figure 1, loc. 5

Depth ?0-1,510 ft. , cuttings
and core,
GSC locs. C-5129 to
C-5146

protistids

?Cyclammina sp.

Lituotuba sp.

?Millammina cf. M. bisobscura Stelck and Wall

Trochammina sp.

age: Cretaceous, apparently Late Cretaceous but exact stage cannot be interpreted

Depth 1,510-3,000 ft. ,
cuttings and core,
GSC locs. C-5147 to
C-5154

megaspores

?Gaudryina sp.

?Millammina sp.

age: by stratigraphic position this interval is probably Albian

Depth 3,000-4,034 ft. ,
cuttings and core,
GSC locs. C-5155 to
C-5160

Ammodiscus sp. (minute form)

A. cf. A. fragmentarius Cushman

Bathysiphon scintillata Chamney

Gaudryina tappanae Chamney

G. cf. G. subcretacea Cushman

Gavelinella sp.

age: Early Cretaceous, very probably Neocomian

Devonian to Cretaceous Assemblages by D. C. McGregor

Shell Peel River YT L-19

66° 48' 39.30" N. , 135° 18' 23.71" W. , Figure 1, loc. 2

Depth 670 ft. , sidewall
core, GSC Plant loc. 8150

Lophozonotriletes spp.

L. cristifer (Luber) Kedo

Tumulispora variverrucata (Playford) Staplin and Jansonius
various other spores

age: probably Late Devonian ("Strunian", Tn1a, earliest Tournaisian). Spores rare and rather poorly preserved, the taxa cited range from Late Devonian into Early Carboniferous and thus are not useful for refined dating. However, T. variverrucata first appears very high in the Devonian and the overall aspect of the assemblage suggests Late Devonian rather than Carboniferous. Assemblage also contains single specimens similar to Retusotriletes antiquus Naumova and Hymenozonotriletes deliquescens Naumova that probably are re-worked from Givetian or Frasnian sources

Depth 696 ft. , sidewall
core, GSC Plant loc. 8151

Fragments of two types of anchor-spined spores (cf. Ancyrospora, cf. Hystricosporites). Spores with this type of appendage are common in Devonian assemblages but only very rarely have been detected above the Devonian.
age: probably Late Devonian, Late Famennian or "Strunian"

Depth 750 ft. , sidewall
core, GSC Plant loc. 8152

Chelinospora sp.
Deltoidospora sp.
? Hymenozonotriletes denticulatus Naumova
? H. varius Naumova
Hystricosporites porcatus (Winslow) Allen
Lophozonotriletes cristifer (Luber) Kedo
Reticulatisporites sp.
age: Late Devonian, Late Famennian

Depth 860 ft. , sidewall
core, GSC Plant loc. 8154

Archaeozonotriletes famenensis Naumova
Hymenozonotriletes parvimammatus Naumova
? H. submirabilis (Luber) Jushko
? H. varius Naumova
Lophozonotriletes cristifer (Luber) Kedo
Reticulatisporites sp.
Verrucosisporites sp.
fragment cf. Ancyrospora or cf. Hystricosporites
age: Late Devonian, Famennian

Depth 900 ft. , sidewall
core, GSC Plant loc. 8155

spores rare, poorly preserved
age: probably Famennian, possibly Late Famennian

Depth 1,200 ft. , sidewall
core, GSC Plant loc. 8157

Archaeozonotriletes famenensis Naumova
Cornispora varicornata Staplin
? Hymenozonotriletes explanatus (Luber) Kedo
? H. denticulatus Naumova
Hystricosporites sp.
Lophozonotriletes cristifer (Luber) Kedo
(=Torispora? tiara Staplin)
Perotriletes sp.
age: Late Devonian, Famennian

- Depth 1,500 ft. , sidewall
core, GSC Plant loc. 8159
- ?Acanthotriletes famenensis Naumova
Convolutispora sp.
Cymbosporites sp.
Deltoidospora sp.
Hystricosporites porrectus (Balme and Hennelly) Allen
Lophozonotriletes cristifer (Luber) Kedo
?Raistrickia aratra Allen
age: Late Devonian, Famennian
- Depth 1,600 ft. , sidewall
core, GSC Plant loc. 8160
- ?Biharisporites sp. (fragment)
Calamospora atava (Naumova) McGregor
Cristatisporites sp.
Hystricosporites sp.
Lophozonotriletes curvatus Naumova
L. cf. L. torosus Naumova
Perotrilites sp.
Samarisporites sp.
age: Late Devonian, possibly Famennian
- Depth 1,705 ft. , sidewall
core, GSC Plant loc. 8161
- cf. Archaeozonotriletes dedaleus Naumova
Lophozonotriletes cristifer (Luber) Kedo
L. curvatus Naumova
age: Late Devonian
- Depth 1,920 ft. , sidewall
core, GSC Plant loc. 8163
- Ancyrospora sp.
Cornispora varicornata Staplin
Lophozonotriletes cristifer (Luber) Kedo
cf. L. scurrus Naumova
cf. Retusotriletes greggsii McGregor
age: Late Devonian, probably Famennian
- Depth 2,020 ft. , sidewall
core, GSC Plant loc. 8164
- Cornispora varicornata Staplin
Hystricosporites sp.
other spores, some with Frasnian affinities
age: Late Devonian, probably early Famennian
- Depth 2,500 ft. , sidewall
core, GSC Plant loc. 8165
- cf. Hymenozonotriletes denticulatus Naumova
age: Late Devonian, late Frasnian or early Famennian
- Depth 2,878 ft. , sidewall
core, GSC Plant loc. 8166
- ?Archaeoperisaccus sp.
?Cymbosporites cyathus Allen
?Hymenozonotriletes denticulatus Naumova
?H. meonacanthus Naumova
Hystricosporites sp.
Pustulatisporites sp.
age: Late Devonian, tentatively late Frasnian but
spores are few and poorly preserved
- Depth 4,035 ft. , sidewall
core, GSC Plant loc. 8168
- Archaeoperisaccus sp.
A. cf. A. timanicus Pashkevich
?Cymbosporites cyathus Allen
?Samarisporites hesperus Allen
age: Late Devonian, Frasnian

Depth 5,000 ft., sidewall
core, GSC Plant loc. 8170

spores, poorly preserved
age: Late Devonian, late Frasnian or Famennian

Depth 5,500 ft., sidewall
core, GSC Plant loc. 8171

Apiculiretuispora sp.
Dictyotriletes 2 spp.
Dibolisporites sp.
? Grandispora sp.
Hystricosporites sp.
age: Middle Devonian or early Late Devonian

Shell Peel River YT I-21

66° 10' 36.50" N., 134° 18' 52.18" W., Figure 1, loc. 4

Depth 670 ft., sidewall
core, GSC Plant loc. 8173

various spores
age: Early Carboniferous, Tournaisian

Depth 700 ft., sidewall
core, GSC Plant loc. 8174

Densosporites rarispinosus Playford
cf. D. subcrenatus (Waltz) Potonié and Kremp
? Dictyotriletes tschernyschensis Jushko
Hymenozonotriletes? gregarius Staplin and Jansonius
Knoxisporites literatus (Waltz) Playford
K. margarethae Hughes and Playford
? Leiozonotriletes insignitus Hacquebard
Lophozonotriletes cristifer (Luber) Kedo
L. rarituberculatus (Luber) Kedo non Naumova
Tumulispora variverrucata (Playford) Staplin and Jansonius
Velosporites sp.
age: Early Carboniferous, Tournaisian, probably
early or middle Tournaisian

Depth 1,400 ft., sidewall
core, GSC Plant loc. 8175

various spores, poorly preserved
age: Early Carboniferous, Tournaisian

Depth 1,600 ft., sidewall
core, GSC Plant loc. 8176

various spores, poorly preserved
age: Early Carboniferous, Tournaisian

Depth 1,650 ft., sidewall
core, GSC Plant loc. 8177

cf. Reticulatisporites? fimbriatus var. fimbriatus Winslow
cf. Stenozonotriletes inductus Ischenko
various species in common with sample from depth 700 ft.
age: probably early Tournaisian

Depth 1,750 ft., sidewall
core, GSC Plant loc. 8178

various species, essentially similar to above sample
age: probably early Tournaisian

Depth 2,400 ft., sidewall
core, GSC Plant loc. 8179

spores rare and poorly preserved
age: probably Tournaisian

Depth 2,500 ft., sidewall
core, GSC Plant loc. 8180

Hymenozonotriletes lepidophytus Kedo
Hystricosporites sp.
Lophozonotriletes rarituberculatus (Luber) Kedo non Naumova
Reticulatisporites fimbriatus var. fimbriatus Winslow
Tumulispora variverrucata (Playford) Staplin and Jansonius

Vallatisporites sp.

various other species of spores

age: latest Devonian, post-Famennian, early Tournaisian. H. lepidophytus characterizes an interval equivalent to the "Strunian" and very late Famennian in Belgium and Germany and appears to be restricted to the same interval in Canada, U.S.A., England, Australia, Bielorussia and Bashkiria. The extinction of this species corresponds very closely to the Devonian-Carboniferous boundary as defined at the Carboniferous Congress in Heerlen, 1935

Depth 2,600 ft., sidewall core, GSC Plant loc. 8181

various species, similar to above sample

age: latest Devonian, "Strunian"

Depth 2,700 ft., sidewall core, GSC Plant loc. 8182

various species, similar to above two samples

age: latest Devonian, "Strunian"

Depth 3,050 ft., sidewall core, GSC Plant loc. 8186

spores rare and poorly preserved

age: Late Devonian, possibly "Strunian"

Depth 3,100 ft., sidewall core, GSC Plant loc. 8187

?Hymenozonotriletes lepidophytus Kedo

age: Late Devonian, probably "Strunian" or very late Famennian

Depth 3,200 ft., sidewall core, GSC Plant loc. 8188

spores extremely poorly preserved

age: possibly "Strunian"

Depth 4,000 ft., sidewall core, GSC Plant loc. 8190

spores extremely poorly preserved

age: probably Devonian

Shell Peel River YT K-76

66° 25' 35.4" N., 134° 14' 07.9" W., Figure 1, loc. 3

Depth 1,382 ft., sidewall core, GSC Plant loc. 8195

various Early Cretaceous spores

pollen

dinoflagellate cysts

reworked (?) "Strunian" spores

age: Early Cretaceous (unless contaminated)

Depth 1,448 ft., sidewall core, GSC Plant loc. 8196

similar spore assemblage to that at depth 700 ft. in Shell Peel River YT I-21 and is undoubtedly Early Carboniferous, Tournaisian. There is no trace of younger (e.g. Early Cretaceous) palynomorphs but both the immediately higher and lower samples contain Early Cretaceous fossils and thus this assemblage was probably recycled from a Tournaisian source in Early Cretaceous time

- Depth 1,472 ft., sidewall core, GSC Plant loc. 8197 an assemblage of "Strunian", ?Visean and Early Cretaceous palynomorphs (including abundant dinoflagellate cysts). Unless the sidewall core is contaminated, the sample is Early Cretaceous. Note: Cretaceous rocks in the Peel River region commonly do contain reworked Devonian and Early Carboniferous spores.
- Depth 1,517 ft., sidewall core, GSC Plant loc. 8198 Tournaisian spore assemblage but probably reworked
- Depth 1,682 ft., sidewall core, GSC Plant loc. 8199 Tournaisian spore assemblage but probably reworked
- Depth 2,462 1/2 ft., sidewall core, GSC Plant loc. 8201 abundant reworked Tournaisian spores; rare and rather poorly preserved Jurassic or Early Cretaceous palynomorphs
age: Jurassic or Early Cretaceous

Devonian Assemblages (Brachiopods) by A.W. Norris

Imperial Redknife N-6

60° 55' 49" N., 119° 16' 10" W., Figure 1, loc. 14 (note coral identified by Pedder)

- Depth 3,167-3,169 ft., core, lowest beds of Horn River Formation, transitional to lower Keg River Formation, GSC loc. C-3921 Lingula cf. L. minuta Meek
Leiorhynchus cf. L. castanea (Meek)
? L. cf. ? L. awokanak McLaren
age: Middle Devonian, Givetian, typical of upper two-thirds of Pine Point Formation and equivalent beds of the Great Slave Lake outcrop belt
- Depth 3,170-3,172 ft., core, lowest beds of Horn River Formation, transitional to lower Keg River Formation, GSC loc. C-3922 ? Emanuella sp.
leiorhynchid fragments
age: Middle Devonian, Givetian, as for above collection
- Depth 3,179 ft., core, lower Keg River Formation, GSC loc. C-3923 echinoderm ossicle (single axial canal)
atrypid shell fragments
Tentaculites sp.
age: Middle Devonian, Givetian, on stratigraphic position
- Depth 3,180 ft., core, lower Keg River Formation, GSC loc. C-3924 echinoderm ossicles
Desquamatia cf. D. arctica (Warren)
Tentaculites sp.
age: Middle Devonian, early Givetian, roughly equivalent to lower third of Pine Point Formation of Great Slave Lake area

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

Imperial Redknife N-6

60° 55' 49" N., 119° 16' 10" W., Figure 1, loc. 14 (note brachiopods identified by Norris)

Depth 3,056 ft., core, Stringophyllum n. sp.
Sulphur Point Formation, age: Middle Devonian, Givetian
GSC loc. C-4176

Union Pan Am Trainor L-59

60° 28' 33" N., 120° 40' 50" W., Figure 1, loc. 17

Depth 5,846 ft., core, Hermatostroma sp. (identified by N. R. Fischbuch)
Sulphur Point Formation, Grypophyllum cf. G. wedekindi Middleton
GSC loc. C-3984 age: Middle Devonian, Givetian

Depth 5,853 ft., core, Stachyodes sp.
Sulphur Point Formation, Grypophyllum cf. G. wedekindi Middleton
GSC loc. C-3985 age: Middle Devonian, Givetian

Depth 5,917 ft., core, Temnophyllum n. sp.
Pine Point Formation, age: Givetian
GSC loc. C-399

Depth 5,944 ft., core, Thamnopora sp.
Pine Point Formation, Temnophyllum n. sp.
GSC loc. C-403 age: Givetian

H. B. Amerada Camsell A-37

61° 46' 09.15" N., 122° 35' 55.3" W., Figure 1, loc. 13

Depth 1,104 1/2-1,124 ft., Stromatopora sp.
core, Nahanni Formation Cyclochaetetes cf. C. inflatus (Lecompte)
GSC locs. C-1748-51 Favosites sp.
C-2546-57 Thamnopora sp.
aulopodid fragments
Dendrostella trigemme (Quenstedt)
Kozlowiaphyllum cf. Australophyllum (?) cf. A. thomasae
of McLaren
Grypophyllum cf. G. wedekindi Middleton
Sociophyllum glomerulatum (Crickmay)
Mesophyllum sp.
brachiopod indet. (possibly a reticulariid)
age: Middle Devonian, early Givetian, possibly
late Eifelian

Murphy et al. Netla M-31

60° 50' 52" N., 123° 07' 15" W., Figure 1, loc. 15

Depth 4,299 ft., core, Mesophyllum n. sp. ex gr. M. salairicum (Bulvanker)
lower Keg River Formation, age: Middle Devonian, early Givetian, possibly
GSC loc. C-1985 late Eifelian

Devonian Assemblages (Conodonts) by T. T. Uyeno

Imperial Triad Davidson Creek P-2

62° 11' 45" N. , 118° 15' 05" W. , Figure 1, loc. 12

Depth 1,726 ft. , core, lower Belodella sp.
Keg River Formation, ?Hindeodella sp.
(Lonely Bay Formation) Panderodus sp.
GSC loc. 72910 Polygnathus linguiformis linguiformis Hinde
age: probably Middle Devonian

Depth 1,754 ft. , core, lower Panderodus sp.
Keg River Formation, Polygnathus "webbi" Stauffer form transitional to
(Lonely Bay Formation) P. linguiformis linguiformis Hinde
GSC loc. 72915 age: probably Middle Devonian

Depth 1,758 ft. , core, lower Hindeodella sp.
Keg River Formation, Polygnathus linguiformis linguiformis Hinde
(Lonely Bay Formation) age: probably Middle Devonian
GSC loc. 72916

I. O. E. - Triad Ebbutt J-70

62° 19' 31" N. , 121° 57' 03" W. , Figure 1, loc. 10 (note ostracods identified by W. K. Braun)

Depth 1,055 ft. , core, Angulodus walrathi (Hibbard)
Nahanni Formation, GSC Hindeodella sp.
loc. 72901 Panderodus sp.
Polygnathus xylus Stauffer
age: probably Middle Devonian

Depth 1,065 ft. , core, Hindeodella sp.
Nahanni Formation, GSC Icriodus expansus Branson and Mehl
loc. 72903 Polygnathus xylus Stauffer
age: probably Middle Devonian

Depth 1,068 ft. , core, Angulodus sp.
Nahanni Formation, GSC Belodella cf. B. triangularis (Stauffer)
loc. 72902 Hindeodella sp.
Polygnathus xylus Stauffer
age: probably Middle Devonian

Devonian Assemblages (Ostracods and other microfossils) by W. K. Braun

I. O. E. - Triad Ebbutt J-70

62° 19' 31" N., 121° 57' 03" W., Figure 1, loc. 10 (note conodonts identified by T. T. Uyeno)

Depth 1,030-1,040 ft., core, Aparchites spp. Schmidtella? sp.
Nahanni Formation, GSC Coelonella spp. Youngiella sp.
locs. C-5273-5 Microcheilinella sp. Novakia sp.
Orthocypris sp. Styliolina sp.
Phlyctiscapha sp. lingulid brachiopods

Depth 1,040-1,052 ft., core, Aparchites spp. Orthocypris sp.
Nahanni Formation, GSC Phlyctiscapha? sp. Novakia sp.
loc. C-5276-8 age: Middle Devonian, Givetian (?), possibly
c-fauna of upper Hume Formation of Norman
Wells area and upper part of Nahanni Formation
of the southern Mackenzie Mountains

Depth 1,268-1,285 ft., core, bairdiocyprid fragments Tentaculites sp.
Nahanni Formation, GSC age: indeterminate
locs. C-5279-81

I. O. E. - Triad Ebbutt D-50

62° 19' 01" N., 122° 23' 30" W., Figure 1, loc. 9

Depth 1,150-1,165 ft., core, kloedenellid sp. Styliolina spp.
Imperial Formation, GSC Youngiella sp. Tentaculites spp.
locs. C-5282-3 conodont fragments
age: Late Devonian, Frasnian, equivalent to i-fauna
of Imperial Formation of Norman Wells area

Depth 1,463-1,483 ft., core, conodont fragments
Muskwa-Horn River equiv- pyritized sponge spicules
alent, samples retained in hexactinellid triaxons (pyritized)
core goniatite anaptychi

Depth 1,483-1,488 ft., core, palmatolepid conodont fragments
Muskwa-Horn River equiv-
alent, samples retained in
core

Depth 1,494-1,531.5 ft., many fragments of conodont genera like
core, Muskwa-Horn River Palmatolepis, Polygnathus, Hindeodella and others
equivalent, samples retained conodont "bone bed" at 1,529-1,531.5 ft.
in core age: Late Devonian, Frasnian, equivalent to h-fauna
of Canol Formation of Norman Wells area

Depth 1,550-1,574 ft., core, Coelonella sp. Orthocypris sp.
Nahanni Formation, GSC kloedenellid spp. Tentaculites sp.
locs. C-5289-91 Marginia? sp.

- Depth 1,580-1,607 ft. , core, Acratia sp. Microcheilinella spp.
Nahanni Formation, GSC Aparchites sp. Phlyctiscapha sp.
locs. C-5293-5 Hemiaechminoides sp. Sulcella sp.
kloedenellid sp. Uchtovia sp.
- Depth 1,607-1,637 ft. , core, kloedenellid sp. leperditiid sp.
Nahanni Formation, GSC
locs. C-5296-8
- Depth 1,637-1,653 ft. , core, Bairdianella sp. Microcheilinella sp.
Nahanni Formation, GSC kloedenellid sp. Sulcella sp.
locs. C-5299, C-5300 Libumella? sp.
- Depth 1,662-1,706 ft. , core, Bairdianella sp. leperditiid sp.
Nahanni Formation, GSC
locs. C-5301-3
- Depth 1,733-1,750 ft. , core, Aparchites spp. Microcheilinella sp.
Nahanni Formation, GSC Ellesmeria sp. Parapribylites sp.
locs. C-5307-9 Hemiaechminoides sp. Phlyctiscapha sp.
kloedenellid sp. Sulcella sp.
leperditiid sp. Sycidium oogonia
age: interval, 1,550-1,750 ft. , Middle Devonian,
Eifelian, equivalent to b-fauna of lower Hume
Formation of Norman Wells area and to Nahanni
(lower part) and Headless Formations of
southern Mackenzie Mountains
- Depth 1,760-1,834 ft. , core, Acratia sp. leperditiid sp.
Nahanni Formation, GSC Aparchitellina sp. Microcheilinella sp.
locs. C-5311-9; Depth 1,834- Bairdianella sp. Sulcella sp.
1,857 ft. , core, Bear Rock kloedenellid sp. Sycidium oogonia
Formation, GSC loc. age: Middle Devonian, Eifelian, equivalent to b-fauna
C-5320-1 and a-fauna of lower and lowermost Hume
Formation. The composition of the a-fauna of
the Hume-Gossage boundary indicates
restricted-marine to brackish water conditions.
The same a-fauna is also present in the Landry
Formation in certain sections of the southern
Mackenzie Mountains. The mixture of the open-
marine b-fauna and the restricted a-fauna
indicates fluctuations between these two types
of environment of deposition and not a strati-
graphic relationship as in the Norman Wells
area. Compare also Imperial Cartridge F-72,
depths 875-985 ft.
- Imperial Cartridge F-72
63° 11' 19" N. , 120° 29' 04" W. , Figure 1, loc. 7
- Depth 655-659 ft. , core, conodont fragments, siliceous
Fort Simpson Formation and pyritized sponge spicules
GSC loc. C-5396 age: Late Devonian, Frasnian, equivalent to h-fauna
of Canol Formation of Norman Wells area

Depth 785-794 ft. , core,
lower Keg River Formation,
(Lonely Bay Formation),
GSC loc. C-5397

fragments of Styliolina and Tentaculites
age: indeterminate

Depth 799-809 ft. , core,
lower Keg River Formation,
(Lonely Bay Formation)
GSC locs. C-5398-9

Acratia sp.
Aparchites spp.
Bairdia spp.
Bairdiocypris sp.
Bairdianella sp.
Bairdiocypris sp.
Beecherella? sp.
Coelonella sp.

Coeloenellina sp.
Hemiaechminoides sp.
kloedenellid fragments
Libumella sp.
Microcheilinella spp.
Phlyctiscapha sp.
Rectobairdia sp.
Rishona sp.

Depth 809-821 ft. , core,
lower Keg River Formation,
(Lonely Bay Formation)
GSC locs. C-5400-1

Aparchites spp.
Bairdianella sp.
bairdiocyprid fragments
Coelonella sp.
Coeloenellina sp.
Healdianella sp.
Hemiaechminoides sp.
kloedenellid fragments
Libumella sp.

Marginia sp.
Microcheilinella spp.
Phlyctiscapha sp.
Rectobairdia sp.
Rishona sp.
Schmidtella sp.
Sulcicuneus sp.
Uchtovia sp.

age: interval 799-821 ft. , Middle Devonian, Eifelian
to ?Early Givetian, lower sequence of c-fauna
and close to c and b-faunal boundary; equivalent
to lower part of the upper Hume Formation of
Norman Wells area and to the middle part of the
Nahanni Formation of the southern Mackenzie
Mountains

Depth 840-860 ft. , core,
lower Keg River Formation,
(Lonely Bay Formation),
GSC locs. C-5402-5

Acratia sp.
Aparchites spp.
Aparchitellina sp.
Bairdianella spp.
Cryptophyllus sp.
Hemiaechminoides spp.
kloedenellid fragments
leperditiid fragments
Marginia spp.

Microcheilinella spp.
Parabolbina sp.
(fragments)
Phlyctiscapha sp.
Punctaparchites sp.
Sulcella sp.
Uchtovia sp.
Tentaculites sp.

age: Middle Devonian, Eifelian, equivalent to b-fauna
of lower Hume Formation of Norman Wells area,
and to Nahanni (lower part) and Headless For-
mations of southern Mackenzie Mountains.
Compare also I. O. E. - Triad Ebbutt D-50,
depths 1,550-1,750 ft.

Depth 875-914 ft. , core,
upper Chinchaga equivalent,
(Lonely Bay Formation),
GSC locs. C-5406-9

kloedenellid sp.
leperditiid sp.
age: as for above interval

Microcheilinella sp.
Trocholiscus oogonia

- Depth 914-960 ft., core,
upper Chinchaga equivalent,
(Lonely Bay Formation),
GSC locs. C-5410-16
- Acratia sp.
Adelphobolbina sp.
Aparchitellina? sp. (fragments)
Ellesmeria sp.
- Hemiaechminoides sp.
Leperditellina sp.
Sulcella sp.
Uchtovia sp.
- Depth 960-985 ft., core,
upper Chinchaga equivalent,
(Lonely Bay Formation),
GSC locs. C-5417-8
- Aparchites sp. (fragments)
Bairdiocypris sp.
Bairdianella sp. (fragments)
- kloedenellid spp.
Sycidium oogonia
- age: Middle Devonian, Eifelian, equivalent to b-fauna and a-fauna of lower and lowermost Hume Formation; also equivalent to the Nahanni (lower part), Headless and Landry Formations of the southern Mackenzie Mountains. The mixture of the open-marine b-fauna and the restricted a-fauna are very similar to I.O.E. - Triad Ebbutt D-50, depths 1,760-1,857 ft.

Imperial Triad Willow Lake B-28

62° 17' 03" N., 119° 04' 20" W., Figure 1, loc. 11

- Depth 2,003-2,038.5 ft.,
core, Fort Simpson For-
mation, GSC loc. C-5389
- pyritized sponge spicules
conodont fragments
- age: Late Devonian, Frasnian, equivalent to Canol Formation of Norman Wells area
- Depth 2,080-2,099 ft., core,
lower Keg River Formation,
GSC locs. C-5390-2
- Bairdiocypris spp.
Hemiaechminoides? sp.
(fragments)
- Orthocypris sp.
(fragments)
conodont fragments
- age: Middle Devonian, Eifelian to ?Early Givetian, possibly equivalent to lower c-fauna or upper sequence of b-fauna of the Hume Formation of the Norman Wells area

Imperial Sun Arrowhead I-46

60° 45' 37.15" N., 122° 22' 46.96" W., Figure 1, loc. 16

- Depth 6,099-6,115 ft., core,
Fort Simpson Formation,
GSC loc. C-5336
- conodont fragments (including a palmatolepid conodont)
goniatite anaptychi
pyritized sponge spicules
- age: Late Devonian, Frasnian, equivalent to b-fauna of Canol Formation of Norman Wells area
- Depth 6,137.3-6,142 ft.,
core, ?Slave Point For-
mation, GSC locs.
C-5338-9
- Aparchites diuturnus (McGill)
Bairdiocypris cf. B. homolibera (McGill)
Bairdiocypris sp.
Microcheilinella sp. (fragments)
- Depth 6,156-6,202 ft., core,
?Slave Point Formation,
GSC locs. C-5341-5
- Bairdia sp.
Bairdiocypris homolibera (McGill)
Bairdiocypris sp.
Microcheilinella cf. M. boweni (McGill)

- Depth 6, 202-6, 265 ft. , core, shell fragments
?Sulphur Point Formation, Trocholiscus oogonia
GSC locs. C-5346-52
- Depth 6, 265-6, 324 ft. , core, Aparchites diuturnus (McGill)
Sulphur Point Formation, leperditiid? fragments
GSC locs. C-5353-6 Styliolina sp.
- Depth 6, 324-6, 374 ft. , core, Acratia sp. (fragments)
Sulphur Point Formation, Aparchites diuturnus (McGill)
GSC locs. C-5357-9 Bairdia sp. (fragments)
conodont fragment
Bairdiocypris sp.
Bairdiocypris homolibera (McGill)
Bairdiocypris sp.
leperditiid fragments
Libumella sp.
Microcheilinella cf. M. boweni (McGill)
Orthocypris sp.
Phlyctiscapha sp.
- Depth 6, 374-6, 409 ft. , core, Acratia? sp. (fragments)
Sulphur Point Formation, Aparchites diuturnus (McGill)
GSC locs. C-5360-3 Bairdia sp.
Bairdiocypris sp.
Bairdiocypris homolibera (McGill)
Bairdiocypris sp.
Libumella sp. (fragments)
Microcheilinella cf. M. boweni (McGill)
Styliolina sp.
- Depth 6, 419-6, 495.7 ft. ,
core, Pine Point Formation, Aparchites diuturnus (McGill)
GSC locs. C-5364-7 Bairdia sp.
Bairdiocypris sp.
Bairdiocypris homolibera (McGill)
Styliolina sp.
age: for interval 6, 137-6, 496 ft. , Middle Devonian,
Givetian, fauna equivalent to that of the Slave
Point Formation (and possibly the underlying
sequences) of north-central Alberta
- Depth 6, 495.7-6, 537.7 ft. ,
core, Pine Point For- Hemiaechminoides? sp.
mation, GSC locs. Libumella? sp. (fragments)
C-5368-70 Styliolina sp.
Tentaculites sp.
age: Middle Devonian; the presence of a more varied
cricoconarid fauna may indicate a Hare Indian
Formation equivalent; no firm boundaries with
the overlying and the underlying faunas can be
drawn

- Depth 6, 547-6, 605 ft. , core, Aparchites sp.
Pine Point Formation, GSC bairdiid fragments
locs. C-5371-5 Bairdiocypris cf. B. homolibera (McGill)
Bairdiocypris sp.
Beecherella sp.
Coelonella sp.
Hemiaechminoides sp.
Libumella sp. (fragments)
Rectobairdia sp.
Styliolina sp.
Tentaculites sp.
age: Middle Devonian, Eifelian? to Givetian,
probably equivalent to c-fauna of upper Hume
Formation of Norman Wells area
- Depth 6, 605-6, 734 ft. , core, kloedenellid fragments
Pine Point Formation, GSC Microcheilinella sp.
locs. C-5376-82 Phlyctiscapha sp.
age: Middle Devonian, Eifelian, probably equivalent
to b-fauna of lower Hume Formation of Norman
Wells area

Silurian Assemblages by B.S. Norford

Dominion Explorers-Canso et al. Bathurst Caledonian River J-34
75° 33' 31" N. , 98° 43' 00" W. , Bathurst Island, District of Franklin

- Depth 2, 556-2, 557 ft. , core, Linograptus sp.
Cape Phillips Formation, Monograptus aff. M. bugensius (Teller)
GSC loc. C-5204 Monograptus aff. M. chelmiensis (Teller)
- Depth 2, 563-2, 568 ft. , core, Monograptus aff. M. bugensius (Teller)
Cape Phillips Formation, Monograptus transgrediens Perner
GSC loc. C-5206
- Depth 2, 568-2, 572 ft. , core, Linograptus sp.
Cape Phillips Formation, Monograptus transgrediens Perner
GSC loc. C-5208 age: interval 2, 556-2, 572 ft. , Late Silurian, Pridoli

Dome et al. Winter Harbour No. 1
74° 48' 06" N. , 110° 30' 37" W. , Melville Island, District of Franklin

- Depth 9, 790-9, 794 ft. , core, Monograptus sp.
Cape Phillips Formation, Monograptus ex gr. M. spiralis (Geinitz)
GSC loc. C-5209 age: Silurian, Late Llandovery (M. spiralis Zone)
- Depth 9, 801-9, 806 ft. , core, Monograptus sp.
Cape Phillips Formation, Monograptus ex gr. M. spiralis (Geinitz)
GSC loc. C-5210 age: Silurian, Late Llandovery (M. spiralis Zone)

Depth 9, 810-9, 811 ft. , core, Monograptus sp.
Cape Phillips Formation, age: Silurian
GSC loc. C-5211

Depth 10, 997-10, 998 ft. , Monograptus sp.
core, Cape Phillips For- age: Silurian
mation, GSC loc. C-5212

Depth 11, 016-11, 024 ft. , Monograptus sp.
core, Cape Phillips For- Monograptus ex gr. M. priodon (Bronn)
mation, GSC loc. C-5213 ?Retiolites sp.
age: Silurian, Late Llandovery or very early
Wenlock

Ordovician Assemblage by B. S. Norford

F. P. C. Tenneco Root River I-60

62° 39' 32.21" N. , 123° 24' 28.96" W. , Figure 1, loc. 8

Depth 6, 631 ft. , core, Bighornia sp.
GSC loc. C-2520 age: Late Ordovician

Cambrian Assemblage by W. H. Fritz

Shell Keele River L-4

64° 23' 39" N. , 125° 01' 42" W. , Figure 1, loc. 6

Depths 3, 233-3, 255 ft. , core, ?Cambrotypa sp.
GSC loc. 83408-10 Hyolithes sp.
inarticulate brachiopods
Glossopleura sp.
?Polypleuraspis sp.
age: Middle Cambrian, Glossopleura Zone, probably
high in the Zone

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