

FS-028

OF 708

Palynology
of
TRIASSIC AND JURASSIC
FIELD SAMPLES, CORES AND CUTTINGS
from
THE SVERDRUP BASIN OF ARCTIC CANADA

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9144

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INTRODUCTION

The palynological assemblages of 7 field samples from Borden Island, N.W.T. and Yelverton Lake, together with 72 core samples and cuttings from various locations in the Sverdrup Basin are reported on here.

The core samples are from Amund Central Dome H-40, core 1, core 2/3; Cape Norem A-80 core 1; Depot Point L-24 core 1; Dome Bay P-36 core 1, core 2; Drake Point F-16 core 5; Drake Point L-67 core 2; East Amund M-05 core 1 and core 2; Emerald K-33 core 3 and core 4; Graham C-52 core 3 consisting of an upper and lower sample; Isachsen J-37 core 1 and core 2; King Christian N-06 core 2, core 3 and core 4; Kristoffer Bay B-06 core 3; Louise O-25 core 2; May Point H-02 core 1 and core 2; Mid Fiord J-53 core 1; Pollux G-60 core 1 and core 2; Sandy Point L-46 core 2; Satellite F-68 core 1, core 2, and core 3; Sherard Bay F-14 core 2; Sutherland O-23 core 1 and core 3; Taleman J-34 core 1 and core 2; W. Hecla P-62 core 1/2; and Wilkins E-60 core 2.

The 35 cuttings samples examined from Cape Norem A-80 are listed under the individual sample discussion.

The results are summarized overleaf (see Table 1 and Chart 1) and are discussed in detail in the following section. The palynomorphs recorded from each sample are listed in the appendix.

Many different assemblages are present including Scythian, Anisian, Ladinian, Karnian, Norian, Rhaetian, Liassic, Oxfordian-Kimmeridgian and several transitional floras.

It is possible that the Norian samples are in fact slightly younger. Marine samples containing a very distinctive and usually prolific suite of

dinoflagellates were first described in detail by Bujak and Fisher (1976) and they considered them to be of Norian age. The samples examined here contain similar assemblages. Dinoflagellates are generally associated with Rhaetian spores and pollen which may indicate a rather younger age than Bujak & Fisher postulate. A Rhaeto-Norian age may prove to be more appropriate, but until this suite is studied further a Norian age must be assigned to the samples in this report.

The problem of precise correlation with the international standards is not confined to the "Norian". Insufficient systematic work has been done in the Arctic on earlier Triassic microfloras and their relationship to the macrofaunas. Until such a project is carried out, the correlation of many of the assemblages found in the Arctic Triassic must remain tentative since many of the ranges are not fully known. Critical to such a project would be an examination of palynofloras from well dated sections or even the matrices of diagnostic macrofossils.

Table 1

SUMMARY OF RESULTS

	<u>Location</u>		<u>Age</u>	<u>Environment of Deposition</u>
A. <u>FIELD SAMPLES</u>				
Borden Island, N.W.T.				
1.	77-BAA-024	C-75984	Sinemurian	Slight marine influence
2.	77-BAA-026A	C-75986	Early Jurassic (undiff)	" " "
Yelverton Lake				
3.	75-WR-10/7	C-55364	Early Jurassic (undiff.)	" " "
4.	75-WR-10/8	C-55365	Probably Early Jurassic	" " "
5.	75-WR-10/10	C-55367	Probably Early Jurassic	" " "
6.	75-WR-11/1	C-55369	Late Oxfordian/early Kimmeridgian	Marine
7.	75-WR-11/2	C-55370	Late Oxfordian/early Kimmeridgian	Marine
B. <u>CORE SAMPLES</u>				
Amund Central Dome H-40				
8.	Core 1, 5169-5190'	C-46845	Norian	Marine
9.	Core 2 & 3, 9060'-9121'	"	Late Scythian/ early Anisian	Slight marine influence
Cape Norem A-80				
10.	Core 1, 5505-40	C-30200	Norian	
11 - 35 cuttings samples from 4990' - 8790'. For further details see Cape 45. Norem sample descriptions.				
Depot Point L-24				
46.	Core 1, 8776-8806	C-38246	Scythian (undiff.)	Marine

Table 1 (Cont.)

	<u>Location</u>		<u>Age</u>	<u>Environment of Deposition</u>
	Dome Bay P-36			
47.	Core 1, 7053-73'	C-46847	Liassic	Slight marine influence
48.	Core 2, 8020-40'	"	Latest Rhaetian/ earliest Hettangian	" " "
	Drake Point F-16			
49.	Core 5, 3720-80'	C-67700	Norian	Marine
	Drake Point L-67			
50.	Core 2, 4737-96'	C-30239	Anisian	Non-marine
	East Amund M-05			
51.	Core 1, 5840-61'	C-80210	Rhaetian or earliest Liassic	? Marine
52.	Core 2, 7362-92'	"	Indet.	Marine
	Emerald K-33			
53.	Core 3, 5420-58'	C-30844	Anisian	Non-marine
54.	Core 4, 7140-60'	"	Mid-Scythian	Non-marine
	Graham C-52			
55.	Core 3, 5252-82' a. top shale	C-46846	Latest Rhaetian or earliest Hettangian	Marine
56.	b. bottom siltstone	"	Indet.	Marine
	Isachsen J-37			
57.	Core 1, 3344-72'	C-67946	Early Karnian	Marine
58.	Core 2, 5437-57'	"	Late Spathian	Marine
	King Christian N-06			
59.	Core 2, 6643-96'	C-39376	Late Scythian/ early Anisian	Marine
60.	Core 3, 9566-95'	"	Late Scythian	Marine

Table 1 (Cont.)

	<u>Location</u>		<u>Age</u>	<u>Environment of Deposition</u>
	King Christian N-06			
61.	Core 4, 10,989- 11,020'	C-39376	Scythian, possible Smithian	Marine
	Kristoffer Bay B-06			
62.	Core 3, 9446-70'	C-48846	Norian	Marine
	Louise O-25			
63.	Core 2, 7464-83'	C-64330	Indet.	Indet.
	May Point H-02			
64.	Core 1, 8748-73'	C-51809	Early Liassic	Marine
65.	Core 2, 9500-20'	"	Latest Rhaetian or earliest Hettangian	Slight marine influence
	Mid Fiord J-53			
66.	Core 1, 6475-6515'	C-48832	Sinemurian	Marine
	Pollux G-60			
67.	Core 1, 2584-2604'	C-80208	Late Karnian/early Norian	Marine
68.	Core 2, 4500-30'	"	Late Ladinian	Marine
	Sandy Point L-46			
69.	Core 2, 2525-55	C-30224	Norian	Marine
	Satellite F-68			
70.	Core 1, 2090-2110'	C-58206	Norian	Marine
71.	Core 2, 3667-87'	"	Scythian/Anisian	Marine
72.	Core 3, 5797-5817'	"	Scythian, probably Dienerian	Slight marine influence
	Sherard Bay F-14			
73.	Core 2, 3900'	C-80209	Rhaetian	Slight marine influence

Table 1 (Cont'd)

	<u>Location</u>		<u>Age</u>	<u>Environment of Deposition</u>
	Sutherland O-23			
74.	Core 1, 2808 - 33	C-80207	Early Liassic	Non marine
75.	Core 3, 11,636 - 11,658'	"	Griesbachian/ Dienerian	Marine
	Taleman J-34			
76.	Core 1, 6175-6205'	C-39239	Probably early Liassic	Marine
77.	Core 2, 9817-77'	"	Latest Scythian or earliest Anisian	Non-marine
	W. Hecla P-62			
78.	Core 1 & 2, 3390- 3450'	C-80211	Anisian	Slight marine influence
	Wilkins E-60			
79.	Core 2, 3432-62'	C-30221	Late Ladinian	Marine

INDIVIDUAL SAMPLE

DESCRIPTION, AGE AND ENVIRONMENT

- A. FIELD SAMPLES

- B. CORE SAMPLES
(in alphabetical order)

A. FIELD SAMPLES

BORDEN ISLAND, N. W. T.

Sample No. 77-BAA-024

C-75984

Age: Sinemurian

Environment: Slight marine influence

Remarks: An extremely rich and diverse spore/pollen assemblage is intermixed with some inerturite and organic debris. Palynomorphs are yellow or brown and the preservation is fair to good. A large number of species is present, the majority of which are typical of the Liassic (pre-Late Pleinsbachian). Large bisaccates are common and include *Alisporites grandis*, *A. radialis*, *A. robustus*, *Platysaccus* sp., *Chordasporites platysaccus*, *C.* sp., *Schizocystia* cf. *rara* and other undescribed forms. Other pollen often found in the Lower Jurassic includes *Callialasporites turbatus*, *Cerebro-pollenites* sp., *Perinopollenites elatoides*, *Quadraeculina anellaeformis* and several representatives of the genus *Pinuspollenites*.

Significant spores include common *Lycopodiunsporites austroclavatidites* and *L. semimuris* and rare *Stereisporites cicatricosus* both of which are typical of the Lower Liassic.

Rare specimens of *Micrhystriidium* are present and a single example of the dinoflagellate *Pareodinia*. This genus first occurs in the mid-Sinemurian and extends throughout the Jurassic. The lack of typical Late Pleinsbachian dinoflagellates indicates a pre Pleinsbachian age. A Sinemurian age is therefore proposed. Pocock (in press) has recorded similar assemblages of pollen and spores from the Hettangian of the Sverdrup Basin.

BORDEN ISLAND, N. W. T.

Sample No.: 77-BAA-026A C-75986

Age: Early Jurassic, undifferentiated

Environment: Slight marine influence

Remarks: This sample is characterised by abundant inertinite, a few woody fragments and rare, poorly preserved spores, pollen, acritarchs and possible dinoflagellates. This depleted assemblage contains several long-ranging forms but the presence of rare specimens of *Lycopodiumsporites austro-clavatidites*, *L. semimuris*, and *classopollis* sp. suggests a Jurassic rather than Triassic age. Rare marine indicators include *Micrhystridium* sp. and an occasional microfossil resembling a dinoflagellate. An Early Jurassic, pre late Pliensbachian age is tentatively assigned to the sample.

YELVERTON LAKE

Sample No.: 75-WR-10, 7 C-55364

Age: Early Jurassic, undifferentiated

Environment: Slight marine influence

Remarks: Brown organic matter, inertinite and some very poorly preserved spores, pollen and acritarchs are present in this sample. Of the few species identified, *Lycopodiumsporites* sp. and *Classopollis* sp. suggest an Early Jurassic age. *Contignisporites problematicus* is the only other common spore in the assemblage, but as it is relatively long-ranging it does not help to refine the Early Jurassic date assigned to the sample.

Sample No.: 75-WR-10, 8, 10.

C-55365 and C-55367

Age: Probably Early Jurassic

Environment: Slight marine influence

Remarks: The palynological residue in these two samples is grossly similar in composition to the Early Jurassic assemblage from the underlying sample (75-WR-10, 7). However, the only spore and pollen species recorded are the long ranging forms *Lycopodiumsporites austroclavatidites*, *Stereisporites cicatricosus* and *Cerebropollenites mesozoicus*. Rare representatives of the genus *Micrhystridium* are present and also a possible dinoflagellate. Because of the similarity of the residues and the proximity to the underlying early Jurassic sample, the same age is assigned to these samples.

Sample No.: 75-WR-11, 1

C-55369

Age: Late Oxfordian - early Kimmeridgian

Environment: Marine.

Remarks: This sample contains abundant comminuted and degraded brown organic matter, some inertinite and plant tissue. Spores and pollen are abundant but most of the specimens are too pyretised and degraded to identify. Dinoflagellates are abundant and belong to the genera *Gonyaulacysta*, *Pareodinia* and *Psaligonyaulax*, the later being rare. *Pareodinia capillosa* is dominant but *P. cf. borealis* and other species are present. These species together indicate a Late Oxfordian or early Kimmeridgian age (Brideaux 1977, Brideaux and Fisher 1976).

Sample No.: 75-WR-11,2

C-55370

Age: Late Oxfordian - early Kimmeridgian

Environment: Marine

Remarks: The preservation of this sample is similar to the previous one (75-WR-11,1). Spores and pollen are again abundant but cannot be identified because of poor preservation. Dinoflagellates are abundant, but less so than in the previous sample, and are not as well as preserved. Specimens of *Gonyaulacysta* spp. predominate with *Pareodinia capillosa* occurring infrequently. A Late Oxfordian - early Kimmeridgian age is also assigned to this sample.

B. CORE SAMPLES

AMUND CENTRAL DOME H-40

Depth: 5169 - 90' Core 1

C-46845

Age: Norian

Environment: Marine

Remarks: This sample contains finely comminuted inertinite mixed with spores, pollen and dinoflagellates which are strongly carbonized or very dark brown. However, it is still possible to identify some of the species present.

Abundant representatives of the dinoflagellate genus *Sverdrupiella* suggest the sample is of Norian age. The spore/pollen assemblage which includes *Corollina* sp., *Limbosporites lundbladii*, *Lunatisporites rhaeticus*, *Ovalipollis ovalis*, common *Riccisporites tuberculatus* and *Zebbrasporites*

laevigatus, is typical of the assemblage which Fisher and Bujak (1975) found amongst and immediately above this dinoflagellate zone in Arctic Canada. Rare specimens of *Brachysaccus* sp. and *Granosaccus ornatus* are assumed to be vestiges of the Late Karnian. A Norian age is assigned.

AMUND CENTRAL DOME H-40

Depth: 9060 - 9121' Core 2 and 3 C-46845

Age: Late Scythian/early Anisian

Environment: Marginal marine

Remarks: Abundant inertinite and carbonized plant debris is associated with rare spores and pollen and even rarer acritarchs in this sample. The few specimens which have escaped total carbonization give an ambiguous age. Rare *Sverdrupiella* spp. and cf. *Corollina* sp. suggest a Norian age, but these are most probably mud contaminants since their preservation is slightly better than the bulk of the assemblage.

The presence of a significant number of specimens of *Lunatisporites* spp. together with a rare *Protohaploxypinus* sp. and *Nevesisporites limatulus* suggests a Scythian age. However, a specimen of *Infernopollenites* suggests a strong Anisian influence. A tentative age for Core 2 and 3 is therefore given as late Scythian/early Anisian.

CAPE NOREM A-80

Samples examined: 35 cuttings samples were examined at approximately regular intervals from 4990' to 8790'. These included: 5090', 5200', 5300', 5390', 5590', 5720', 5790', 5900', 6010', 6110', 6190', 6290', 6400', 6490', 6620', 6720', 6810', 6900', 7010', 7070', 7180', 7340', 7510', 7670', 7740', 7880', 7990', 8090', 8190', 8310', 8490', 8610', and 8730'. Core 1 at 5505-40' was also examined.

Ages: ?Rhaetian to Scythian.

Remarks:

4990 - 5200', ?Rhaetian

These three samples are tentatively assigned a Rhaetian age based on the presence of rare specimens of *Limbosporites lundbladii*, *Ovalipollis breviformis* and possible *Riccisporites* sp. and *Zebrasporites* sp. However, a slightly older date cannot be discounted because *Brachysaccus* sp., *Paracirculina scurrilis* and *Granosaccus* sp. are present, although very rare.

All three samples contain abundant cavings consisting chiefly of Jurassic dinoflagellates, spores and pollen.

5300 - 5720' Norian

Core 1 (5505 - 40') is the only sample which yielded a reliable assemblage, so this is discussed first.

Abundant dinoflagellates belonging to the genera *Sverdrupiella*, *Noricysta* and *Hebecysta* suggest that the Core 1 sample belongs to the Norian Suite described by Bujak and Fisher (1976). Abundant tetrads of a laevigate form of *Riccisporites* are present. Rare specimens of *Brachysaccus* sp.

cf. *Patinasporites* and *Triadispora* sp. may indicate a slight Karnian influence. A Norian age is assigned to this core.

The 2 core cuttings samples immediately above Core 1 (i.e. 5300' and 5390') yield rare specimens of *Sverdrupiella* again indicating a Norian age. Also present in the sample from 5300' are Rhaetian species which are often associated with the *Sverdrupiella* suite i.e., *Camarozorosporites rudis*, *Cingulizonates rhaeticus*, *Lunatisporites rhaeticus* and *Semiretisporis gothae*, but these could be caved.

The two samples below Core 1 (5590' and 5720') are also probably Norian. Fisher and Bujak (1975), who studied slightly different cuttings composites from those studied here, were able to place the Karnian - Norian boundary at approximately 5750'.

5790' - 8310' Age indet.

Below Core 1 most samples yield very impoverished Triassic assemblages and some failed to yield even a single Triassic palynomorph (i.e., 6620', 6720', 6900', 7010' 7070', 7740'). Caved material from the Late Pleinsbachian to early Toarcian is overwhelmingly abundant in the majority of samples. *Cerebropollenites mesozoicus* and the dinoflagellates *Nannoceratopsis gracilis*, *N. senex*, *Mancodinium semitabulatum*, *Gonyaulacysta* spp. and *Pareodinia ceratophora* are especially noticeable.

No further reliable Triassic assemblages are present between Core 1 and the Scythian assemblage (8730', 8790')

8490' - 8790' Scythian

The assemblages from 8730' and 8790' although again contaminated are definitely Scythian. Both contain common *Lunatisporites novimundi* and other taeniate forms e. g., *L. hexagonalis*, *L. albertae* and *Protohaploxy-pinus* spp. The lower assemblage also contains *Aculeisporites variabilis*, "*Dulhuntyispora*" *minuta*, *Nevesisporites limatulus* and *Kraeuselisporites* sp., together with frequent *Micrhystridium* specimens. As *Nevesisporites limatulus* is present a Smithian age is tentatively proposed for 8790'.

It is uncertain at which point the Scythian/Anisian boundary occurs, but samples from 8490', and 8610' are almost certainly Scythian as a sample from 8395' yielded an early Smithian assemblage (see Ford, 1978 I.S.P.G. Report).

DEPOT POINT L-24

Depth: 8776' - 8806' Core 1

C-38246

Age: Scythian - undifferentiated

Environment: Marine

Remarks: This sample contains abundant inertinite, numerous acritarchs chiefly belonging to the genus *Micrhystridium*, and common spores and pollen which are dark brown and very poorly preserved. Most noticeable are representatives of the genera *Lunatisporites* and *Kraeuselisporites*. The abundant *L. novimundi* and occasional *L. hexagonalis* are typical of the Scythian (Jansonius 1962) and the other constituents of this rather depleted assemblage support this date.

DOME BAY P-36

Depth: 7053' - 7073' Core 1

C-46847

Age: Liassic

Environment: Slight marine influence

Remarks: Infrequent, poorly preserved spores and pollen are interspersed with inertinite. Several forms indicate a Liassic age e.g., *Alisporites* cf. *grandis*, *Annulispora*, and *Lycopodiumsporites* sp. No definite Rhaetian species occur, and only one indeterminate dinoflagellate is present. An undifferentiated Liassic age is proposed.

DOME BAY P-36

Depth: 8020' - 8040' Core 2

C-46847

Age: Late Rhaetian/earliest Hettangian

Environment: Slight marine influence

Remarks: Palynomorphs are common although they are usually carbonized, corroded and indeterminate. A few Rhaetian forms are present including *Corollina meyeriana*, the upper Rhaetian spore *Triancorcesporites reticulatus* and large carbonized, verrucate forms which are probably *Riccisporites tuberculatus*. A specimen of the dinoflagellate *Suessia* cf. *swabiana* is present. Morbey records the species throughout the Rhaetian.

Associated with these are a number of forms indicating a Liassic age e.g., *Lycopodiumsporites* spp. *Polycingulatisporites* sp. and *Stariesporites* sp.

Very rare Norian dinoflagellates are assumed to be reworked.

A latest Rhaetian or earliest Hettangian age is proposed for this core.

DRAKE F-16

Depth: 3720' - 3780' Core 5

C-67700

Age: Norian

Environment: Marine

Remarks: This core sample contains abundant dark brown woody debris and common, fairly well preserved spores, pollen and dinoflagellates. The abundant dinoflagellates belong to the genera *Sverdrupiella* and *Heibergella* described by Bujak and Fisher (1975) from what they regard as Norian in the Arctic. At least 5 species of *Sverdrupiella* are present but *S. mutabilis* is the most abundant. *Heibergella* species are also common. The spore/pollen assemblage consists of several Rhaetian forms which are often found associated with the *Sverdrupiella* complex. They include *Limbosporites lundbladii*, *Ovalipollis ovalis*, *Riccisporites tuberculatus*, *Lunatisporites rhaeticus* and *Triancoraesporites ancorae*. Rare specimens of *Granosaccus ornatus* and *Parcisporites annectus* are remnant specimens from the assemblage below the dinoflagellate suite. A hint of Liassic influence is indicated by rare specimens of *Lycopodiumsporites* cf. *austroclavatidites*, *Stereisporites* cf. *perforatus*, *S. stereoides* and *Annulispora folliculosa*.

DRAKE POINT L-67

Depth: 4737' - 4796' Core 2

C-30239

Age: Anisian

Environment: Non marine

Remarks: A rich non-marine assemblage of spores and pollen is intermixed with abundant yellow and brown plant tissue. Abundant *Striatoabieites*

aytugii and *Protodiploxypinus gracilis* together with frequent *Triadispora stabilis* and other species of *Triadispora* (i.e., *T. aurea*, *T. obscura*) indicate an Anisian or Ladinian age. However, the lack of *Ovalipollis* suggests a pre-Ladinian age. Also present are specimens of *Corisaccites* sp., *Infermopollenites* spp., *Lunatisporites acutus*, and *L. multiplex* which are compatible with an Anisian age.

EAST AMUND M-05

Depth: 5840' - 5861' Core 1.

C-80210

Age: Rhaetian or earliest Liassic

Environment: Indet. possibly marine

Remarks: This sample contains abundant highly carbonized plant tissue and frequent palynomorphs, but the preservation is so poor that the majority cannot be identified. A single specimen of *Limbosporites* cf. *lundbladii* indicates an Upper Triassic or younger age. This species is most common in the Rhaetian in the Arctic (Fisher and Bujak 1975) and in Europe, although it does sometimes extend into the Lower Liassic (Lund, 1977, Morbey 1975). A Rhaetian or earliest Liassic age is therefore proposed.

EAST AMUND M-05

Depth: 7362' - 7392' Core 2

C-80210

Age: Indeterminate

Environment: Marine

Remarks: A few completely carbonized palynomorphs are present in a background of comminuted inertinite. Rare acritarch specimens belonging to the genus *Micrhystridium* suggest a marine environment of deposition but the age is indeterminate.

EMERALD K-33

Depth: 5420' - 5458 Core 3

C-30844

Age: Anisian

Environment: Non-marine

Remarks: Core 3 contains inertinite, brown organic debris and thin degraded and fragmented palynomorphs. No marine indicators are present. The assemblage includes abundant *Striatoabieites aytugii* and *S.* spp. which suggest an Anisian or Ladinian age. Pollen with small sacchi referable to *Protodiploxypinus* cf. *gracilis* is also common. Scheuring (1970) records *P. gracilis* from the Ladinian and Karnian of Europe. Geiger & Hopping use *Minutosaccus potoniei* which is another similar form with reduced sacchi, as a marker for the Anisian and Ladinian of the N. Sea Basin.

Rare specimens of *Infernopollenites* spp, and *Lunatisporites* cf., *Krauseli* are also present, both of which are compatible with an Anisian or Ladinian age. *Nevesisporites limatulus*, which generally dies out in the early Anisian, is common here. This may indicate an Anisian rather than a Ladinian age for this sample.

EMERALD K-33

Depth: 7140' - 7160' Core 4

C-30844

Age: Mid-Scythian

Environment: Non-marine

Remarks: Core 4 contains yellow-brown organic matter, some inertinite and much large striate pollen which is fairly well preserved. The assemblage is typical of the Scythian with the genera *Lunatisporites* and *Protohaploxy-pinus* well represented. *Lunatisporites novimundi* is common whereas *L. pellucidus* and *L. sp. V.* (Jansonius 1962) are both rare. *Protohaploxy-pinus samoilovichii* is abundant and other representatives of the genus are also present. *Aratrisporites strigosus* and *Densoisporites nejburgii* are both common which suggests a younger Scythian age. Rare specimens of *Equisetosporites steevesi*, usually abundant in the early Scythian, are present but another undescribed species of *Equisetosporites* is common. The significance of this is uncertain.

Permian pollen belonging chiefly to the genus *Protohaploxy-pinus* is common, perhaps indicating the proximity to an area of active erosion. A mid Scythian age is proposed.

GRAHAM C-52

Depth: 5252' - 5282' Core 3

C-46846

Age: Latest Rhaetian or earliest Hettangian

Environment: Marine

Remarks: A very rich and diverse, although not well preserved assemblage is present in the grey shale at the top of Core 3. Plant tissue,

large bisaccates and spores are abundant. Many Rhaetian species commonly found in the Arctic are present e.g., *Cingulizonates rhaeticus*, *Corollina* sp., *Lunatisporites rhaeticus*, *Semiretisporis gothae*, *Zebrasporites inter-scriptus* and *Z. laevigatus*. Many of the species in the assemblage range from the Rhaetian to Liassic i.e., *Iraquispora laevigata*, *I. speciosa*, *Limbosporites lundbladii* and others. Several species in the sample indicate a younger influence i.e., Hettangian, but they are all rare. They are *Alisporites grandis*, *Lycopodiumsporites seminuris*, *Stereisporites* sp.

Particularly interesting are the common dinoflagellates which appear to be an undescribed form. Also present are rare forms similar to *Rhaetogonyaulax* sp. and *Dapcodinium* sp. The former is usually restricted to the Rhaetian but *D. priscum* occurs all through the Rhaetian and persists into the early Hettangian (Morbey & Neves 1975).

A latest Rhaetian or earliest Hettangian age is proposed.

GRAHAM C-52

Depth: 5252' - 5282' Core 3

C-46846

Age: Indet.

Environment: Marine

Remarks: The mottled siltstone near the base of Core 3 yielded inertinite fragments and some carbonized sporomorphs. A few specimens of *Micrhystri-dium* are present indicating some marine influence but no date can be assigned to this sample.

ISACHSEN J-37

Depth: 3344' - 3372' Core 1

C-67946

Age: Early Karnian

Environment: Marine

Remarks: Core 1 contains a sparse, although quite diverse association of spores and pollen which are fairly well preserved. Some inertinite and brown organic matter is intermixed.

Acritarchs form 70% of the total assemblage and belong to the genera *Micrhystridium* and *Veryhachium*. Pollen with reduced sacchi assigned to the genera *Granosaccus* and *Protodiploxypinus* is the dominant morphological type. *Granosaccus ornatus*, which is rare here, characteristically occurs in Karnian sediments in the Arctic. Common specimens resembling *Protodiploxypinus gracilis* suggest a Ladinian or Karnian age (Scheuring). Rare specimens of *Infernopollenites*, *Ovalipollis* and cf. *Rimaesporites* are present but the absence of *Striatoabieites* favours a post Ladinian age. The genus *Camerosporites* is generally taken to be a Karnian marker but as there are only rare specimens in this sample an early Karnian age is suggested.

ISACHSEN J-37

Depth: 5437' - 5457' Core 2

C-67946

Age: Late Spathian

Environment: Marine

Remarks: This sample is rich in sapropel and has a diverse assemblage

of thin and often poorly preserved spores and pollen. Abundant acritarchs belonging to the genus *Mirchyristridium* indicate a marine environment. Taeniate forms are dominant, indicating a Lower Triassic age. At least 4 species of *Lunatisporites* are present of which *L. cf. transversundatus* is the most common, whereas *L. multiplex*, *L. noviaulensis* and *L. pellucidus* are all rare.

L. transversundatus is found in the Scythian in Canada (Jansonius 1962) but similar forms extend into the Middle Triassic in Australia (Balme 1970). *L. multiplex* and *L. pellucidus*, represent an Anisian influence in the sample. Two representatives of *Protohaploxylinus* are present, although in small numbers. *P. samoilovichii* typical of the Arctic Scythian is less common than a form resembling an un-named species recorded by Scheuring (1970). This again suggests an Anisian influence, but the lack of *Striatoabietites* in this bisaccate rich sample indicates a pre Anisian age.

Significant numbers of *Aratrisporites* occur including *A. fisheri* and *A. tenuispinosus*. This genus first becomes numerous in the Late Scythian in W. Australia (Dolby & Balme 1976) indicating a similar age for this sample. Other spores present include *Densoisporites nejburgii*, *Krauselisporites apiculatus*, *Lundbladispota* spp., *Polypodiumsporites* sp., *Uvaesporites* sp., and common cf. *Foveotriletes* sp.

Rare specimens of cf. *Accinctisporites* sp., *Lueckisporites* cf. *triassicus* and cf. *Vestigisporites* represent a further Anisian influence. A Late Spathian age is therefore postulated.

KING CHRISTIAN N-06

Depth: 6643' - 6696' Core 2

C-39376

Age: Probably Late Scythian/early Anisian

Environment: Marine

Remarks: This is a very poorly preserved assemblage containing black debris together with rare, corroded and carbonized palynomorphs. The depleted assemblage includes *Lunatisporites* cf. *noviaulensis* and *L.* cf. *pellucidus* which suggests a Late Scythian or Anisian age. A single *Aratrisporites* resembling *A. paenulatus* supports this date. The acritarch *Microhystridium* is rare, and large completely carbonized spores may be the result of reworking.

KING CHRISTIAN N-06

Depth: 9566 - 9595' Core 3

C-39376

Age: Late Scythian

Environment: Marine

Remarks: Very poorly preserved, carbonized spores and pollen are associated with abundant acritarchs belonging chiefly to the genus *Microhystridium*, although *Veryhachium* spp. and *Leofusa jurassica* are both common. A Scythian age is indicated by the striate forms *Lunatisporites novimundi/noviaulensis* and *L. hexagonalis*. Other Scythian forms are rare. Specimens of *L.* cf. *pellucidus*, *Polycingulatisporites* sp. and *Striatoabieites* spp., although rare, may indicate an Anisian influence.

KING CHRISTIAN N-06

Depth: 10,989' - 11,020' Core 4 C-39376

Age: Scythian, possibly Smithian

Environment: Marine

Remarks: Like Cores 2 and 3, this core contains a sparse, very poorly preserved, heavily pyritized assemblage. Especially noticeable are strongly pyritized, short spined *Micrhystridium* specimens. The total assemblage indicates a Scythian age as it contains several representatives of *Lunatisporites*. The presence of *Aratrisporites tenuispinosus* and *Nevesisporites limatulus* suggests an upper Scythian age (Dolby and Balme 1976) although a single specimen of *Equisetosporites steevesi* which typifies the lower Scythian is also present.

KRISTOFFER BAY B-06

Depth: 9446' - 9490' Core 3 C-48846

Age: Norian

Environment: Marine

Remarks: Spores and pollen are common but very poorly preserved, with the majority being carbonized or dark brown. Much woody material is present. Occasional dinoflagellates belonging to the genera *Hebecysta*, *Noricysta* and possibly *Sverdrupiella* are associated with Rhaetian palynomorphs i.e. *Lunatisporites rhaeticus* and possibly *Limbo-sporites lundbladii* and *Ricci-sporites tuberculatus*. More frequent forms in this impoverished assemblage are *Apiculatisporites* spp., *Alisporites* spp., and *Vitreisporites*

pallidus, none of which is stratigraphically useful. A specimen of *Lycopodiumsporites* sp., may indicate a younger influence.

A Norian age is assigned to this core.

LOUISE O-25

Depth: 7464' - 7483' Core 2 C-64330

Age: Indeterminate

Environment: Indeterminate

Remarks: This sample contains finely comminuted inertinite and carbonized sporomorphs which are unrecognizable.

MAY POINT H-02

Depth: 8748' - 8773' Core 1 C-51804

Age: Early Liassic

Environment: Marine

Remarks: Core 1 contains abundant plant debris of all sizes, together with some inertinite and sapropel. Spores, pollen and dinoflagellates are infrequent. The former are non-diagnostic except for a specimen of *Lycopodiumsporites* which suggests a Jurassic rather than Triassic age. It is the dinoflagellates, probably belonging to the genus *Nannoceratopsis*, which are the most useful age indicators. This genus ranges from the lower Hettangian into the Upper Jurassic, but the lack of Late Pleinsbachian dinoflagellates suggests an older age.

A distinctive undescribed microfossil only found in Taleman Core 1 is also present perhaps suggesting a similar age for this core.

It is possible that Core 1 is younger than Hettangian as no specimens of *Dapcodinium* are present.

MAY POINT H-02

Depth: 9500' ~ 9520' Core 2 C-51804

Age: Latest Rhaetian or earliest Hettangian

Environment: Slight marine influence.

Remarks: Core 2 contains much inertinite, some brown plant matter, poorly preserved spores, pollen and a few dinoflagellates.

Many typical Rhaetian forms are present including *Camerozonosporites rudis*, *Cingulizonates rhaeticus*, *Limbosporites lundbladii*, abundant tetrads of *Riccisporites tuberculatus* and *R. sp.*, *Triancoraesporites ancorae* and *Zebrasporites interscriptus*. Especially noticeable in the assemblage are *Semiretisporis gothae* and *S. maljavkinae* which usually occur in the upper Rhaetian to Hettangian (Lund 1977, Morbey 1975).

The dinoflagellate genus *Rhaetogonyaulax*, which typically occurs throughout the Rhaetian elsewhere, is rare here. The questionable specimen of *Nannoceratopsis* and rare specimen of *Lycopodiumsporites* sp. may indicate an early Jurassic influence, but the bulk of the assemblage is Late Rhaetian in character.

MID FIORD J-53

Depth: 6475' - 6515' Core 1

C-48832

Age: Sinemurian

Environment: Marine

Remarks: This sample contains mostly inertinite although very poorly preserved, dark brown spores, pollen and dinoflagellates are common. Several Rhaetian species are present i.e., cf. *Cingulizonates* sp., *Limbosporites lundbladii*, *Lunatisporites rhaeticus*, and *Zebrasporites* spp. These are associated with a group of younger forms, e.g. *Alisporites grandis*, *Stereisporites cicatricosus*, cf. *Quadraeculina* sp. which suggest an early Liassic age. The common apiculate and granulate spores and large forms of *Aratrisporites* support this age. *Micrhystridium* spp. are frequent and include at least 3 species. Small double-walled dinocysts resembling the Norian genera *Hebecysta* and *Noricysta* are abundant and probably represent reworking. A Sinemurian age is proposed for this core.

POLLUX G-60

Depth: 2584' - 2604' Core 1

C-80208

Age: Late Karnian/early Norian

Environment: Marine

Remarks: This is a poorly preserved assemblage containing abundant spropel, some inertinite and thin palynomorphs, acritarchs and dinoflagellates. Microplankton are frequent and although most are indeterminate, some resemble the Norian genera *Noricysta* and *Hebecysta*. No *Sverdrupiella* species

are present which suggests Core 1 is somewhat older than the *Sverdrupiella* assemblage described by Bujak and Fisher (1976). There are however some Rhaetian spores present although they are rare, e.g., *Zebrasporites interscriptus*, *Riccisporites tuberculatus* and tetrads of cf. *Rhaetipollis* sp. These may be contaminants. It is interesting to note that Fisher and Bujak (1975) record many Rhaetian forms from their Norian dinoflagellate zone.

Late Karnian species form a significant part of the assemblage. They include *Brachysaccus* sp., cf. *Camerosporites* sp., *Granosaccus ornatus*, *Triadispora* spp., and tetrads of *Paracirculina quadruplicis*.

Corollina meyeriana is common here and represents a Norian influence along with the dinoflagellates. This sample is therefore dated as Late Karnian/early Norian in age.

POLLUX G-60

Depth: 4500' - 4530' Core 2 C-80208

Age: Late Ladinian

Environment: Slight marine influence.

Remarks: This sample is very rich in sapropel but contains sparse, usually very thin spores and pollen. Acritarchs belonging to the genus *Microhystriidium* and *Veryhachium* are rare. Abundant *Striatoabieites aytugii* indicates an Anisian or Ladinian age, although this species ranges further up into the Keuper (Scheuring) in Europe. As *Ovalipollis* is also present a Ladinian age seems more likely. Other species in the assemblage include questionable specimens of *Camerosporites* and *Pseudoenzonalasporites* and a specimen of *Protodiploxypinus* sp. all of which suggest a younger influence. This core is probably Late Ladinian in age.

SANDY POINT L-46

Depth: 2525' - 2555' Core 2

C-30224

Age: Norian

Environment: Marine

Remarks: Core 2 contains much sapropel, inertinite and carbonized plant tissue together with poorly preserved spores, pollen and dinoflagellates.

The dinoflagellates belong chiefly to the genus *Noricysta* although rare specimens of *Hebecysta* are present. Bujak & Fisher, 1976, described these forms from what they regard as the Norian of the Arctic. *Sverdrupia* is absent from this sample but sometimes all three genera occur together (Bujak & Fisher 1976).

The associated spores and pollen indicated an U. Karnian and Rhaetian age respectively. U. Karnian forms, all of which are rare, include *Granosaccus ornatus*, *Camerospurites secatus*, *C. pseudoverrucatus* and *Paracirculina scurrilis*. Many Rhaetian forms are present often united in tetrads. A laevigate tetrad form of *Riccisporites* is abundant and other tetrads include *Corollina meyeriana*, *Granuloperculatipollis rudis* and *Heliosporites altmarkensis*. Other Rhaetian species are *Camerozonosporites rudis* and *Limbo-sporites lundbladii*.

Heliosporites altmarkensis and a single specimen of *Lycopodiumsporites* may indicate a Late Rhaetian or earliest Liassic influence. However, a Norian age is proposed on the basis of the well described dinoflagellate suite.

SATELLITE F-68

Depth: 2090' - 2110' Core 1

C-58206

Age: Norian

Environment: Marine

Remarks: Core 1 contains yellow-brown comminuted organic matter, carbonized wood fragments, abundant dinoflagellates and infrequent, poorly preserved spores and pollen. Tetrads of several species are present.

The dinoflagellates belong to the genera *Sverdrupiella*, *Heibergella*, *Hebecysta*, *Noricysta* and *Rhaetogonyaulax*. A Norian age is suggested by the abundant *S. mutabilis*, common *S. usitata* and other species of the same genus. The other dinocyst genera mentioned are less abundant. *Rhaetogonyaulax* is usually typical of the Rhaetian but an un-named species is recorded by Bujak & Fisher (1976) from Jameson Bay C-31, below the distinctive *Sverdrupiella* assemblage.

As well as other indeterminate tetrads, *Paracirculina quadruplicis* and *Granuloperculatipollis rudis* are also present. The former is more typical of the late Karnian whereas *G. rudis* occurs all through the Rhaetian.

Other Rhaetian forms present are *Limbosporites lundbladii* and *Ricci-sporites tuberculatus*. Very rare specimens of *Annulispora* sp., *Stereisporites cicatricosus* and *Lycopodiacidites* cf. *rugulatus* appear to represent a younger influence.

SATELLITE F-68

Depth: 3667' - 3687' Core 2

C-58206

Age: Scythian/Anisian transition

Environment: Marine

Remarks: A rich, fairly well preserved spore/pollen assemblage is associated with frequent acritarchs and a limited quantity of organic debris. Striate pollen belonging to the genera *Lunatisporites*, *Protohaploxypinus* and *Striatoabieites* is dominant. *L. novimundi/noviaulensis* which typifies the Scythian is abundant but *L. Krausei* which is found in slightly younger sediments is common. *Protohaploxypinus jacobii* and *P. spp.*, are rare. Geiger & Hopping (1968) regard *P. jacobii* as a useful marker species for the Scythian.

Other forms present which are often found in the early Triassic include *Aratrisporites spp.*, *Densoisporites playfordi*, *Equisetosporites steevesi*, *Lundbladispota spp.*, and *Nevesisporites limatulus*. The frequency of *Aratrisporites spp.*, suggests a Spathian or younger age for this core.

However, there is a younger influence represented by rare specimens of *Corisaccites sp.*, *Infernopollenites spp.* and *Striatoabieites balmei* which typify Anisian and younger sediments.

Acritarchs form approximately 40% of the total assemblage with *Micrhystridium spp.*, far more abundant than *Veryhachium spp.* Large, folded, spherical bodies are common but their significance is uncertain. They may be the result of reworking.

This sample is assigned a transitional Scythian-Anisian age.

SATELLITE F-68

Depth: 5797' - 5817' Core 3

C-58206

Age: Probably Dienerian

Environment: Slight marine influence

Remarks: Degraded spores, pollen and sparse organic debris characterize Core 3. Spores dominate the assemblage but the common retusoid forms are not stratigraphically significant. It is the less frequent taeniate pollen which indicate a Scythian age. *Lunatisporites novimundi* is common but rare specimens of *L. hexagonalis* are also present. *Protohaploxypinus jacobii* and *P. samoilovichii* are rare but both are characteristic of the Scythian.

Several other species recorded from the Scythian by Jansonius, 1962, occur in Core 3: i.e., *Aculeisporites variabilis*, *Klausipollenites decipiens*, *K. staplinii*, *K. sp.*, *Y.*, *Kraeuselisporites cf. apiculatus*, *K. spinosus*, *Proprisporites pocockii*, "*Tsugaepollenites*" *jonkeri*. *Kraeuselisporites* spp., are common but this may be because they are thick walled and have withstood the degradational processes.

Specimens of *Foveofusa* and cf. *Linotolypa* sp. indicate an early Sythian age (Staplin in press) but as no definite specimens of *Equisetosporites steevesi* are present, a Griesbachian age is discounted in favour of a Dienerian one. The rarity of *Aratrisporites* spp. supports this date.

SHERARD BAY F-14

Depth: 3900 Core 2

C-80209

Age: Rhaetian

Environment: Slight marine influence.

Remarks: Much brown and black plant debris is intermixed with poorly preserved spores and rare bisaccate pollen. The assemblage is dominated by Paleozoic reworking and *Riccisporites tuberculatus*, the latter indicating a Rhaetian age. *Camarozonosporites rudis*, *Cingulizonates rhaeticus*, *Limbo-sporites lundbladii* and *Ovalipollis ovalis* are also present and are regarded by Fisher & Bujak (1975) as being typical of the Arctic Rhaetian. Devonian reworking includes spores and megaspores from such distinctive genera as *Ancyrospora* and *Hystricosporites*. Carboniferous species are also present. The sample contains very rare microplankton. A Rhaetian age is assigned to this sample.

SUTHERLAND O-23

Depth: 2808' - 2833' Core 1

C-80207

Age: Early Liassic

Environment: Non-marine

Remarks: Very poorly preserved, degraded, and carbonized palynomorphs are associated with abundant intertinite and some carbonized plant tissue. An Early Liassic age is suggested on the basis of *Alisporites* cf. *giganteus*, cf. *Perinopollenites* sp. and several specimens of *Stereisporites cicatricosus*. One or two possible Rhaetian forms together with Norian dinoflagellates are presumed to be reworked.

SUTHERLAND O-23

Depth: 11,636 - 11,658' Core 3

C-80207

Age: Griesbachian/Dienerian

Environment: Marine

Remarks: This core contains a very poorly preserved assemblage of degraded brown and black spores, pollen and acritarchs, many of which are unrecognizable. A Scythian age is suggested by the presence of striate pollen belonging to the genera *Protohaploxypinus* and *Lunatisporites*, including *P. samoilovichii* and *L. sp.*, *V. (Jansonius)*. *Densoisporites nejburgii* and specimens resembling *Equisetosporites steevesi* are also common. Other Scythian forms, including *Aculeisporites variabilis* and *Kraeuselisporites apiculatus* are intermixed with abundant and varied acritarchs from the genera *Micrhystridium* and *Veryhachium*. Rare specimens of a very large *Veryhachium* resembling *V. ellesmerense* (Staplin in press) may indicate a Smithian influence. A Griesbachian/Dienerian age is proposed, based on the presence of common polyplicate specimens.

This assemblage has many elements in common with the non-marine Core 4 of Emerald K-33 indicating that they are of approximately similar age.

TALEMAN J-34

Depth: 6175' - 6205' Core 1

C-39239

Age: Probably early Liassic

Environment: Marine

Remarks: Core 1 contains inertinite, an abundance of large fragments of plant tissue, together with sparse spores, pollen and dinoflagellates. The spores include many simple laevigate, apiculate and granulate forms and the rare pollen grains are not stratigraphically useful. The occasional dinoflagellate offers the only indication as to the age. Possible representatives of *Nannoceratopsis*, *Mancodinium* and *Rhombodella* are present. *Rhombodella* is found in the Rhaetian of Austria whereas the other two genera are Jurassic. A distinctive undescribed microfossil only seen elsewhere in May Point Core 1 is present, perhaps suggesting a comparable age. A tentative early Liassic age is therefore postulated.

TALEMAN J-34

Depth: 9817' - 9877' Core 2

C-39239

Age: Late Scythian or earliest Anisian

Environment: Non marine.

Remarks: Core 2 contains inertinite, large and small fragments of plant material, some sapropel and frequent spores and pollen which are moderately well preserved.

This non-marine assemblage is dominated by taeniate pollen (i.e., 90% of spore/pollen assemblage) belonging to the genera *Lunatisporites*, *Proto-*

haploxypinus, *Infernopollenites* and *Striatoabieites*. Spores represented include *Aratrisporites*, *Densoisporites*, *Krauselisporites* and *Nevesisporites*, all of which occur in the Scythian.

Several species of *Lunatisporites* are present but *L. noviaulensis*/*L. novimundi* dominates suggesting a Scythian or possibly early Middle Triassic age. *L. acutus*, *L. krauseli* and *L. transversundatus* as a group are common, the first two occurring in the Anisian and younger (Scheuring 1970). The presence of rare *Striatoabieites aytugii*, *S. cf. balmei* and *Infernopollenites* spp., indicates an Anisian influence although the bulk of the assemblage is more Scythian in character. As *Striatoabieites* is not abundant, as it often is in Anisian samples, a latest Scythian or earliest Anisian age is suggested.

W. HECLA P-62

Depth: 3390' - 3450' Core 1 and 2

C-80211

Age: Anisian

Environment: Slight marine influence

Remarks: Abundant oily residue is mixed with orange-brown spores and pollen in this sample. The latter are mostly poorly preserved *Triadispora* spp. and taeniate pollen belonging to the genera *Lunatisporites* and *Striatoabieites* dominate and together indicate a Middle Triassic age. *Triadispora* is represented by at least 3 species of which *T. cf. aurea* is the most abundant although *T. modesta* and *T. obscura* are present. This genus ranges through the Anisian to the Karnian (Scheuring 1970). Vissler, 1966, also records several species from the U. Bunter of the Netherlands where

it predominates over *Lunatisporites multiplex* and *Striatoabieites aytugii*. The W. Hecla assemblage contains rare *S. aytugii* and common specimens of the smaller *S. balmei*. The latter is a marker species used by Geiger & Hopping (1968) as typical of the L. and M. Muschelkalk (i.e. Anisian).

Lunatisporites is represented by *L. acutus*, *L. noviaulensis*, rare *L. novimundi* and *L. pellucidus*. These support an Anisian age although *L. acutus* and *L. pellucidus* extend into the Upper Triassic.

The large bisaccate *Illinites kosankei* is typical of the L. Muschelkalk and cf. *Corisaccites*, cf. *Rimaesporites*, *Contignisporites problematicus* and *Verrucosisporites morulae* are further elements indicating an Anisian age or younger. Rare specimens of cf. *Pseudoenzonalasporites* sp. and cf. *Camerosporites* may indicate a younger influence. However, the bulk of the assemblage is Anisian in character.

WILKINS E-60

Depth: 3432' - 3462' Core 2

C-30221

Age: Late Ladinian

Environment: Marine

Remarks: Core 2 contains very thin, yellow spores, pollen and abundant acritarchs chiefly belonging to the genus *Micrhystridium*. Inertinite is also fairly common. The dominance of *Striatoabieites aytugii* indicates an Anisian/Ladinian age. Less common are forms with reduced sacci (i.e. *Granosaccus ornatus*, *Protodiploxypinus* cf. *gracilis*, and *P.* cf. *decus*) together with *Lunatisporites* cf. *Krauseli*, *Ovalipollis lunnensis*, *O. ovalis*,

Triadispora sp., and *Camerosporites* sp.. *Granosaccus ornatus* and *Camerosporites* sp. suggest a slight Karnian influence and the genus *Ovalipollis* is thought to have its lowest occurrence in the Ladinian of the Arctic. A Late Ladinian age is therefore assigned to this sample.

A P P E N D I X I

Species Lists for Each Sample

A. Field Samples

B. Core Samples

(in alphabetical order)

KEY TO FREQUENCY

(A)	...	Abundant	20+	specimens	recorded	from	1	slide
(C)	...	Common	6 - 20	"	"	"	"	"
(R)	...	Rare	2 - 5	"	"	"	"	"
(VR)	...	Very Rare	1	"	"	"	"	"

A. FIELD SAMPLES

BORDEN ISLAND, N. W. T.

Field No.

77-BAA-024

GSC Loc. No.

C-75984

Spores and Pollen:

Alisporites grandis (R)
A. robustus and *A. radialis* (R)
A. spp. (A)
Aratrisporites sp. (R)
Cadargasporites granulatus (VR)
Callialasporites turbatus (R)
Camazonosporites sp. (R)
Cerebropollenites sp. (VR)
Chordasporites platysaccus (VR)
C. sp. (R)

Lycopodiumsporites austroclavatidites (C)
L. semimuris and *L. sp.* (C)
Perinopollenites elatoides (R)
Pinuspollenites minimus (R)
P. spp. (R)
Quadraeculina anellaeformis (VR)
Schismatosporites ovalis (VR)
Schizocystia cf. rara (VR)
Stereisporites cicatricosus and *S. sp.* (R)

Reworking:

Devonian spores (R)

Plankton:

Micrhystridium sp. (R)
Pareodinia sp. (VR)

Age:

Sinemurian

BORDEN ISLAND, N. W. T.

Field No.

GSC Loc. No.

77-BAA-026A

Spores and Pollen:

C-75986

Alisporites (R)
Camarozonosporites sp. (VR)
Corollina sp. (VR)
Classopollis sp. (VR)
Dictyophyllidites mortoni (R)
Granulatisporites sp. (R)
Lycopodiumsporites austroclavatidites (VR)
L. semimuris (VR)
Podocarpidites sp. (VR)
Sulcatisporites sp. (VR)
Vitreisporites pallidus (R)

Plankton:

?*dinoflagellates* (R)
Micrhystridium sp. (R)

Age: Early Jurassic, undifferentiated.

YELVERTON LAKE

75-WR-10

C-55364

7

Spores and Pollen:

Alisporites spp. (C)
cf. *Classopollis* sp. (R)
Contignisporites problematicus (C)
Dictyophyllidites mortoni (R)
Lycopodiumsporites sp. (R)
Protohaploxylinus sp. (VR)
Verrucosisporites sp. (R)

Plankton:

Micrhystridium sp. (R)

Age: Early Jurassic, undifferentiated.

YELVERTON LAKE

Field No.

GSC Loc. No.

75-WR-10
8

Spores and Pollen:

C-55365

Alisporites sp. (R)
Apiculatisporis sp. (R)
Cerebropollenites mesozoicus (R)
Lycopodiumsporites australoclavatidites (R)
L. spp. (R)
Stereisporites cf. *cicatricosus* (VR)

Verrucosisporites spp. (C)

Plankton:

? Dinoflagellate indet. (VR)
Micrhystridium sp. (VR)

Age: Probably Early Jurassic

75-WR-10
10

Spores and Pollen:

C-55367

Alisporites sp. (R)
Apiculatisporis sp. (R)
Lycopodiumsporites spp. (C)
Stereisporites cicatricosus (VR)
Verrucosisporites sp. (R)

Plankton:

Micrhystridium sp. (R)

Age: Probably Early Jurassic.

75-WR-11
1

Spores and Pollen:

C-55369

Alisporites grandis (R)
Bisaccates indet. (A)
Spores indet. (A)

Plankton:

Gonyaulacysta spp. (C)
Pareodinia capillosa (A)
P. cf. *borealis* (R)
P. spp. (C)
Psaligonyaulax dualis (R)

Age: Late Oxfordian/early Kimmeridgian.

Field No.

Yelverton Lake

GSC Loc. No.

C-55370

75-WR-11

2

Spores and Pollen:

Alisporites spp. (A)

Cylogranisporites sp. (VR)

Lycopodiumsporites sp. (R)

Pollen and spores indet. (A)

Plankton:

Gonyaulacysta spp. (A)

Pareodinia capillosa (R)

Age: Late Oxfordian/early Kimmeridgian.

B. CORE SAMPLES

Amund Central Dome H-40

Depth

5169' - 5190'

Core No. 1

C-46845

Spores and pollen:

Brachysaccus sp. (R)

Camazonosporites cf. *rudis* (VR)

Corollina sp. (R)

Cycadopites acerrimus (R)

Granosaccus ornatus (R)

Limbosporites lundbladii (R)

Lunatisporites rhaeticus (R)

Ovalipollis ovalis (VR)

Riccisporites tuberculatus (C)

Vitreisporites pallidus (R)

Zebrasporites laevigatus (VR)

Plankton:

Filisphaeridium sp. (C)

Sverdrupiella spp. (A) including

S. downiei, *S. mutabilis*, *S. septentrionalis*, *S. usitata*

Age: Norian

Amund Central Dome H-40

Depth

9060' - 9121'
Core 2 and 3

GSC Loc. No.

C-46845

Spores and Pollen:

- Aratrisporites* cf. *fischeri* (R)
- cf. *Corollina* sp. (R)
- Falcisporites stabilis* (R)
- Infermopollenites* sp. (VR)
- Lunatisporites* cf. *acutus* (VR)
- L.* cf. *noviaulensis* (R)
- L.* sp. indet. (R)
- Nevesisporites limatulus* (VR)
- Protohaploxylinus* sp. (VR)
- Vitreisporites pallidus* (VR)

Plankton:

- Micrhystridium* sp. (R)
- Sverdrupiella* sp. (R)

Age: Late Scythian/early Anisian.

CAPE NOREM A-80

Core 1 and 35 cuttings samples are included here.

4990' Cuttings

Spores and Pollen:

C-30200

- Brachysaccus* sp. (VR)
- Corollina meyeriana* (R)
- Duplicisporites* sp. (VR)
- Granosaccus* sp. (R)
- Ovalipollis brevipennis* (VR)
- Paracirculina scurrilis* (R)
- cf. *Paracirculina* sp. (R)
- cf. *Riccisporites* sp. (R)
- cf. *Vallasporites* sp. (VR)
- Vitreisporites pallidus* (R)
- ?*Zebrasporites* sp. (VR)

Plankton:

- Micrhystridium* sp. (R)

Reworking:

- Palaeozoic spores (R)

Caving:

C-30200

Jurassic pollen, spores and dinoflagellates (A). Pollen includes large bisaccates e.g. *Alisporites giganteus*. Spores include *Lycopodiumsporites*, and *Stereisporites*. Dinoflagellate genera present are *Mancodinium*, *Pareodinia* and others.

Age: Upper Triassic, Rhaetian.

5090' Cuttings

C-30200

Spores and Pollen:

Alisporites spp. (R)
Corollina meyeriana (VR)
cf. *Limbosporites* sp. (VR)
Paracirculina scurrilis (R)
P. sp. (R)

Plankton:

Micrhystridium sp. (R)

Caving:

Jurassic spores, pollen and dinoflagellates (A)

Age: Upper Triassic, Rhaetian.

5200' Cuttings

C-30200

Spores and Pollen:

Alisporites spp. (R)
Brachysaccus sp. (VR)
Corollina meyeriana (R)
Duplicisporites sp. (VR)
Limbosporites lundbladii (R)
Ovalipollis sp. (VR)
Paracirculina scurrilis (VR)
Protodiploxypinus sp. (VR)
? *Riccisporites* sp. (VR)

Plankton:

Micrhystridium sp. (R)

Reworking:

Palaeozoic pollen (VR)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
Dinoflagellates are common and include the genera *Gonyaulacysta*, *Mancodinium*, *Nannoceratopsis* and *Pareodinia*.

Age: Rhaetian.

Cape Norem A-80

5300' Cuttings

GSC Loc. No.

C-30200

Spores and Pollen

Alisporites spp. (R)
Camerozonosporites rudis (VR)
Cingulizonates rhaeticus (R)
Falcisporites stabilis (VR)
Lunatisporites rhaeticus (R)
Ovalipollis ovalis (VR)
Paracirculina scurrilis (VR)
Protohaploxypinus sp. (VR)
Riccisporites sp. (VR)
Semiretispora gothae (R)

Plankton:

Sverdrupiella usitata (R)
Sverdrupiella spp. (R)

Reworking:

Upper Devonian/Carboniferous spores (R)

Caving:

Cretaceous spores (R)
Jurassic spores, pollen and
dinoflagellates (A)
Species are similar to sample above

Other fossils:

Scolecodont (VR)

Age: Norian

5390' cuttings

Spores and pollen:

Alisporites sp. (R)
Cingulizonates rhaeticus (VR)
Lunatisporites sp. (VR)
Platysaccus sp. (VR)
Vitreisporites pallidus (VR)

Plankton:

Sverdrupiella usitata (R)
S. sp. (VR)

Reworking:

Carboniferous spores (R)

5390' cuttings

GSC Loc. No.
C-30200

Caving:

Jurassic spores, pollen and
dinoflagellates (A)
Species similar to those in
higher samples

Age: Norian

5505-40' Core 1

Spores and pollen:

Brachysaccus sp. (R)

cf. *Patinasporites* sp. (VR)

Riccisporites sp. (A)

Tetrads indet. (C)

Triadispora sp. (R)

Plankton:

Hebecysta sp. (R)

Micrhystridium sp. (R)

Noricysta pannucea (R)

N. varivallata (R)

N. spp. (R)

Sverdrupiella usitata (C)

Sverdrupiella spp. (C) -

including *S. downiei*, *S. mutabilis*

S. sabinensis and *S. spinosa*

Other fossils:

Scolecodont (VR)

Age: Norian

5590' Cuttings

Spores and pollen:

Annulispora folliculosa (VR)

Contignisporites gyratus (VR)

Corollina meyeriana (R)

Discisporites niger (R)

Paracirculina tenebrosa (VR)

Platysaccus sp. (VR)

Sulcatisporites sp. (VR)

? *Triadispora obscura* (VR)

Plankton:

Sverdrupiella multabilis and *S. spp.* (R)

5590' Cuttings

Cavings:

Jurassic spores, pollen and
dinoflagellates (A)
Genera as mentioned before

Age: Probably Norian.

5720' Cuttings

Spores and pollen:

Alisporites spp. (R)
Aratrisporites sp. (VR)
Lunatisporites rhaeticus (VR)
Paracirculina sp. (VR)
Parcisporites annectus (VR)
Triadispora sp. (VR)
Verrucosisporites cf. morulae (VR)

Plankton:

None

Reworking:

Palaeozoic spores (R)

Caving:

Jurassic spores, pollen and
dinoflagellates (A)
Genera as in higher samples

Age: Indet.

5790' Cuttings

Spores and pollen:

Alisporites sp. (R)
Densoisporites sp. (VR)
? *Duplicisporites* sp. (VR)
Falcisporites stabilis (R)
Parcisporites cf. annectus (VR)

Plankton:

Sverdrupiella usitata (R)

Reworking:

Palaeozoic spores (VR)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
Species as in previous samples
Rhaetian spores (VR)

Age: Indet.

5900' Cuttings

Spores and pollen:

Alisporites sp. (VR)
Contignisporites gyratus (VR)
Densoisporites sp. (VR)
? *Paracirculina* sp. (VR)
Samaropollenites speciosus (VR)
Sulcatisporites sp. (VR)
Verrucosisporites cf. *morulae* (VR)
Vitreisporites pallidus (VR)

Plankton:

Micrhystridium (VR)
Veryhachium ?riburgensis (VR)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
Species as before

Age: Indet.

6010' Cuttings

Spores and pollen:

Alisporites sp. (R)
Contignisporites problematicus (VR)
Corollina meyeriana (R)
cf. *Duplicisporites* sp. (VR)
cf. *Granosaccus* sp. (VR)
Lunatisporites rhaeticus (VR)
Patinasporites densus (VR)
cf. *Rimaesporites* sp. (VR)
Samaropollenites cf. *speciosus* (R)

Plankton:

Micrhystridium sp. (R)
Sverdrupiella spp. (R)

Reworking:

Palaeozoic spores (R)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
Genera as in higher samples
Rhaetian spores (R)

Age: Indet.

6110' Cuttings

Spores and pollen:

Alisporites sp. (R)
Corollina meyeriana (C)
Lunatisporites sp. (VR)
Lundbladispota sp. (VR)
Samaropollenites cf. *speciosus* (R)
Sulcatisporites sp. (VR)

Plankton:

Micrhystridium sp. (R)
Sverdrupiella spp. (R)

Reworking:

Palaeozoic spores (R)

Caving:

Jurassic spores, pollen and flagellates (C)

Age: Indet.

6190' Cuttings

Spores and pollen:

Alisporites sp. (R)
Corollina meyeriana (R)
Densoisporites sp. (R)
Falcisporites stabilis (R)
Lunatisporites noviaulensis (R)
L. sp. (VR)
Platysaccus sp. (VR)

Plankton:

Micrhystridium sp. (R)
Sverdrupiella usitata (R)
Veryhachium valensii (R)

Caving:

Jurassic spores pollen and dinoflagellates (C)
Rhaetian spores (R)

Age: Indet.

6290' Cuttings

Spores and pollen:

Alisporites (R)
Lunatisporites sp. (VR)

Corollina meyeriana (R)
Riccisporites sp. (VR)
?Samaropollenites sp. (VR)

Plankton:

Veryhachium valensii (VR)

Caving:

Cretaceous spores (R)
Jurassic spores, pollen and dino-
flagellates (A)
Cerebropollenites mesozoicus is abundant

Age: Indet.

6400' cuttings

Spores and pollen:

Lunatisporites sp. (VR)
Protohaploxypinus sp. (VR)

Plankton:

Heibergella sp. (VR)
Sverdrupiella usitata (VR)
Veryhachium valensii (VR)

Caving:

Jurassic spores pollen and dinoflagellates (C)

Age: Indet.

6490' Cuttings

Spores and pollen:

cf. *Annulispora* sp. (VR)
Riccisporites tuberculatus (R)
Taeniaesporites noviaulensis (VR)
Tetrads indet. (R)

Plankton:

Sverdrupiella sp. (R)
Veryhachium valensii (VR)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
The dinoflagellate *Mancodinium* is abundant.

Age: Indet.

6620' Cuttings

GSC Loc. No.
C-30200

Spores and pollen:
Nothing definitely in situ except
perhaps *Vitreisporites pallidus*.

Caving:
Jurassic spores, pollen and dino-
flagellates (C)

Age: Indet.

6720' Cuttings

Spores and pollen:
Some corroded, pyretized, indeterminate
bodies present which are presumed
in situ.

Caving:
Jurassic spores, pollen, acritarchs and
dinoflagellates (C)

Age: Indet.

6810' Cuttings

Spores and pollen:
? *Camerosporites* sp. (R)
Granosaccus ornatus (VR)
? *Infernopollenites* sp. (VR)
Lunatisporites noviaulensis (VR)
L. sp. (VR)
? *Ovalipollis ovalis* (VR)

Plankton:
Micrhystridium sp. (R)
Sverdrupiella mutabilis (R)
S. spp. (R)
Veryhachium valensii (R)

Caving:
Jurassic spores, pollen and dinoflagellates (C)

Age: Indet.

6900' Cuttings

GSC Loc. No.
C-30200

No insitu spores and pollen.
Jurassic caving consists of *Carnisporites mesozoicus*, some bisaccate pollen and rare dinoflagellates including the genus *Mancodinium*.

Age: Indet.

7010' Cuttings

A few corroded, pyretized spores present
Very little Jurassic caving.

Age: Indet.

7070' Cuttings

Few corroded, pyretized spores
Very little Jurassic caving

Age: Indet.

7180' Cuttings

Spores and pollen:
Lunatisporites sp. (VR)

Plankton:
Sverdrupiella mutabilis and *S.* sp. (R)

Caving:
Jurassic spores, bisaccates, acritarchs
and dinoflagellates (A)

Age: Indet.

7340' Cuttings

Spores and pollen:
Alisporites sp. (R)
Discisporites cf. *niger* (R)
Fossapollenites moderatus (VR)
Lunatisporites noviaulensis (VR)
L. sp. (R)
cf. *Paracirculina* sp. (VR)
Protodiploxypinus minutus (VR)
P. sp. (VR)

Plankton:
Sverdrupiella usitata and *S.* sp. (R)

Caving:
Jurassic spores, pollen and dino-
flagellates (A)
Rhaetian spores (R)

Other Fossils:
Tasmanites sp. (R)

Age: Indet.

7510' Cuttings

Spores and Pollen:
Camerosporites cf. *pseudoverrucatus* (VR)
Kraeuselisporites sp. (VR)
Lunatisporites sp. (VR)
Protohaploxypinus sp. (VR)
?Paracirculina sp. (VR)

Caving:
Jurassic spores, pollen and dino-
flagellates (C)

Age: Indet.

7670' Cuttings

Spores and pollen:
Carnisporites mesozoicus (VR)
Fossapollenites sp. (VR)
Lunatisporites noviaulensis (VR)

Plankton:
Micrhystridium sp. (VR)

Caving:
Jurassic (as in higher samples).

Reworking:
Upper Devonian spore (VR)

Age: Indet.

7740' Cuttings

Rare indeterminate carbonized and corroded spores and the acritarch genus *Micrhystridium* is present. Jurassic caving occurs but is not as abundant as in previous samples.

Age: Indet.

Caving:
Jurassic spores, pollen and dino-
flagellates (A)
Rhaetian spores (R)
Norian dinoflagellates (R)

Age: Indet.

8190' Cuttings

Spores and pollen:
? *Aratrisporites* sp. (VR)
? *Kraeuselisporites* sp. (VR)
Sulcatisporites cf. *krauseli* (VR)

Plankton:
Micrhystridium sp. (R)

Reworking:
Carboniferous spore (VR)

Caving:
Jurassic spores, pollen and dino-
flagellates (A)
Norian dinoflagellates (R)

Age: Indet.

8310' Cuttings

Spores and pollen:
Contignisporites gyratus (VR)
cf. *Enzonalsporites* sp. (VR)
Protodiploxypinus sp. (VR)

Plankton:
Micrhystridium (R)

Caving:
Jurassic spores, pollen and dino-
flagellates (A)
Norian dinoflagellates (R)

Age: Indet.

8490' Cuttings

Spores and pollen:

Very few and poorly preserved. No stratigraphically significant forms present.

Plankton:

cf. *Foveofusa* sp. (VR)
Micrhystridium sp. (R)
Veryhachium valensii (VR)

Caving:

Spores, pollen and dinoflagellates (A)
Rhaetian spores (R)
Norian dinoflagellates (R)

Age: Indet.

8610' Cuttings

Spores and pollen:

Few poorly preserved in situ spores present but nothing stratigraphically useful.

Plankton:

Micrhystridium sp. (R)

Caving:

Jurassic spores, pollen and dinoflagellates (A)
Norian dinoflagellates (R)

Age: Indet.

8730' Cuttings

Spores and pollen:

cf. *Aculeisporites* sp. (VR)
Alisporites sp. (VR)
Apiculatisporites sp. (VR)
Klausipollenites sp. (VR)
?Kraeuselisporites sp. (VR)
Lunatisporites hexagonalis (R)
L. novimundi (C)
L. spp. (R)
Striatipodocarpites sp., cf. *S. duivenii* (VR)
S. sp., cf. *S. richteri* (VR)

Plankton:

Micrhystridium spp. (R)

Caving: Jurassic spores, pollen and dino-
flagellates (C)
Norian dinoflagellates

Age: Scythian

8790' Cuttings

Spores and pollen:
Aculeisporites variabilis (VR)
Cycadopites follicularis (R)
"Dulhuntyispora" *minuta* (R)
Kraeuselisporites sp. (VR)
Lunatisporites albertae (VR)
L. hexagonalis (VR)
L. novimundi (C)
Neveisporites limatulus (R)
Protohaploxypinus sp. (R)

Plankton:
Micrhystridium spp. (C)

Caving: Cretaceous spores (R)
Jurassic spores pollen and dino-
flagellates (C)

Age: Scythian. ? Smithian

DEPOT POINT L-24

8776 - 8806'
Core 1

C-38246

Spores and pollen:
cf. *Aculeisporites variabilis* (VR)
? *Aratrisporites* sp. (VR)
Apiculatisporis sp. (R)
Cycadopites sp. (R)
? *Densoisporites* sp. (VR)
Equisetosporites cf. *steevesi* (VR)
Klausipollenites sp. (VR)
Kraeuselisporites sp. (C)
Lunatisporites hexagonalis (R)
L. novimundi (A)
Protohaploxypinus sp. (VR)

Plankton:
Micrhystridium sp. (A)
Veryhachium sp. (VR)

Age: Scythian - undifferentiated.

DOME BAY P-36

GSC Loc. No.

7053 - 7073'

C-46847

Core 1

Spores and pollen:

Alisporites spp. (C)
A. cf. grandis (VR)
Annulispora sp. (VR)
Aratrisporites sp. (VR)
Corollina sp. (VR)
Dictyophyllidites mortoni (VR)
Granulatisporites sp. (R)
Lycopodiumsporites spp. (R)
cf. Ovalipollis sp. (VR)
cf. Protodiploxypinus sp. (VR)

Plankton:

Dinoflagellate indet. (VR)

Age: Liassic.

DOME BAY P-36

8020 - 8040'

C-46847

Core No. 2

Spores and pollen:

cf. Camarozonosporites sp. (R)
Cingulizonates sp. (VR)
Corollina meyeriana (C)
Lycopodiumsporites ? austroclavatidites (VR)
L. sp. (R)
Polycingulatisporites sp. (R)
Riccisporites cf. tuberculatus (R)
Stereisporites sp. (VR)

Triancoraesporites reticulatus (R)
Vitreisporites pallidus (R)

Plankton:

Leiofusa jurassica (VR)
Micrhystridium sp. (VR)
Suessia cf. swabiana (VR)

Reworking:

Norian dinoflagellates (R)
including *cf. Hebecysta* sp. and
Sverdrupiella sp.

Age: Latest Rhaetian/earliest Hettangian

DRAKE F-16

3720 - 3780'

Core 5

GSC Loc. No.
C-67700

Spores and pollen:

Alisporites sp. (C)
Annulispora folliculosa (VR)
Aratrisporites sp. (R)
Contignisporites sp. (R)
Granosaccus ornatus (R)
Heliosporites altmarkensis (VR)
Iraquispora laevigata (VR)
I. speciosa (R)
Limbosporites lundbladii (C)
Lunatisporites rhaeticus (VR)

Lycopodiumsporites cf. *austroclavatidites* (VR)
Ovalipollis breviformis (R)
Paracirculina scurrilis (R)
Parcisporites annectus (R)
Quadraeculina anellaeformis (R)
Riccisporites tuberculatus (R)
Sterisporites cf. *performatus* and *S. sp.* (R)
Triancoraesporites ancorae (VR)

Plankton:

Heibergella aculeata, *H. asymmetrica* + *H. spp.* (C)
Sverdrupiella mutabilis (A)
S. sabinensis, *S. spinosa*, *S. usitata*, *S. spp.* (C)

Age: Norian

DRAKE POINT L-16

4737 - 4796'

Core 2

C-30239

Spores and pollen:

Alisporites spp. (C)
Annulispora sp. (VR)
Chordasporites singulichorda (VR)
Corisaccites sp. (R)
Densoisporites spp. (R)
Infermopollenites parvus (R)
I. spp. (R)
Klausipollenites cf. *staplirii* (R)
Lunatisporites acutus (R)
L. multiplex and *L. sp.* (R)
Podosporites cf. *amicus* (VR)
Protodiploxypinus gracilis (A)
P. spp. (R)
Striatoabietites aytugii (A)
Triadispora obscura (R)
T. stabilis (C)
T. spp. (C)
Verrucosporites cf. *morulae* (R)

Plankton:
None

GSC Loc. No.
C-30239

Reworking:
Devonian/Carboniferous spores (R)

Age: Anisian.

EAST AMUND M-05

5840 - 5861'

C-80210

Core 1 . Spores and pollen:
Alisporites sp. (R)
?Aratrisporites sp. (VR)
Apiculate spores (R)
Bisaccates indet. (C)
Limbosporites cf. *lundbladii* (VR)
Vitreisporites pallidus (R)

Plankton:
?Dinoflagellate (VR)

Age: Rhaetian or earliest Liassic

EAST AMUND M-05

7362 - 7392'

C-80210

Core 2 Spores and pollen:
Carbonized palynomorphs (R)

Plankton:
Micrhystridium sp. (R)

Age: Indeterminate.

EMERALD K-33

GSC Loc. No.
C-30844

5420 - 5458'

Core 3

Spores and pollen:

Aratrisporites sp. (R)
Camerozonosporites sp. (R)
Chordasporites singulichorda (VR)
Infernopollenites parvus (R)
I. sp. (R)
Lunatisporites cf. *krauseli* (VR)
Nevesisporites limatulus (C)
cf. *Polycingulatisporites* sp. (R)
Protodiploxypinus cf. *gracilis* (C)
Striatoabietites aytugii (A)
Striatoabietites spp. (C)

Plankton:

None

Reworking:

Devonian spores (R)
? Permian pollen (VR)

Incertae sedis:

Vescicles (R) ? Reworked

Age: Anisian.

7140 - 7160'

Core 4

Spores and pollen:

Aculeisporites variabilis (VR)
Apiculatisporis sp. (R)
Aratrisporites strigosus (C)
Cycadopites follicularis (R)
Densosporites nejbungii (C)
Equisetosporites steevesi (R)
E. sp. (C)
Krauselisporites sp. (VR)
Lundbladispota sp. (VR)
Lunatisporites novimundi (C)
L. pellucidus (R)
L. sp. V (Gansoni 1962) (VR)
Protohaploxylinus jacobii (R)
P. samoilowichii (A)
P. spp. (R)
Striatoabietites sp., cf. *richteri* (R)

Plankton:
None

GSC Loc. No.
C-30844

Incertae Sedis:
cf. *Linotolypa* sp. (R)
Vesicle (VR)

Reworking:
Permian pollen - mostly *Protohaploxyrinus* spp.,
also *Striatopodocarpites* sp. (C)

Age: mid-Scythian

GRAHAM C-52

5252 - 5282' (Grey shale)
Core 3 Spores and pollen:

C-46846

Alisporites grandis (R)
Annulispora cf. *folliculosa* (R)
Aratisporites spp. (C)
Bisaccates (C)
Camarozonosporites sp. (VR)
Corollina sp. (R)
Cingulizonates rhaeticus (C)
Granosaccus ornatus (R)
Iraquispora laevigata (R)
I. speciosa (R)
Limbosporites lundbladii (C)
Lunatisporites rhaeticus (R)
Lycopodiacidites sp. (VR)
Lycopodiumsporites semimuris (VR)
Ovalipollis sp. (R)
Platysaccus sp. (R)
Semiretispora gothae (R)
Stereisporites sp. (VR)
Vitreisporites pallidus (R)
Zebrasporites interscriptus (R)
Z. laevigatus (R)

Plankton:
Cleistosphaeridium sp. (VR)
cf. *Dapcodinium* sp. (R)
Dinoflagellates gen. nov. (C)
Leiofusa jurassica (R)
Micrhystridium sp. (R)
cf. *Rhaetogonyaulax* sp. (VR)

Reworking:
Permian pollen (VR)

Age: Latest Rhaetian or earliest Hettangian.

GRAHAM C-52

5252 - 5282' (from mottled siltstone)
Core 3 Spores and pollen:
Sporomorphs (C)

GSC Loc. No.
C-46846

Plankton:
Micrhystridium sp. (R)

Age: Indeterminate.

ISACHSEN J-37

3344 - 3372'
Core 1

C-67946

Spores and Pollen:
cf. Camerosporites sp. (R)
Camerosporites pseudoverrucatus (VR)
Dictyophyllidites mortoni (R)
Granosaccus ornatis (R)
Infernopollenites sp. (R)
Lunatisporites acutus (VR)
L. noviaulensis (R)
L. pellucidus (VR)
Ovalipollis ovalis (R)
Polycingulatisporites sp. (R)
Protodiploxypinus cf. gracilis (C)
P. sp. (R)
Protohaploxypinus sp. (R)
cf. Rimaesporites sp. (VR)
Vitreisporites pallidus (R)

Plankton:
Micrhystridium spp. (C)
including *M. brevispinosum*, *M. castaninum*,
M. gregarium
Veryhachium spp. (C)
including *V. valensii*, *V. ?riburgense*

Other Fossils:
Tasmanitid - *Dictyotidium* sp. (R)

Age: Early Karnian

ISACHSEN J-37

5437 - 5457'
Core 2

GSC Loc. No.

C-67946

Spores and pollen:

cf. *Accinctisporites* sp. (VR)
Aratrisporites fischeri (R)
A. tenuispinosus (R)
Chordasporites singulichorda (VR)
Densoisporites nejburgii (R)
cf. *Equisetosporites* sp. (R)
cf. *Foveotriletes* sp. (C)

Krauselisporites apiculatus (VR)
Lueckisporites cf. *triassicus* (VR)
Lunatisporites cf. *acutus* (R)
L. multiplex (VR)
L. noviaulensis (R)
L. pellucidus (R)
L. cf. *transversundatus* (C)
L. spp. (R)
Lundbladispota spp. (R)
Protohaploxylinus samoilovichii (R)
P. sp. (Scheuring) (R)
Polypodiumsporites sp. (R)
?Triadispota spp. (R)
Uvaesporites sp. (VR)
cf. *Vestigisporites* sp. (VR)

Plankton:

Micrhystridium spp. (A)
including *M. castaninum*, *M. gregarium*,
M. jekhowskyi

Reworking:

Palaeozoic spores and pollen (R)

Age: Late Spathian.

KING CHRISTIAN N-06

6643 - 6696'
Core 2

C-39376

Spores and pollen:

Alisporites sp. (R)
Acanthotriletes sp. (VR)
Aratrisporites cf. *A. paenulatus* (VR)

6643 - 6696'
Core 2

GSC Loc. No.
C-39376

Spores and pollen:

Klausipollenites sp. (VR)
Lunatisporites cf. *noviaulensis* (R)
L. cf. *pellucidus* (R)
Vitreisporites pallidus (R)

Plankton:

Micrhystridium sp. (R)
Spiny indet. bodies (R)

?Reworking:

Large spores (R)

Age: Probably late Scythian or early Anisian

9566 - 9595'
Core 3

C-39376

Spores and pollen:

Aratisporites sp. (R)
Cycadopites follicularis (R)
Densoisporites ? nejburgii (R)
cf. "*Dulhuñtyspora*" sp. (R)
Klausipollenites sp. Y (Jansonius 1962) (VR)
K. sp. (VR)
Lunatisporites hexagonalis (R)
L. cf. *pellucidus* (R)
L. novimundi/noviaulensis (C)
L. spp. (R)
Polycingulatisporites sp. (VR)
Striatoabietes cf. *balmei* (VR)
S. cf. *aytugii* (VR)

Plankton:

Leiofusa jurassica (C)
Micrhystridium jekhowskyi (A)
M. spp. (A)
Veryhachium riburgense (C)
V. valensii (R)

Age: Late Scythian

KING CHRISTIAN N-06

GSC Loc. No.
C-39376

10,989 - 11,020'
Core 4

Spores and pollen:

Aratrisporites tenuispinosus (R)
Cycadopites cf. *folliculosa* (C)
Densoisporites cf. *D. nejburgii* (R)
Equesetosporites steevesi (VR)
Klausipollenites sp. (VR)
Lunatisporites cf. *L. albertae* (R)
L. ? hexagonalis (R)
L. novimundi (R)
L. sp. U (Jansonius) (VR)
L. spp. indet. (C)

Plankton:

Leiofusa jurassica (R)
Micrhystridium spp. (A)
Veryhachium valensii (R)
V. ? riburgense (R)

Age: Scythian, possibly Smithian

KRISTOFFER BAY B-06

9446 - 9470'
Core 3

C-48846

Spores and pollen:

Alisporites sp. (R)
Apiculatisporites spp. (C)
Contignisporites problematicus (VR)
cf. *Granosaccus* sp. (R)
Limboisporites cf. *lundbladii* (VR)
Lunatisporites rhaeticus (VR)
Ovalipollis sp. (R)
Riccisporites cf. *tuberculatus* (VR)
Vitreisporites pallidus (R)

Plankton:

Dinoflagellates indet. (R)
Hebecysta sp. (R)
Micrhystridium sp. (R)
Noricysta sp. (VR)
cf. *Sverdrupiella* sp. (R)

Age: Norian

LOUISE O-25

7464 - 7483'
Core 2

GSC Loc. No.
C-64330

This sample contains totally carbonized material although some indeterminate sporomorphs are present.

Age: Indeterminate.

MAY POINT H-02

8748 - 8773'
Core 1

C-51809

Spores and pollen:

Alisporites spp. (R)
Apiculatisporis sp. (A)
Chordasporites singulichorda (VR)
Dictyophyllidites mortoni (R)
cf. *Exesipollenites* sp. (VR)
Granulatisporis sp. (C)
Laevigate spores (R)
Lycopodiumsporites (sp. (VR)
Osmundacidites sp. (C)
Vitreisporites pallidus (R)

Plankton:

Dinoflagellates indet. (VR)
cf. *Nannoceratopsis* sp. (C)

Incertae sedis:

Microfossil sp. X. (as in Taleman Core 1) (VR)

Age: Early Liassic

9500 - 9520'
Core 2

C-51809

Spores and Pollen:

Annulispora sp. (VR)
Aratrisporites sp. (VR)
Camazonosporites rudis (VR)
Cingulizonates rhaeticus (R)
Corollina sp. (R)
Granosaccus ornatus (VR)
Limbosporites lundbladii (VR)
Lunatisporites rhaeticus (VR)
Lycopodiumsporites sp. (VR)
Riccisporites tuberculatus and
R. sp. (A)

9500 - 9520'

GSC Loc. No.
C-51809

Semiretisporis cf. *gothae* (VR)
S. maljavkinae (R)
Triancoraesporites ancorae (VR)
Zebrasporites interscriptus (R)

Plankton:

Dinoflagellates indet. (R)
? *Nannoceratopsis* sp. (R)
Rhaetogonyaulax sp. (R)

Age: Latest Rhaetian or earliest Hettangian.

MID FIORD J-53

6475 - 6515'
Core 1

C-48832

Spores and pollen:

Alisporites grandis (R)
Annulispora cf. *folliculosa* (R)
Aratrisporites sp. (R)
Apiculatisporis spp. (C)
cf. *Cingulizonates* sp. (VR)
Cycadopites sp. (R)
Granulatisporites sp. (C)
Limbosporites lundbladii (R)
Lunatisporites rhaeticus (R)
cf. *Quadraeculina* sp. (VR)
Stereisporites cicatricosus (R)
Vitreisporites pallidus (C)
Zebrasporites interscriptus (VR)
Z. sp. (R)

Plankton:

Cleistosphaeridium sp. (VR)
Dinoflagellate indet. ?RW. (A)
Micrhystriidium spp. (C)
M. cf. *systemoidium* (R)

Incertae sedis:

Vescicle (R)

Age: Sinemurian.

POLLUX G-60

2584 - 2604'
Core 1

GSC Loc. No.
C-80208

Spores and pollen:

Brachysaccus sp. (R)
cf. *Camerosporites* sp. (R)
Corollina meyeriana (C)
Deltoidospora spp. et. al. (A)
? *Duplicisporites* sp. (R)
Granosaccus ornatus (R)
Ovalipollis ovalis (VR)
Paracirculina quadruplicis (C)
cf. *Rhaetipollis* sp. (R)
Riccisporites tuberculatus (R)
R. sp. (R)
Triadispora spp. (R)
Vitreisporites pallidus (R)
Zebrasporites interscriptus (VR)

Plankton:

Dinoflagellates indet. (C)
Filisphaeridium sp. (C)
Leiofusa jurassica (VR)
Micrhystridium sp. (R)

Other fossils:

Tasmanitid-Crassosphaera sp. (R)

Age: Late Karnian/early Norian.

4500 - 4530'
Core 2

C-80208

Spores and pollen:

Alisporites spp. (R)
? *Camerosporites* sp. (R)
Lunatisporites sp. (R)
Ovalipollis sp. (VR)
Protodiploxylinus sp. (VR)
Protohaploxylinus sp. (VR)
? *Pseudoenzonalasporites* sp. (R)
Striatoabieites aytugii (A)
S. balmei (R)

Plankton:

Micrhystridium sp. (R)
Veryhachium ? riburgense (VR)

Age: Late Ladinian.

SANDY POINT L-46

2525 - 2555'
Core 2

GSC Loc. No.
C-30224

Spores and pollen:

Camerozonosporites rudis (VR)
Camerosporites secatus (R)
C. pseudoverrucatus (R)
Contignisporites sp. (R)
Corollina meyeriana (R)
Granosaccus ornatus (R)
Granuloperculatipollis rudis (R)
Heliosporites altmarkensis (R)
Limbosporites lundbladii (VR)
Ovalipollis ovalis (R)
Lycopodiumsporites sp. (VR)
Paracirculina scurrilis (R)
Polycingulatisporites sp. (A)
Riccisporites sp. (A)

Plankton:

Filisphaeridium sp. (R)
Noricysta fimbriata (A)
N. pannucea (R)
N. varivallata (A)
Hebecysta sp. (R)
Micrhystridium sp. (C)

Age: Norian

SATELLITE F-68

2090 - 2110'
Core 1

C-58206

Spores and pollen:

Annulispora sp. (VR)
Camerozonosporites ? rudis (VR)
Contignisporites sp. (VR)
Corollina meyeriana (R)
Dictyophyllidites mortoni (VR)
Granuloperculatipollis rudis (R)
Limbosporites lundbladii (VR)
Lunatisporites cf. *rhaeticus* (VR)
Lycopodiacidites cf. *rugulatus* (VR)
Ovalipollis ovalis (VR)
Paracirculina scurrilis (R)
P. quadruplicis (R)
Riccisporites tuberculatus (VR)
Stereisporites cicatricosus (VR)

2090 - 2110'

GSC Loc. No.
C-58206

Plankton:

Hebecysta brevicornuta (R)
Heibergella salebrosacea (R)
H. spp. (R)
Micrhystridium sp. (R)
Noricysta sp. (VR)
Rhaetogonyaulax sp. (R)
Sverdrupiella mutabilis (A)
S. usitata (C)
S. downiei, *S. spinosa*, *S. spp.* (R)

Age: Norian.

3667 - 3687'
Core 2

C-58206

Spores and pollen:

Aratrisporites paenulatus (R)
A. cf. strigosus and *A. spp.* (C)
cf. Corisaccites sp. (R)
Cycadopites cf. folliculosa (R)
Densoisporites playfordi (VR)
Equisetosporites steevesi (R)
Infernopollenites claustratus (R)
I. sulcatus and *I. parvus* (R)
Krauselispora sp. (R)
Lunatisporites hexagonalis (R)
L. novimundi/noviaulensis (A)
L. krauseli (C)
Lundbladispores spp. (R)
Nevesisporites limatulus (R)
Platysaccus cf. papilionis (VR)
Protohaploxylinus jacobii (R)
P. spp. (R)
Striatoabietites cf. duivenii (R)
S. balmei (R)

Plankton:

Leiofusa jurassica (R)
Micrhystridium, jekhowskyi and *M. spp.* (C)
Veryhachium triqueter and *V. ? riburgense* (R)

Incertae sedis:

Vesicles. (Large circular, folded) (C)

Reworking:

Palaeozoic spores (R)

Age: Scythian/Anisian transition.

5797 - 5817'
Core 3

GSC Loc. No.
C-58206

Spores and pollen:

Aculeisporites variabilis (VR)
Aratrisporites sp. (R)
Densoisporites sp. (VR)
Klausipollenites decipiens (R)
K. staplinii (A)
K. spp. (R)
Krauselisporites cf. apiculatus (C)
K. spinosus (VR)

Lunatisporites hexagonalis (R)
L. novimundi (C)
L. spp. (C)
Proprisporites pocockii (C)
Protohaploxylinus jacobii (R)
P. samoilovichii (R)
"*Tsugaepollenites*" *jonkeri* (C)
Vitreisporites pallidus (VR)

Plankton:

Veryhachium valensii (VR)

Incertae sedis:

cf. *Linotolypa* (R)
Foveofusa sp. (VR)

Reworking:

Palaeozoic spores and megaspores (R)

Age: Scythian, probably Dienerian.

SHERARD BAY F-14

3900'
Core 2

C-80209

Spores and pollen:

Alisporites sp. (R)
Camerozonosporites rudis (R)
C. sp. (R)
Cingulizonates rhaeticus (R)
Limbosporites lundbladii (R)
Lycopodiacidites rugulatus (A)
Ovalipollis ovalis (VR)
Riccisporites tuberculatus (A)
Semiretispora sp. (VR)
Stereisporites punctatus (VR)

GSC Loc. No.
C-80209

Plankton:

- ? Dinoflagellate (VR)
- Sverdrupiella* sp. (VR)

Reworking:

- Devonian/Carboniferous spores (A)
- Devonian megaspores including the genera
Ancyrospora and *Hystriacosporites*.

Age: Rhaetian

SUTHERLAND O-23

2808 - 2833'
Core 1

C-80207

Spores and pollen:

- Alisporites* spp. (C)
- A. cf. giganteus* (VR)
- Apiculatisporis* sp. (C)
- Aratrisporites* sp. (R)
- Chordosporites singulichorda* (VR)
- cf. Cingulizonates* sp. (VR)
- Lunatisporites rhaeticus* (R)
- cf. Perinopollenites* sp. (R)
- Pinuspollenites* sp. (R)
- Stereisporites cicatricosus* (R)
- Vitreisporites pallidus* (C)

Plankton:

- Heibergella* sp. (VR)
- Micrhystridium* sp. (VR)
- Sverdrupiella* sp. (VR)

Reworking:

- Palaeozoic spores (R)

Age: Early Liassic.

11,636 - 11,658'
Core 3

C-80207

Spores and pollen:

- cf. Aratrisporites* sp. (R)
- Aculeisporites variabilis* (R)
- Cycadopites* sp. (R)
- Densoisporites nejburgii* (C)
- D. sp.* (R)
- Equisetosporites cf. steevesi* (C)
- Kraeuselisporites apiculatus* (VR)
- Lunatisporites* sp. V. (Jansonius) (C)
- Protohaploxylinus samoilovichii* (C)
- P. spp.* (R)

11,636 - 11,658
Core 3

GSC Loc. No.
C-80207

Plankton:

Micrhystridium spp. (A)
including *M. balmei*, *M. castaninum*,
M. jekhowskyi, and *M. teichertii*.
Veryhachium spp. (A)
including *V. valensii* (A)
V. ? ellesmerense (R)

Age: Scythian. Griesbachian/Dienerian.

TALEMAN J-34

6175 - 6205'
Core 1

C-39239

Spores and pollen:

Apiculatisporis spp. (C)
Bisaccates Indet. (R)
Cyclogranisporites sp. (R)
Granulatisporites sp. (C)

Plankton:

Dinoflagellate indet. (R)

? *Mancodinium* sp. (VR)
? *Nannoceratopsis* sp. (VR)
cf. *Rhombodella* sp. (VR)

Incertae sedis:

Microfossil sp. X. (as in Taleman Core 1) (VR)

Age: Probably early Liassic.

9817 - 9877'
Core 2

C-39239

Spores and pollen:

Aratrisporites strigosus (R)
Densoisporites sp. (R)
Infernopollenites parvus (R)
I. sp. (VR)
Krauselisporites apiculatus and *K.* sp. (R)
Lunatisporites acutus (R)
L. noviaulensis/novimundi (A)
L. pellucidus (R)
L. transversundatus (R)
L. krauseli (R)

9817 - 9877'
Core 2

GSC Loc. No.
C-39239

Nevesisporites limatulus (VR)
Protohaploxylinus jacobii (C)
P. samoilovichii (C)
Striatoabieites cf. *balmei* (VR)
S. aytugii (R)

Plankton:

None

Reworked spores:

Palaeozoic spores (R)

Age: Latest Scythian or earliest Anisian.

W. HECLA P-62

3390 - 3450'
Cores 1 & 2

C-80211

Spores and pollen:

Alisporites spp. (C)

Contignisporites problematicus (VR)
? *Camerosporites pseudoverrucatus* (R)
cf. *Corisaccites* sp. (VR)
Illinites kosankei (VR)
Kraeuselisporites sp. (VR)
Lunatisporites acutus (R)
L. noviaulensis (C)
L. pellucidus (R)
cf. *Pseudoenzonalasporites* sp. (R)
Protohaploxylinus sp. (R)
cf. *Rimaesporites* sp. (VR)
Striatoabieites aytugii (VR)
S. balmei (C)
Sulcatisporites sp. (VR)
Triadispora cf. *aurea* (C)
T. spp. including *T. modesta*, *T. obscura* (C)
Verrucosisporites cf. *morulae* (VR)

Plankton:

Micrhystridium sp. (R)

Age: Anisian.

WILKINS E-60

3432 - 3462'
Core 2

GSC Loc. No.
C-30221

Stores and pollen:

Camerosporites sp. (R)
Camerozonosporites sp. (VR)
Granosaccus ornatus (R)
cf. *Inferopollenites* sp. (VR)
Lunatisporites cf. *Krauseli* (R)
Ovalipollis ovalis (R)
O. lunzensis (VR)
Platysaccus cf. *papilionalis* (VR)
Polyoditisporites sp. (R)
Protohaploxypinus sp. (R)
Protodiploxypinus cf. *decus* (R)
P. cf. gracilis (R)
Spiritisorites cf. *spirabilis* (R)
Striatoabietes aytugii (C)
S. balmei (R)
Sulcatisporites sp. (R)
Triadispora sp. (VR)

Plankton:

cf. *Dictyotidium* sp. (R)
Micrhystriidium spp. (A)
Solisphaeridium brevispinosum (C)
Veryhachium ? riburgense (R)
V. sp. (VR)

Reworking:

Palaeozoic spores (VR)

Age: Late Ladinian.