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**PALYNOLOGY OF 75 MESOZOIC FIELD SAMPLES
FROM THE SVERDRUP BASIN OF ARCTIC CANADA**

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INTRODUCTION

Palynological assemblages from 75 field samples collected in the Sverdrup Basin of Arctic Canada are described in this report. They are mostly of Triassic age, but include one Permian sample from Van Hauen Formation of the Blue Mountains.

The samples examined are from Buchanan Lake 79-EL-5; Blue Mountains BM 2, 6, 13, 16, 17, 22, 23, 25, 35, 37, 38, 40, 42, 110; Gilman River 79-EL-16 at 10, 20, 34, 46, 57, 70, 82, 96, 110, 121, 138, 144, 157, 162 metres; Hare Fiord 79-EL-HF 2, 3, 4, 6, 10, 12A, 13, and 14; Hazen Camp Creek 79-EL-29 at 0, 96, 133, 198, and 259 metres; Krieger Mountains 79-EL-KM 12A, 13, 02, 05, 06B, 10, 11A, 16 and 19A; Lake Hagen Cliffs 79-EL-13; McKinley Bay 79-EL-31 at 13, 19, 25, 26.5, 32, 67, 87, 125.5, 196, 290, 327, 344 and 360 metres; Nunatak 79-EL-21 at 30, 87, 104, 135, 156, 174, 381, 400 and 549 metres; and Red Rock Ridge 79-EL-20 at 3 metres.

A summary of the ages of the palynological assemblages is given overleaf (see Table 1 and Chart 1) and each locality is discussed in detail in the following section. Stratigraphically useful and other significant species are listed, together with their relative abundances, for each sample. The assemblages range from basal Triassic, i.e. Griesbachian, throughout the Triassic to Rhaetian in age. The palynological zonation recently proposed by Fisher 1979 for the Sverdrup Basin is used where possible in this report, but this is also supplemented by the authors' own observations and records.

The youngest samples of Norian and Rhaetian age are somewhat problematical. The possible Norian samples differ from the distinctive "Sverdrupiella" assemblage described by Bujak and Fisher 1976 in that they are often either lacking in dinoflagellates or contain indeterminate and questionable dinoflagellates. Instead they contain spores and pollen usually found in the Rhaetian - Norian occasionally intermixed, to a lesser or greater extent with Karnian forms. This is presumably because the sediments examined here were mostly deposited in a marginal environment in contrast with the "Sverdrupiella" assemblages which were described from open marine sediments.

Where the Karnian influence is still strong, Rhaetian species are absent or rare and dinoflagellates are present, a Norian age is inferred. Where Rhaetian species dominate a Rhaetian - ? Norian age is proposed in the absence of distinctive "Sverdrupiella" group dinoflagellates. It is difficult to precisely date Norian/Rhaetian assemblages because the Norian/Rhaetian boundary has not been satisfactorily defined palynologically in either the Sverdrup Basin or the European type sections.

The appearance in some of the youngest samples i.e. Blue Mountains 40, Krieger Mountains 19A and Gilman River 157 m and 162 m of Stereisporites cicatricosus, and also of Lycopodium austroclavatidites and L. semimuris in the Gilman River samples must be treated with caution. These taxa have not previously been recorded in strata older than late Rhaetian/Hettangian elsewhere in the world or in the Sverdrup Basin as far as the author is aware. Their appearance here in strata significantly older than previously recorded i.e. late Karnian - early Norian in Krieger Mountains, 19A, may be the result of contamination. It would be necessary to see numerous samples containing these species before extending their ranges.

TABLE 1

SUMMARY OF RESULTS

FIELD SAMPLE LOCATIONS	GSC. C-Loc. No.	AGE	Environment of deposition*
BUCHANAN LAKE			
79-EL-5	85966	Indeterminable	Indeterminable
BLUE MOUNTAINS			
BM 2	82811	? Scythian	M
BM 6	82816	? Scythian	M
BM 13	82824	? Scythian	Indeterminable
BM 16	82827	? Scythian	M
BM 17	82828	Smithian - ? Spathian	M
BM 22	82835	Late Scythian or younger	NM
BM 23	82838	Ladinian - Karnian	SM
BM 25	82841	Karnian	SM
BM 35	82921	Karnian	M
BM 37	81459	Indeterminable	Indeterminable
BM 38	81460	Norian - very early Rhaetian	?SM
BM 40	81462	Rhaetian	M
BM 42	81465	Rhaetian	SM
BM 110	82809	Indeterminable	Indeterminable
GILMAN RIVER 79-EL-16			
10 m	85369	Scythian, probably Smithian	M
20 m	85370	Scythian	M
34 m	85371	Smithian	M
46 m	85372	Smithian	M
57 m	85374	Late Scythian, prob. Smithian	M
70 m	85375	Late Scythian, prob. Smithian	M
82 m	85376	Scythian, ? Spathian	M
96 m	85377	Scythian, ? Spathian	M
110 m	85379	Indeterminable	Indeterminable
121 m	85380	Indeterminable	NM
138 m	85381	Indeterminable	Indeterminable
144 m	85383	Indeterminable	M
157 m	85386	Very late Rhaetian	M
162 m	85387	Very late Rhaetian	M
HARE FIORD 79-EL-HF			
2	82703	Griesbachian	M
3, 92 m	82704	Griesbachian	M
4, 122 m	82705	Smithian	M
6, 366 m	82709	Indeterminable	M
10	82710	Scythian. Smithian at oldest	M
12A	82718	Ladinian	M
13, 43 m	82720	Indeterminable	M
14, 86 m	82721	Norian - early Rhaetian	SM

FIELD SAMPLE LOCATIONS	GSC. Loc. No.	AGE	Environment of deposition*
HAZEN CAMP CREEK			
79-EL-29, 0 m	82152	Norian - ? early Rhaetian	SM
96 m	82155	Late Spathian - early Anisian	M
133 m	82156	Spathian	M
198 m	82157	Spathian	M
259 m	82158	Scythian, ? Dienerian	M
KRIEGER MOUNTAINS			
79-EL-KM, 12A, at 12 m	82772	Griesbachian	M
13, 115 m	82774	Griesbachian	M
02, 48 m	82779	Early Scythian, undiff.	M
05, 538 m	82782	Early Smithian	M
06B, 586 m	82784	Late Scythian	M
10, 02 m	82789	Middle Triassic, prob. Anisian	M
11A	82790	Indeterminable	M
16	82794	Karnian	M
19A	82798	Late Karnian - early Norian	M
LAKE HAGEN CLIFFS			
79-EL-13, 0 m	85301	Late Scythian, prob. late Spathian	M
McKINLEY BAY			
79-EL-31, 13 m	82182	Griesbachian by inference	?NM
19 m	82183	Griesbachian by inference	Indeterminable
25 m	82184	Griesbachian	M
26.5 m	82185	Barren	Indeterminable
32 m	82186	Griesbachian	M
67 m	85577	Early Smithian	M
87 m	85578	Indet. Smithian by inference	Indeterminable
125.5 m	85582	Smithian	M
196 m	85583	Smithian	M
290 m	85585	Smithian	M
327 m	85586	Late Scythian, undiff.	M
344 m	85587	Late Scythian, undiff.	M
360 m	85588	Late Scythian, undiff	M
NUNATAK 79-EL-21			
30 m	85590	Scythian, probably early	NM
87 m	85563	Indeterminable	?M
104 m	85564	Indeterminable	NM
135 m	85565	Indeterminable	Indeterminable
156 m	85566	Indeterminable	Indeterminable
174 m	85567	Indeterminable	M
381 m	85568	Indeterminable	Indeterminable
400 m	85569	Indeterminable	Indeterminable
549 m	85574	Indeterminable	Indeterminable

FIELD SAMPLE LOCATIONS	GSC. Loc. No.	AGE	Environment of deposition*
RED ROCK RIDGE 79-EL-20, e m	85546	Indeterminable	Indeterminable

*M ----- marine environment of deposition

NM ----- non-marine

SM ----- slight marine influence.

CHART I. (continued)

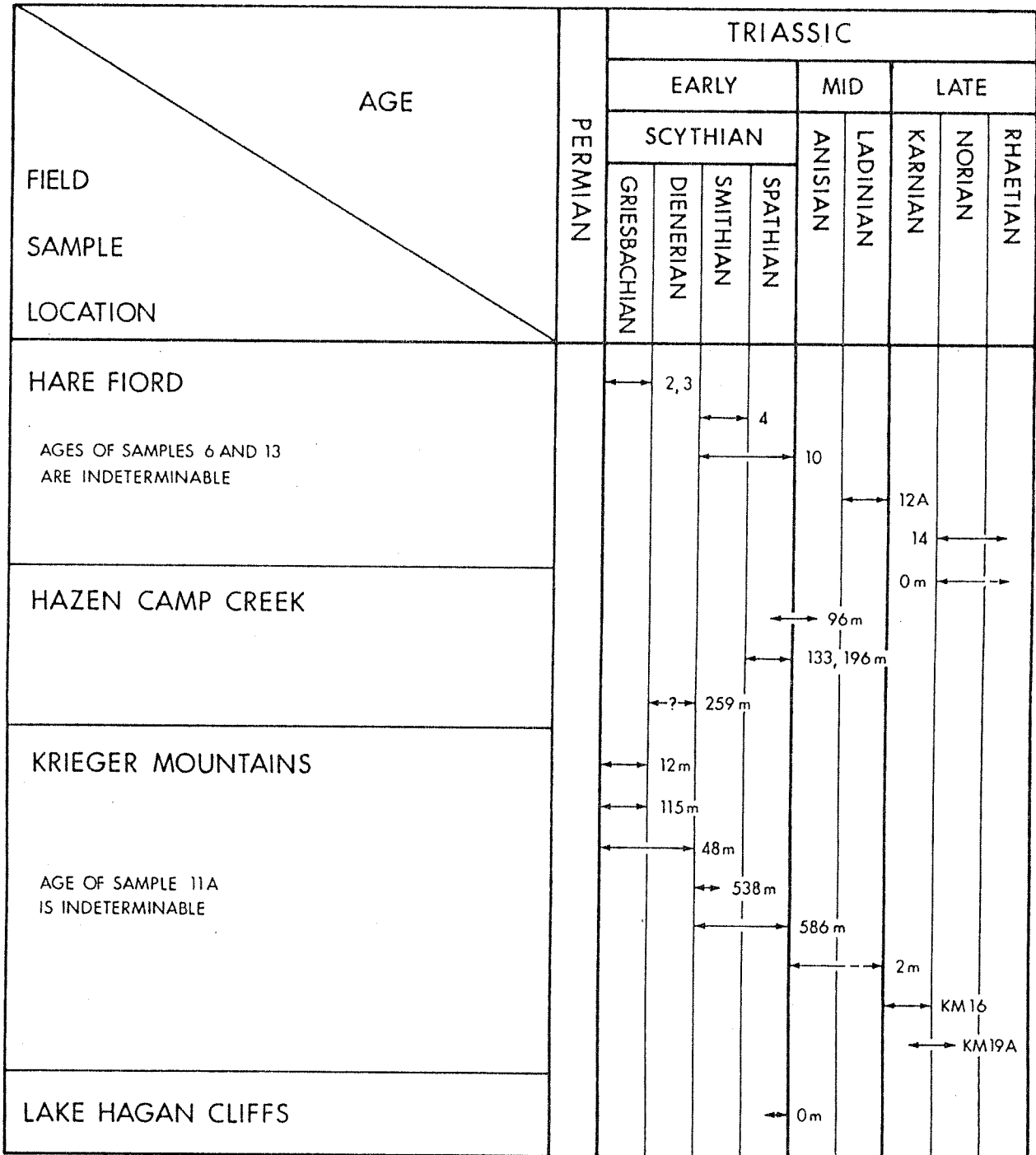


CHART I. (continued)

AGE FIELD SAMPLE LOCATION	PERMIAN	TRIASSIC							
		EARLY			MID	LATE			
		SCYTHIAN			ANISIAN	LADINIAN	KARNIAN	NORIAN	RHAETIAN
		GRIESBACHIAN	DIENERIAN	SMITHIAN					
McKINLEY BAY AGE OF SAMPLE AT 87 m IS INDETERMINABLE			13, 19, 25, 26.5 & 32 m						
			67 m						
			125.5 m						
			196 m						
			290 m						
			327 m						
			344, 360 m						
NUNATAK AGES OF OTHER SAMPLES ARE INDETERMINABLE			30 m						
RED ROCK RIDGE	INDET.								

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INDIVIDUAL SAMPLE
DESCRIPTION, AGE, ENVIRONMENT
AND SPECIES LIST
(in alphabetical order)

Key to Frequency counts

- (VA) ----- Very abundant 100+ specimens recorded from 1 slide
- (A) ----- Abundant 20-100 specimens recorded from 1 slide
- (C) ----- Common 6-20 specimens recorded from 1 slide
- (R) ----- Rare 2-5 specimens recorded from 1 slide
- (VR) ----- Very rare 1 specimen recorded from 1 slide

BUCHANAN LAKE

Sample: 79-EL-5

C-85966

Age: Indeterminable

Environment of deposition: Indeterminable

Remarks: A few possible sporomorphs are interspersed amongst highly carbonised organic debris. There is nothing to indicate the age or environment of deposition of this Van Hauen shale sample.

Microfloral list: Apiculate bodies (R).

BLUE MOUNTAINS

Sample No: BM 110

C-82809

Age: Indeterminable

Environment of deposition: No evidence of marine conditions

Remarks: This sample from the Van Hauen Formation contains abundant carbonised woody fragments and indeterminate spormorphs. A single specimen of Aratrisporites sp. is probably contamination.

Microfloral list: Spores and pollen:

Spores indet. (A)

Aratrisporites sp. (? contam.) (VR)

Samples No: BM 2, BM 6, BM 13, BM 16

Age: ? Scythian

Environment of deposition: Marine

BLUE MOUNTAINS cont'd

Remarks: These four samples from the Blind Fiord Formation contain very few identifiable taxa because of strong carbonisation. A specimen resembling Lunatisporites hexagonalis in sample BM 6 suggest a Scythian age for this part of the section. Acritarchs, chiefly belonging to the genus Micrhystridium are quite numerous in three of the samples, but in BM 13 they are extremely corroded.

Microfloral lists:

BM2: Plankton:

Micrhystridium spp. (C)

BM6: Spores and pollen:

Sporomorphs indet. (C)

Verrucosisporites sp. (R)

Lunatisporites sp. cf. L. hexagonalis (VR)

Cycadopites sp. (R)

Plankton:

Micrhystridium sp. (A)

Veryhachium valensii (VR)

BM13: Spores and pollen:

Sporomorphs indet. (R)

Plankton:

Micrhystridium sp. (R - ?C)

BM16: Spores and pollen:

Sporomorphs indet. (R)

Cycadopites sp. (R)

Leiotriletes sp. (R)

BLUE MOUNTAINS cont'd

BM16: continued

Plankton:

Micrhystridium sp. (C)

Sample No: BM 17

C-82828

Age: Late Scythian, Smithian - ? Spathian

Environment of deposition: Marine

Remarks: This sample from the Blaa Mountain Formation is strongly carbonised and few taxa are identifiable. However, rare taeniate pollen grains belonging to the genus Lunatisporites associated with specimens of Nevesisporites limatulus indicate a late Scythian age.

This species first occurs in the Smithian of the Sverdrup Basin (Fisher 1979) and Western Australia (Dolby and Balme 1976). Its range continues into the Spathian in Western Australia but in lesser numbers. As Nevesisporites limatulus appears relatively numerous in this sample a tentative Smithian age is proposed.

Microfloral list: Spores and pollen:

Alisporites sp. (R)

Lunatisporites sp. (VR)

Nevesisporites limatulus (R)

? Annulispora sp. (R)

cf. Lycopodiumsporites sp. (VR)

Plankton:

Micrhystridium sp. (A)

BLUE MOUNTAINS cont'd

Sample No: BM 22

C-82835

Age: Late Scythian or younger

Environment of deposition: Non-marine

Remarks: Strongly carbonised palynomorphs are numerous but only a few questionable specimens of Striatoabieites sp. can be recognised. This genus first appears in the Smithian and continues into the Karnian.

Microfloral list: Spores and pollen:

Spores and pollen indet. (A)

? Striatoabieites sp. (R)

Sample No: BM 23

C-82838

Age: Ladinian-Karnian

Environment of deposition: Slight marine influence

Remarks: This sample from the Blaa Mountain Formation contains a diverse assemblage of partially carbonised pollen and spores intermixed with abundant woody debris. The occurrence of Striatoabieites aytugii together with Ovalipollis minimus indicates a Ladinian-Karnian age. Brachysaccus ovalis, Granosaccus sp. and Paracirculina scurrilis all have their earliest occurrence in the Ladinian and become more abundant in the Karnian.

The bulk of the assemblage consists of large pollen grains belonging to the genera Alisporites Sulcatisporites, Chordasporites and possibly Ellipsovelatisporites. Marine taxa are very rare but include Micrhystridium sp. and possible dinoflagellates. The presence of possible dinoflagellate cysts tends to favour a Karnian age but this is by no means certain because of the poor state of preservation of the assemblage.

BLUE MOUNTAINS cont'd

BM 23

Microfloral list: Spores and pollen:

- Striatoabieites aytugii (C)
Sulcatisporites sp. cf. S. institatus (C)
Alisporites spp. incl. A. aequalis (C)
Falcisporites sp. (R)
Chordasporites sp. (R)
Platysaccus sp. (R)
Lunatisporites sp. (R)
cf. Ellipsovelatisporites sp. (R)
? Triadispora sp. (VR)
Ovalipollis minimus (R)
O. sp. (R)
Trisaccate pollen (VR)
Contignisporites problematicus (R)
Dictyophyllidites mortoni (R)
Lophotriletes sp. (R)
Aratrisporites sp. (R)
Paracirculina scurrilis (VR)
Cingulizonates sp. (R)
cf. Granosaccus sp. (VR)
Brachysaccus ovalis (R)

Plankton:

- Micrhystridium sp. (R)
? Hebecysta sp. (R)
? Dinoflagellates indet. (R)

BLUE MOUNTAINS cont'd

Sample No: BM 25

C-82841

Age: Karnian

Environment of deposition: Slight marine influence

Remarks: Many large bisaccate pollen grains are intermixed with plant debris in this sample. The assemblage is largely similar to, but less diverse than the underlying one, BM 23. Striatoabieites aytugii and Ovalipollis ovalis are the most frequent forms. Rare specimens of Granosaccus ornatus indicate a Karnian age. Other species present, typical of Karnian strata include Brachysaccus sp., cf. Paracirculina sp., Carnisporites sp. and Striatoabieites aytugii. Specimens of Micrhystridium are very rare in the assemblage.

Microfloral list: Spores and pollen:

Ovalipollis ovalis and O. minimus (C)

Striatoabieites aytugii (A)

Alisporites spp. (C)

Sulcatisporites sp. (R)

Platysaccus sp. (R)

Lunatisporites sp. (R)

Granosaccus ornatus (VR)

Annulispora sp. (VR)

Polycingulatisporites sp. (R)

Dictyophyllidites sp. (R)

Apiculatisporis sp. (R)

? Kraeuselisporites sp. (R)

Paracirculina sp. (VR)

Brachysaccus (R)

Carnisporites sp. (R)

Plankton:

Micrhystridium sp. (R)

BLUE MOUNTAINS cont'd

Sample No: BM 35

C-82921

Age: Karnian

Environment of deposition: Marine

Remarks: Palynomorphs and plant debris are strongly carbonised in this sample.

Specimens of Granosaccus ornatus indicate a Karnian age. Associated forms include Ovalipollis ovalis, Aratrisporites sp. and several indeterminate species of the acritarch genus Micrhystridium.

Microfloral list: Spores and pollen:

Ovalipollis ovalis (R)

Bisaccate pollen indet. (C)

Sulcatisporites sp. (R)

Granosaccus ornatus (VR)

Vitreisporites pallidus (R)

Alisporites sp. (R)

Cycadopites sp. (R)

cf. Protodiploxypinus sp. (VR)

Lunatisporites sp. cf. novimundi (R)

Sporomorphs indet. (A)

Aratrisporites sp. (R)

cf. Contignisporites sp. (VR)

Dictyophyllidites sp. (R)

Lophotriletes sp. (R)

Plankton:

Micrhystridium spp. (C-A)

BLUE MOUNTAINS cont'd

Sample No: BM 37

C-81459

Age: Indeterminable

Environment of deposition: Indeterminable

Remarks: Numerous corroded sporomorphs are intermixed with strongly carbonised plant debris in this sample. Large verrucate forms are present but identification is impeded by the degree of metamorphism. No plankton are present.

Microfloral list: Spores and pollen:

Sporomorphs indet. (A)

Verrucate spore (R)

Sample No: BM 38

C-81460

Age: Norian

Environment of deposition: ? slight marine influence

Remarks: Spores, pollen and woody fragments are abundant but dark brown in colour. The most obvious constituents are large pollen grains, particularly Alisporites giganteus and specimens of Aratrisporites fisheri. Also present are Karnian forms such as Granosaccus ornatus with the typically Rhaeto-Norian species Lunatisporites rhaeticus, Cingulizonates sp. and possibly Semiretisporis sp. As there is little evidence of marine conditions this sample may represent the non-marine equivalent of the "Sverdrupiella" dinoflagellate assemblages described by Bujak and Fisher (1976).

BLUE MOUNTAINS cont'd

Microfloral list: Spores and pollen:

Alisporites giganteus (C)

A. spp. (C)

cf. Pinuspollenites sp. (R)

Granosaccus ornatus (R)

Platysaccus sp. (R)

Lunatisporites rhaeticus (R)

Aratrisporites fischeri (C)

Cingulizonates sp. (R)

? Semiretisporis sp. (R)

Annulispora sp. cf. folliculosa (R)

A. sp. (R)

Stereisporites sp. cf. punctus (VR)

S. sp. (VR)

Plankton:

? Dinoflagellate (VR)

Sample No: BM 40

C-81462

Age: Rhaetian

Environment of deposition: Marine

Remarks: Spores, pollen and woody fragments are abundant but poorly preserved in this residue. A number of Rhaeto-Norian forms is present e.g. Zebrasporites laevigatus, Cingulizonates rhaeticus, Lunatisporites rhaeticus, and forms resembling Limboisporites sp. and Semiretisporis sp. It is however spores such as Iraquispora cf. speciosa, Annulispora sp, Aratrisporites cf. fischeri and long ranging forms which form approximately 60% of the assemblage. Some possible dinoflagellates are present but none is typically Norian in character.

BLUE MOUNTAINS cont'd

The presence of Stereisporites cicatricosus indicates a late Rhaetian-early Liassic influence on the sample. This species is also found in the samples from Krieger Mountains, 19A and Gilman River, 157 and 162 m.

Overall this sample seems most likely to be of Rhaetian age.

Microfloral list: Spores and pollen:

- Alisporites giganteus (R)
- A. spp. (R)
- Chordasporites sp. (R)
- Platysaccus sp. (VR)
- Sulcatisporites sp. (VR)
- Pinuspollenites sp. (R)
- Lunatisporites rhaeticus (VR)
- cf. Granosaccus sp. (VR)
- Aratrisporites sp. cf. fischeri (C)
- cf. Limbosporites sp. (R)
- cf. Semiretisporis sp. (R)
- Deltoidospora sp. (R)
- Iraquispora sp. cf. speciosa (C)
- Annulispora sp. (R)
- Zebrasporites laevigatus (VR)
- Cingulizonates rhaeticus (R)
- Polycingulatisporites sp. (R)
- Stereisporites cicatricosus (R)
- S. perforatus (VR)
- Contignisporites sp. (R)
- Densoisporites sp. (R)

BLUE MOUNTAINS cont'd

Microfloral list: Spores and pollen (cont'd)

Cycadopites sp. (R)

Trilete spores - various (C)

Plankton:

Dinoflagellate indet. (C)

Sample No: BM 42

C-81465

Age: Rhaetian

Environment of deposition: Marginal marine

Remarks: The general preservation is similar to the underlying sample BM 40 but there is a greater percentage of plant debris and fewer spores and pollen in BM 42. A number of possible dinoflagellates is present but none can be specifically identified. Rhaeto-Norian pollen species are again present and include Lunatisporites rhaeticus, Semiretisporis gothae, and Cingulizonates cf. rhaeticus. On the basis of this and the underlying sample, this assemblage is probably of Rhaetian age.

Microfloral list: Spores and pollen:

Alisporites giganteus (R)

Lunatisporites rhaeticus (R)

Sulcatisporites sp. (R)

Alisporites spp. (R)

? Iraquisporites sp. (R)

Stereisporites stereioides (VR)

S. sp. (VR)

Cingulizonates sp. cf. rhaeticus (R)

Contignisporites sp. (VR)

Polycingulatisporites sp. (VR)

BLUE MOUNTAINS cont'd

Microfloral list: Spores and pollen (cont'd)

Semiretisporis gothae (VR)

Densoisporites sp. (VR)

? Riccisporites sp. (VR)

Plankton:

? Noricysta sp. (R)

Possible dinoflagellates (R)

Incertae sedis:

cf. Tytthodiscus sp. (VR)

GILMAN RIVER

Sample No: 79-EL-16 at 10 m.

C-85369

Age: Scythian, probably Smithian

Environment of deposition: Marine

Remarks: The palynomorphs in this sample are so strongly carbonised and fragmented that only a few forms can be recognised. Of these, several indicate a Scythian age i.e. Lunatisporites sp., cf. Aculeisporites sp. and a possible Equisetosporites sp. It is, however, an acritarch resembling Veryhachium ellesmerense which suggests a probable Smithian age. The associated microplankton belonging chiefly to the genus Micrhystridium are overwhelmingly abundant in this sample.

GILMAN RIVER cont'd

Microfloral list: Spores and pollen:

Lunatisporites sp. (R)

Bisaccates pollen (R)

Densoisporites sp. (R)

Lundbladispora sp. (R)

Retusotriletes sp. (R)

? Equisetosporites sp. (VR)

cf. Aculeisporites sp. (R)

Plankton:

Micrhystridium spp. (VA)

Veryhachium valensii (R)

V. valensii var. reductum (R)

V. sp. cf. V. ellesmerense (VR)

Other fossils:

Foraminiferal test (VR)

Sample No: 79-EL-16, at 20 m

C-85370

Age: Scythian, probably no older than Smithian - by inference

Environment of deposition: Marine

Remarks: This sample contains little organic residue and the degree of carbonisation is more severe than in the underlying sample. Scythian forms are again present and the assemblage is dominated by Micrhystridium species although these are somewhat less abundant than in the sample from 10 m.

GILMAN RIVER cont'd

Microfloral list: Spores and pollen:

Lunatisporites hexagonalis (R)

L. novimundi (R)

L. spp. (fragments) (C)

cf. Protohaploxypinus sp. (VR)

Verrucosisporites sp. (R)

Cycadopites sp. (R)

cf. Equisetosporites sp. (R)

Plankton:

Micrhystridium spp. (A)

Samples No: 79-EL-16, at 34 m and 46 m

C-85371 and C-85372

Age: Smithian

Environment of deposition: Marine

Remarks: The presence of several specimens of Nevesisporites limatulus intermixed with taeniate pollen and the lack of Spathian taxa indicates a Smithian age for both samples. This species first appears in the Smithian of the Sverdrup Basin (Fisher 1979) and Western Australia (Dolby and Balme 1976). Acritarchs, although they again play a dominant part in both assemblages, do not help significantly to refine the Scythian age.

Microfloral lists:

34 m.

Spores and pollen:

Lunatisporites hexagonalis (C)

L. novimundi (R)

L. sp. indet (C)

Densoisporites sp. (R)

Nevesisporites limatulus (R)

GILMAN RIVER cont'd

Microfloral lists (cont'd)

34 m. Spores and pollen:

Cycadopites sp. (R)

Verrucosisporites sp. (R)

Equisetosporites steevesi (VR)

Protohaploxylinus sp. (VR)

Plankton:

Micrhystridium spp. (A)

Leiosfusa jurassica (VR)

Other fossils:

Foraminiferal test (R)

46 m. Spores and pollen:

Lunatisporites hexagonalis (R)

L. novimundi (R)

L. sp. (fragments) (R)

Verrucosisporites sp. (R)

Cycadopites sp. (R)

Nevesisporites limatulus (VR)

Plankton:

Micrhystridium spp. (A)

Veryhachium sp. (R)

Samples No: 79-EL-16, at 57 m and 70 m

C-85374 and C-85375

Age: Late Scythian, probably Smithian

Environment of deposition: Marine

Remarks: Both samples contain very carbonised and corroded palynomorphs with numerous poorly preserved acritarchs belonging to the genus Micrhystridium.

GILMAN RIVER cont'd

The sample from 57 m marks the first undoubted occurrence of the genus Aratrisporites in this section. The earliest specimens of this genus are recorded in the Smithian of the Sverdrup Basin. Although this form, together with Nevesisporites limatulus ranges throughout the Spathian, the lack of Spathian markers suggests a Smithian rather than Spathian age. The assignation must remain tentative, however, due to the poor preservation.

Microfloral lists:

57 m.

Spores and pollen:

Lunatisporites hexagonalis (R)

L. sp. indet. (R)

Sporomorphs indet. (R)

Aratrisporites sp. (VR)

Plankton:

Micrhystridium spp. (A)

Other fossils:

Foraminiferal test (VR)

70 m.

Spores and pollen:

Lunatisporites sp. (R)

? Protohaploxypinus sp. (R)

cf. Aratrisporites sp. (VR)

Sporomorphs indet. (R)

Plankton:

Micrhystridium spp. (A)

GILMAN RIVER cont'd

Sample No: 79-El-16 at 82 m

C-85376

Age: Scythian, ? Spathian

Environment of deposition: Marine

Remarks: The state of preservation deteriorates in this sample and very few palynomorphs are recognisable. A Scythian age is suggested by a specimen resembling Lunatisporites novimundi. Two possible representatives of the genus Striatoabieites may indicate a Spathian age. Abundant acritarchs belonging to the genus Micrhystridium indicate a marine environment of deposition.

Microfloral list: Spores and pollen:

Lunatisporites sp. cf. L. novimundi (VR)

? Striatoabieites sp. (R)

Sporomorphs indet. (R)

Plankton:

Micrhystridium spp. (A)

Sample No: 79-EL-16, at 96 m

C-85377

Age: Late Scythian, ? Spathian

Environment of deposition: Marine

Remarks: The small quantity of highly carbonised organic residue from this sample yielded very few taxa. However, a single specimen of Nevesisporites limatulus, together with a specimen of Lunatisporites sp. suggests a Late Scythian age. The presence of a specimen of Annulispora sp. may point to a Middle Triassic influence suggesting a Spathian age for the sample. However, this must remain tentative. Unidentifiable representatives of the acritarch genus Micrhystridium occur frequently in this assemblage from the Blind Fiord Formation.

GILMAN RIVER cont'd

Microfloral list: Pollen and spores:

Lunatisporites sp. (VR)

Deltoidospora sp. (VR)

Annulispora sp. (VR)

Vitreisporites sp. (VR)

Nevesisporites limatulus (VR)

Plankton:

Micrhystridium sp. (C)

Sample No: 79-EL-16, at 110 m

C-85379

Age: Indeterminable

Environment of deposition: Indeterminable

Remarks: Rare indeterminable sporomorphs occur in this highly carbonised sample. The environment of deposition cannot be determined.

Sample No: 79-EL-16, at 121 m

C-85380

Age: Indeterminable

Environment of deposition: Non-marine

Remarks: Few taxa are recognisable in this strongly carbonised sample from the Blind Fiord Formation. Rare striate pollen grains are present but they are so poorly preserved that definite identification is precluded. No plankton are present.

Microfloral list: Spores and pollen:

? Striatoabieites sp. (R)

Vitreisporites sp. (VR)

cf. Kraeuselisporites sp. (VR)

? Ovalipollis sp. (VR)

Megaspore indet. (VR)

? Striatopodocarpites sp. (VR)

Contamination - pollen

GILMAN RIVER cont'd

Samples No: 79-EL-16 at 138 m and 144 m C-85380 and C-85383

Age: Indeterminable

Environment of deposition: Indeterminable for 138 m. C-85383 is marine

Remarks: Neither of these samples from the Schei Point Formation contain any identifiable palynomorphs except for poorly preserved acritarchs in the younger sample.

Microfloral lists:

138 m. Sporomorphs indet. (R)

144 m. Michrhystridium sp. indet. (R)

Samples No: 79-El-16, at 157 m and 162 m C-85386 and C-85387

Age: Very late Rhaetian

Environment of deposition: Marine

Remarks: Spores, pollen and dinoflagellates are abundant but somewhat carbonised in both samples. These two assemblages contain many species in common. They are considered to be of late Rhaetian age, based on the presence of Rhaetian pollen and spores, the occurrence of cf. Comparodinium sp., possible Rhombodella sp. and of some typically Jurassic spore species.

Rhaetian species include Cingulizonates rhaeticus, Lunatisporites rhaeticus, Triancoraesporites anchorae, Zebrasporites interscriptus, and Semiretisporis sp. cf. S. gothae. Species present which are generally found in the early Liassic of the Arctic are Stereisporites cicatricosus, Lycopodiumsporites semimuris and forms of Annulispora sp. This latter element is more pronounced in the younger sample. As far as the author is aware these species have not been recorded in sediments older than very late Rhaetian.

GILMAN RIVER cont'd

The underlying sample is richer in dinoflagellates, some of which belong to the Norian genus Sverdrupiella. Small undescribed microplankton are also common. The significance of rare specimens of a form strongly resembling Comparodinium in both samples is uncertain. Morbey (1975) records representatives of this genus from the late Rhaetian to Hettangian from the Kendlebachgraben of Austria. The presence of typically Karnian forms such as Striatoabieites aytugii and Granosaccus sp. suggests that there was some recycling of earlier Triassic sediments. This may also explain the presence of large numbers of Sverdrupiella specimens in the lower sample (157 m) in which there is also a strong Jurassic influence.

Microfloral lists:

157 m.

Spores and pollen:

Alisporites sp. cf. A. robustus (R)

A. sp. (R)

Vitreisporites pallidus (R)

Lunatisporites rhaeticus (R)

"Lueckisporites" cf. triassicus (R)

cf. Granosaccus sp. (R)

Striatoabieites aytugii (VR)

Aratrisporites fisheri and A. sp (C)

A. sp. (R)

Lophotriletes sp. (R)

Annulispora folliculosa (R)

Contignisporites sp. (R)

Lycopodiumsporites austroclavatidites (VR)

Iraquispora laevigata (R)

GILMAN RIVER cont'd

Microfloral lists (cont'd)

157 m.

Spores and pollen:

Stereisporites cicatricosus (R)

S. antiquasporites (R)

S. punctus (R)

Triancoraesporites anchorae (R)

Cingulizonatisporites rhaeticus (R)

Corollina sp. (R)

Densoisporites sp. (R)

Perinosporites sp. cf. thuringiacus (R)

Polycingulatisporites sp. (R)

Plankton:

Sverdrupiella downiei and S. spp. (C)

? Heibergella sp. (R)

Dinoflagellates indet. (C)

Veryhachium sp. (R)

cf. Comparodinium sp. (R)

162 m.

Spores and pollen:

Alisporites sp. cf. A. robustus (R)

A. spp. (R)

Pinuspollenites minimus (R)

Semiretisporis sp. cf. S. gothae (R)

Iraquispora speciosa (R)

Annulispora sp. (C)

Stereisporites cicatricosus (C)

S. antiquasporites (R)

GILMAN RIVER cont'd

Microfloral lists (cont'd)

162 m. Spores and pollen:

Aratrisporites sp. (R)

Lycopodiumsporites semimuris (VR)

Raistrickia sp. (VR)

Acanthotriletes sp. (R)

Cingulizonates sp. (R)

Densoisporites sp. (R)

Zebrasporites interscriptus (VR)

Z. cf. laevigatus (VR)

Polycingulatisporites sp. (VR)

Plankton:

Veryhachium sp. (R)

cf. Sverdrupiella sp. (R)

Dinoflagellates indet. (R)

cf. Comparodinium sp. (R)

? Rhombodella sp. (VR)

HARE FIORD

Sample No: 79-EL-HF2

C-82703

Age: Early Scythian, Griesbachian by inference

Environment of deposition: Marine

Remarks: This sample from the Blind Fiord Formation contains numerous strongly carbonised microfossils amongst plant debris. Taeniate pollen belonging to

HARE FIORD cont'd

the genus Lunatisporites is abundant and typical of the Scythian. The presence of Equisetosporites steevesi indicates an early Scythian age. The occurrence of frequent Griesbachian markers in the overlying sample further restricts the age of this sample to Griesbachian. Specimens of Klausipollenites similar to those recorded by Jansonius (1962) from the Peace River are particularly abundant in this sample.

Microfloral list: Spores and pollen:

- Lunatisporites novimundi (A)
- L. hexagonalis (C)
- L. spp. (fragments) (A)
- Klausipollenites staplinii (A)
- K. sp. 'Y', Jansonius 1962 (R)
- Protohaploxylinus sp. (VR)
- Equisetosporites steevesi (R)
- Cycadopites minimus (R)
- Aculeisporites variabilis (R)
- Apiculatisporites sp. (R)

Plankton:

- Micrhystridium spp. including M. fragile (C)

Other fossils:

- ? Fungal spores (R)
- Oval body indet. (VR)

HARE FIORD cont'd

Sample No: 79-EL-HF3 at 92 m

C-82704

Age: Griesbachian

Environment of deposition: Marine

Remarks: Many of the same species found in the underlying sample are again recorded here. This assemblage is almost certainly Griesbachian as it contains many fungal bodies belonging to the morphotype Foveofusa (Staplin, in press) which are typically found in the earliest Scythian. Various other supposedly fungal bodies and cysts which are as yet undescribed are also present. Equisetosporites steevesi and E. scottii are less frequent in this sample. Specimens resembling Weylandites sp. which commonly occurs in the late Permian are presumed to have been reworked. Several other species described by Jansonius (1962) from the Peace River of Western Canada are present e.g. Aculeisporites variabilis, Striatopodocarpites jacobii and Cycadopites minimus.

Marine microplankton are abundant with Veryhachium valensii dominating over species of Micrhystridium.

Microfloral list: Spores and pollen:

Lunatisporites novimundi (VA)

L. hexagonalis (C)

Striatopodocarpites jacobii (R)

Klausipollenites sp. 'Y' (Jansonius '62) (R)

K. sp. (R)

Equisetosporites steevesi (R)

E. scottii (VR)

Densoisporites sp. RW (VR)

HARE FIORD cont'd

Microfloral list: Spores and pollen (cont'd)

Aculeisporites variabilis (R)

Cycadopites minimus (R)

Weylandites sp. (C)

Plankton:

Veryhachium valensii (A)

V. sp. cf. V. riburgense (R)

Michrhystridium spp. (C) including

M. gregarium, M. jekhowskyi

Filisphaeridium sp. (R)

Other fossils:

Foveofusa sp. (C)

Folded ? cyst (R)

? Fungal body (R)

Foraminiferal test (R)

Sample No: 79-EL-HF4 at 122 m

C-82705

Age: Smithian

Environment of deposition: Marine

Remarks: Pollen and spores are abundant and fairly well preserved in this sample from the Blind Fiord Formation. The presence of several specimens of Aratrisporites sp. suggests a Smithian age. No Spathian markers are present. The bulk of the assemblage consists of taeniate pollen grains and other species described by Jansonius (1962) e.g. Lunatisporites novimundi, L. hexagonalis, Protohaploxylinus samoilovichii, Aculeisporites variabilis. Rare Equisetosporites spp. and a specimen of Foveofusa indicate an early Scythian influence on the sample. A single specimen of Weylandites was probably

HARE FIORD cont'd

reworked. Acritarchs form approximately 70% of the assemblage with Micrhystridium species far more abundant than Veryhachium valensii.

Microfloral list: Spores and pollen:

Lunatisporites novimundi (A)

L. hexagonalis (C)

Protohaploxylinus samoilovichii (R)

Klausipollenites vestitus (R)

K. sp. (R)

Aratrisporites sp. (R)

Aculeisporites variabilis (R)

Densoisporites sp. cf. D. playfordi (R)

D. nejburgii (R)

Equisetosporites steevesi (R)

E. multistriatus (VR)

Cycadopites minimus (R)

Weylandites sp. (VR)

Spores, long-ranging (R)

Plankton:

Micrhystridium gregarium (A)

M. spp. (C)

Veryhachium valensii (A)

Filisphaeridium sp. (R)

Other fossils:

Foraminiferal test (R)

Foveofusa sp. (VR)

HARE FIORD cont'd

Sample No: 79-EL-HF-6 at 366 m

C-82709

Age: Indeterminable

Environment of deposition: Marine

Remarks: The assemblage is highly carbonised and few forms can be recognised. As no stratigraphically useful species are present the age must remain uncertain.

Microfloral list: Sporomorphs (R)

? Fungal body (VR)

Micrhystridium sp. indet. (C)

Sample No: 79-EL-HF-10

C-82710

Age: Scythian. Smithian at the oldest, by inference

Environment of deposition: Marine

Remarks: Although this sample is strongly carbonised, several taxa can be identified. Pollen grains belonging to the genus Lunatisporites are the most common non-marine element. Although the majority cannot be specifically identified, some resemble L. novimundi which would indicate a Scythian age. This assemblage is Smithian at the oldest by inference from the underlying sample at 122 m. Specimens of Micrhystridium spp. are abundant, indicative of a marine environment of deposition.

Microfloral list: Spores and pollen:

Lunatisporites sp. indet. (C)

L. sp. cf. L. novimundi (R)

Cycadopites sp. (R)

? Aratrisporites sp. (VR)

Sporomorphs indet. (C)

Densoisporites sp. cf. D. nejburgii (VR)

HARE FIORD cont'd

Microfloral list (cont'd)

Plankton:

Michrhystridium gregarium (A)

M. spp. (A)

Filisphaeridium sp. (R)

Sample No: 79-EL-HF-12A

C-82718

Age: Ladinian

Environment of deposition: Marine

Remarks: The preservation of this assemblage is similar to the underlying sample but it contains a different microflora. The presence of the genus Ovalipollis indicates a Ladinian or younger age. Other important taxa present, which are typical of the Middle and Late Triassic, are Striatoabieites spp., cf. Infernopollenites, Triadispora sp. and pollen with reduced sacchi probably belonging to the genus Protodiploxypinus. The presence of cf. Infernopollenites a form usually found in the middle Triassic, together with lack of Karnian markers, points to a Ladinian age. The remainder of the sample is composed of longer ranging pollen and acritarchs, with forms belonging to the genus Filisphaeridium being most noticeable.

Microfloral list: Spores and pollen:

Striatoabieites aytugii (R)

S. sp. cf. S. balmei (R)

S. sp. fragments (R)

Lunatisporites noviaulensis (R)

L. sp. (R)

Alisporites spp. (C)

HARE FLORD cont'd

Microfloral list: Spores and pollen (cont'd)

Protohaploxypinus sp. (VR)

Sulcatisporites sp. (R)

Ovalipollis ovalis (R)

O. sp. cf. O. minimus (VR)

cf. Infernopollenites sp. (VR)

cf. Protodiploxypinus sp. (R)

cf. Samaropollenites sp. (VR)

? Patinasporites sp. (VR)

Cycadopites spp. (C)

Aratrisporites sp. (R)

cf. Nevesisisporites sp. (VR)

Verrucosisporites sp. (R)

cf. Densoisporites sp. (VR)

Triadispora sp. (VR)

Plankton:

Micrhystridium spp. (C)

Veryhachium valensii (R)

Filisphaeridium sp. (C)

Sample No: 79-EL-HF-13 at 43 m

C-82720

Age: Indeterminable

Environment of deposition: Marine

Remarks: The deterioration in preservation precludes the identification of any stratigraphically useful forms in this sample. Although pollen and spores are very rare and carbonised there are some marine microplankton present.

HARE FIORD cont'd

Forms belonging to the genus Filisphaeridium (Staplin, in press) are associated with very poorly preserved specimens of Micrhystridium.

Microfloral list: Spores and pollen:

Sporomorphs indet. (R)

? Alisporites sp. (VR)

? Ovalipollis sp. (VR)

Plankton:

Filisphaeridium sp. (R)

Micrhystridium sp. (R)

Sample No: 79-EL-HF-14 at 86 m.

C-82721

Age: Norian - early Rhaetian

Environment of deposition: Slight marine influence

Remarks: Spores and pollen are still poorly preserved but slightly better so than in the underlying assemblage. The microflora is distinctly different from HF 12A. The frequent occurrence of Rhaeto-Norian forms such as Iraquispora laevigata, Cingulizonates sp. cf. C. rhaeticus, Densoisporites sp. cf. D. irregularis and possible specimens of Zebrasporites laevigatus and Triancoraesporites sp. indicate a Norian to early Rhaetian age for the sample. The few poorly preserved and indeterminate dinoflagellates do not resemble the Norian forms described by Bujak and Fisher (1975). There remains the possibility that this is the less marine, lateral equivalent of the Norian dinoflagellate assemblages.

HARE FIORD cont'd

Microfloral list: Spores and pollen:

Alisporites sp. cf. A. giganteus (C)

Bissacates indet. (C)

Chordasporites sp. (VR)

cf. Triancoraesporites sp. (VR)

Iraquispora laevigatus (C)

I. sp. cf. I. speciosa (R)

Zebrasporites sp. cf. Z. laevigatus (VR)

Annulispora sp. (R)

cf. Stereisporites sp. (R)

Contignisporites sp. (VR)

? Cingulizonates sp. (R)

cf. Densoisporites sp. (R)

D. sp. cf. D. irregularis (VR)

cf. Semiretisporis sp. (R)

Dictyophyllidites mortoni (R)

Aratrisporites sp. (VR)

Plankton:

Dinoflagellates indet. (R)

HAZEN CAMP CREEK

Sample No: 79-EL-29 at 0 m

C-82152

Age: Norian - ? early Rhaetian

Environment of deposition: Marine influence

Remarks: This sample is similar to the sample from Hare Fiord (86 m) and has much in common with BM 40 from Blue Mountains. Palynomorphs and frequent plant fragments are intermixed with occasional forms resembling dinoflagellates. Rhaeto-Norian spore and pollen species such as Zebrasporites interscriptus, Triancoraesporites sp., Densoisporites sp. cf. irregularis, Lunatisporites sp. cf. rhaeticus, cf. Limbosporites and cf. Semiretisporis sp. form a significant part of the assemblage. However, large pollen grains chiefly belonging to the genus Alisporites are the main constituent. Various forms found in the late Karnian are present e.g. Paracirculina sp., Granosaccus sp. and possible specimens of Parcisporites, Striatoabieites and Triadispora suggesting that the sample is more likely to be Norian than Rhaetian in age. None of the possible dinoflagellate cysts can be specifically identified, but they do not resemble the published Norian taxa. It is possible that this assemblage represents a lateral facies equivalent of the "Sverdrupiella" assemblages of Bujak and Fisher (1976).

Microfloral list: Spores and pollen:

Alisporites giganteus (C)

A. spp. (C)

Lunatisporites sp. cf. L. rhaeticus (R)

cf. Triadispora sp. (R)

Ovalipollis ovalis (VR)

Sulcatisporites sp. (R)

HAZEN CAMP CREEK cont'd

Microfloral list: Spores and pollen (cont'd)

cf. Parcisporites sp. (VR)

cf. Striatoabieites sp. (VR)

Chordasporites sp. (R)

Iraquispora laevigata (R)

I. sp. (VR)

Paracirculina sp. (VR)

Annulispora folliculosa and A. sp. (R)

Contignisporites problematicus (R)

Camerozonosporites sp. (R)

Granosaccus sp. (R)

Long ranging spores (C)

Chasmatosporites sp. (R)

Densoisporites sp. cf. D. irregularis (R)

D. sp. (R)

Aratrisporites sp. (R)

Lundbladispota sp. (VR)

Cycadopites sp. cf. C. acerrimus (VR)

cf. Semiretisporis sp. (R)

Triancoraesporites sp. (VR)

Polycingulatisporites sp. (VR)

cf. Limbosporites sp. (R)

Zebrasporites interscriptus (R)

Stereisporites punctus (R)

HAZEN CAMP CREEK cont'd

Microfloral list (cont'd)

Plankton:

? Dinoflagellates indet. (C)

Veryhachium irregulare (VR)

Reworking:

Palaeozoic spores and megaspore (R)

Sample No: 79-EL-29 at 96 m

C-82155

Age: Late Spathian - early Anisian

Environment of deposition: Marine

Remarks: The dominant pollen in this sample is Striatoabieites aytugii and various species of Lunatisporites including L. noviaulensis, L. acutus and L. Krauseli which suggest the sample is of late Scythian to early Anisian age. "Lueckisporites", Infernopollenites parvus and cf. Sulcatisporites represent the younger influence. Nevesisporites limatulus is very rare here. This form dies out in the earliest Anisian (Dolby and Balme 1976). Spores belonging to the genera Kraeuselisporites, Lundbladispota and Densoisporites, Cyclogranisporites and Verrucosisporites form a significant part of the assemblage. The marine fraction is composed of frequent specimens of Filisphaeridium spp.

Microfloral list: Spores and pollen:

Striatoabieites aytugii (A)

Lunatisporites noviaulensis (C)

L. Krauseli (R)

L. acutus var. nudus (R)

L. spp. fragments (C)

HAZEN CAMP CREEK cont'd

Microfloral list: Spores and pollen (cont'd)

Infernopollenites parvus (R)

Alisporites landianus (R)

A. spp. (C)

Chordasporites sp. (R)

cf. Sulcatisporites sp. (R)

"Lueckisporites" sp. (R)

cf. Triadispota sp. (VR)

Nevesisporites limatulus (VR)

Densoisporites sp. (R)

Lundbladispota sp. (R)

Cyclogranisporites sp. (R)

cf. Annulispora sp. (VR)

Verrucosisporites sp. (R)

Plankton:

Filisphaeridium spp. (C)

Veryhachium valensii (R)

Samples No: 79-EL-29 at 133 m and 198 m

C-82156 and 82157

Age: Spathian

Environment of deposition: Marine

Remarks: These two samples are grossly similar in character. They contain several species of Lunatisporites including L. noviaulensis, L. Krauseli and L. acutus in association with infrequent pollen grains of late Scythian-Anisian character such as "Lueckisporites" triassicus, species of Alisporites, Infernopollenites and Sulcatisporites. A Spathian age is assigned to these samples because of the frequency of taeniate forms and the obvious Middle Triassic influence.

HAZEN CAMP CREEK cont'd

Microfloral lists:

133 m.

Spores and pollen:

Lunatisporites Krausei (R)

L. noviaulensis (R)

L. acutus (R)

L. sp. indet. (C)

Alisporites landianus (R)

Sulcatisporites sp. (R)

Infernopollenites sp. (R)

Lueckisporites triassicus (VR)

Krauselisorites sp. (Tetrad) (R)

Cyclogranisorites sp. (R)

Nevesisorites limatulus (R)

? Polypodiumsporites (R)

Plankton:

Filisphaeridium sp. (A)

Micrhystridium sp. (C)

Other fossils:

? Fungal spores (A)

198 m.

Spores and pollen:

Lunatisporites acutus (C)

L. noviaulensis (R)

L. Krausei (VR)

Alisporites sp. (R)

Sulcatisporites sp. (R)

HAZEN CAMP CREEK cont'd

Microfloral lists:

198 m. Spores and pollen (cont'd)

Striatoabieites sp. (VR)

Chordasporites sp. (VR)

Lueckisporites sp. cf. L. triassicus (VR)

? Polypodiumsporites sp. (C)

Kraeuselisporites sp. (VR)

Cyclogranisporites sp. (VR)

Cycadopites sp. (R)

Plankton:

Filisphaeridium spp. (A)

Micrhystridium spp. (A)

Leofusa jurassica (C)

Veryhachium valensii (VR)

Other fossils:

? fungal spores (R)

Reworking:

Possible Palaeozoic spores (R)

Sample No: 79-EL-29 at 259 m

C-82158

Age: Scythian, ? Dienerian

Environment of deposition: Marine

Remarks: This assemblage contains taeniate pollen and numerous specimens of the Kraeuselisporites/Densoisporites spore groups. Fisher 1979 states that this group may be abundant in the Dienerian. However, the relative lack of stratigraphically useful taxa makes this assignation uncertain.

HAZEN CAMP CREEK cont'd

Microfloral list: Spores and pollen:

- Lunatisporites noviaulensis (C)
- L. acutus (R)
- L. cf. transversundatus (R)
- L. sp. cf. Kraeuseli (R)
- L. sp. ? multiplex (R)
- L. sp. fragments indet. (C)
- Protohaploxylinus sp. cf. P. jacobii (VR)
- ? Lueckisporites sp. (VR)
- Alisporites sp. (R)
- ? Chordasporites sp. (R)
- ? Equisetosporites sp. (R)
- Densoisporites sp. (R)
- cf. Krauselisporites sp. (C)
- Lundbladispota sp. (VR)
- Verrucosisporites sp. (R)
- ? Polypodiumsporites sp. (R)

Plankton:

- Filisphaeridium spp. (C)
- Micrhystridium spp. (C)

Other fossils:

- Foraminiferal tests (R)

KRIEGER MOUNTAINS

Sample No: 79-EL-KM-12A at 12 m

C-82772

Age: Griesbachian

Environment of deposition: Marine

Remarks: This very poor sample contains a few highly carbonised spores, pollen and acritarchs. The microplankton consist of both Permian and Triassic forms. Delicate forms of ? Veryhachium irregulare and Micrhystridium sp. cf. M. densispinum more typical of the Permian are intermixed with M. sp. cf. M. breve and V. valensii var. reductum.

Pollen grains are chiefly unrecognisable but specimens of Protohaploxylinus sp. cf. P. varius, Striatopodocarpites sp. cf. S. pantii and cf. Ephedripites are long-ranging Permian forms. Other pollen grains are Triassic in character indicating that the sample is probably lowermost Triassic i.e. Griesbachian.

Microfloral list: Spores and pollen:

Protohaploxylinus sp. cf. P. limpidus (VR)

P. sp. cf. P. varius (R)

Striatopodocarpites sp. cf. S. pantii (VR)

Lunatisporites sp. (R)

Alisporites sp. (R)

Bisaccates indet. (C)

Lundbladispota sp. (R)

Densoisporites sp. (R)

Cycadopites sp. (R)

cf. Ephedripites sp. (VR)

KRIEGER MOUNTAINS cont'd

Microfloral list: Plankton:

Micrhystridium sp. cf. M. breve (C)

M. sp. cf. M. densispinum (C)

M. spp. (C)

? Veryhachium irregulare (R)

V. valensii var. reductum (R)

Sample No: 79-EL-KM-13 at 115 m

C-82774

Age: Griesbachian

Environment of deposition: Marine

Remarks: This is an unusually rich and well preserved assemblage of spores, pollen and microplankton intermixed with plant fragments. Common specimens of Linotolypa sp. and other possible fungal bodies indicate a Griesbachian date. Equisetosporites steevesi is also present. The bulk of the rich pollen fraction consists of Lunatisporites novimundi which shows great inter-specific variation. Other components of the assemblage which are commonly found in the early Scythian are Densoisporites playfordi, Aculeisporites variabilis and Lunatisporites hexagonalis. A small quantity of Permian pollen is present e.g. Protohaploxypinus varius, P. spp. and Densipollenites sp. Acritarchs form approximately 80% of the total assemblage with several species of Micrhystridium greatly outnumbering Veryhachium species.

Microfloral list: Spores and pollen:

Lunatisporites novimundi (VA)

L. hexagonalis (R)

L. transversundatus (R)

Klausipollenites decipiens (R)

Alisporites sp. (R)

KRIEGER MOUNTAINS cont'd

Microfloral list: Spores and pollen (cont'd)

Aculeisporites variabilis (R)

Densoisporites playfordi (R)

Equisetosporites steevesi (R)

Cycadopites minimus (R)

Acanthotriletes sp. indet. (R)

Plankton:

Micrhystridium spp. including

M. breve, M. jekhowskyi and others (VA)

Veryhachium valensii (A)

V. irregulare (R)

V. triqueter (R)

Other fossils:

Linotolypa (C)

? Fungal body (R)

Foraminiferal test (VR)

Reworking:

Permian pollen (R)

Sample No: 79-EL-KM-02 at 48 m

C-82779

Age: Early Scythian, undifferentiated

Environment of deposition: Marine

Remarks: This assemblage contains many partially carbonised microfossils and wood fragments belonging to a restricted number of species. The frequent occurrence of Equisetosporites steevesi points to an early Scythian age. The lack of other stratigraphically useful species prevents a more precise

KRIEGER MOUNTAINS cont'd

assignation. A form of Cycadopites described by Jansonius (1962) from the early Triassic of the Peace River is particularly numerous. Marine microplankton are less frequent than in the underlying sample.

Microfloral list: Spores and pollen:

Equisetosporites steevesi (C)

Cycadopites sp. "K" (Jansonius 1962) (A)

C. sp. cf. C. follicularis (R)

Densoisporites sp. (R)

Sporomorphs indet. (A)

? Fungal spores (R)

Plankton:

Micrhystridium spp. (A)

Veryhachium valensii (R)

Sample No: 79-EL-KM 05 at 538 m

C-82782

Age: Early Smithian

Environment of deposition: Marine

Remarks: Frequent poorly preserved spores and pollen are intermixed with much plant detritus. Pollen is often fragmented and corroded. Taeniate pollen grains form the bulk of the assemblage but it is rare specimens of Nevesisporites limatulus and a form resembling Veryhachium ellesmerense which suggest an early Smithian age. The Griesbachian-Dienerian influence, as represented by Lundbladispora sp., Equisetosporites steevesi and Densoisporites sp. and cf. Linotolypa, is still significant. Acritarchs occur quite frequently in the assemblage.

KRIEGER MOUNTAINS cont'd

Microfloral list: Spores and pollen:

Lunatisporites novimundi (A)

L. hexagonalis (R)

Protohaploxylinus sp. cf. limpidus RW (VR)

P. jacobii (R)

Equisetosporites steevesi (R)

Densoisporites playfordi (R)

D. sp. (R)

Lundbladisporea sp. (R)

Nevesisporites sp. (R)

Cycadopites sp. cf. C. follicularis (R)

Alisporites sp. (R)

Plankton:

Micrhystridium spp. (C)

Veryhachium valensii (R)

V. cf. V. ellesmerense (VR)

Other fossils:

cf. Linotolypa sp. (VR)

Sample No: 79-EL-KM-06B at 586 m

C-82784

Age: Late Scythian

Environment of deposition: Marine

Remarks: Infrequent corroded spores and pollen are intermixed with woody fragments in this sample. The presence of Nevesisporites in association with Lunatisporites spp. indicates a late Scythian age. The abundant, though poorly preserved, marine microplankton belong to the genus Micrhystridium.

KRIEGER MOUNTAINS cont'd

Microfloral list: Spores and pollen:

Lunatisporites sp. indet. (C)

L. hexagonalis (VR)

L. sp. cf. L. transversundatus (VR)

Nevesisporites sp. (R)

Cycadopites sp. cf. C. follicularis (R)

Verrucosisporites sp. (R)

Plankton:

Micrhystridium spp. (A)

Sample No: 79-EL-KM-10 at 02 m

C-82789

Age: Middle Triassic, probably Anisian

Environment of deposition: Marine

Remarks: Palynomorphs are very poorly preserved in this sapropel rich residue. The most common pollen species are Triadispora sp. and Striatoabieites sp. both of which are frequent forms in the Middle Triassic. Specimens of Alisporites minutisaccus (synonymous with Microcachryidites sittleri of Klaus 1964, and Geiger and Hopping 1968) which is typically found in the Upper Buntersandstein and Lower Muschelkalk of Europe indicates an Anisian age for the sample. Other forms which are usually found in this horizon are Infernopollenites cf. parvus, "Lueckisporites" sp. aff. triassicus and possible representatives of Perotriletes and Spinotriletes echinoides. The lack of Ovalipollis favors an Anisian rather than a Ladinian age. The acritarchs belong chiefly to the genera Filisphaeridium and Micrhystridium.

KRIEGER MOUNTAINS cont'd

Microfloral list: Spores and pollen:

- Triadispora sp. (C)
Striatoabieites aytugii (C)
Protohaploxylinus sp. (R)
cf. Spinotriletes echinoides (Madler) (R)
Lunatisporites noviaulensis (R)
Infernopollenites sp. cf. parvus (R)
Chordasporites sp. (R)
"Lueckisporites" aff. triassicus (R)
Alisporites sp. (R)
cf. Granosaccus sp. (VR)
cf. Podosporites sp. (R)
Lundbladispota sp. (R)
Cyclogranisporites sp. (C)
Camerozonosporites sp. (R)
Alisporites minutisaccus (Clarke 1965) (R)
? Perotrilites sp. (VR)

Plankton:

- Filisphaeridium sp. (C)
Micrhystridium sp. (C)
Veryhachium valensii (R)

Sample No: 79-EL-KM-11A

C-82790

Age: Indeterminable

Environment of deposition: Marine

Remarks: The small quantity of organic residue consists chiefly of sapropel.

Pollen, spores, and acritarchs are rare. The only form which can be identified

KRIEGER MOUNTAINS cont'd

to a specific level is Striatoabieites aytugii which ranges from the late Scythian to the late Karnian.

Microfloral list: Spores and pollen:

Striatoabieites aytugii (VR)

Pollen and spores indet. (R)

Plankton:

Michrhystridium spp. (R)

Sample No: 79-EL-KM-16

C-82794

Age: Karnian (Assemblage VII Fisher 1969)

Environment of deposition: Slight marine influence

Remarks: A diverse assemblage of thin, yellow, spores and pollen is present in this sample. A Karnian age is assigned based on the presence of specimens of Camerosporites sp., a diagnostic genus for this stage. Granosaccus ornatus, a form often recovered from the Arctic Karnian is also a rare component. A significant percentage of the assemblage consists of Striatoabieites aytugii, Brachysaccus sp. Ovalipollis ovalis and large non-taeniate pollen grains, but many other forms are present in smaller quantities. An unusual element is the common occurrence of possible fungal bodies. The marine element is minimal, consisting of rare acritarchs and even rarer, questionable dinoflagellates.

Microfloral list: Spores and pollen:

Striatoabieites aytugii (C)

S. sp. cf. S. balmei (R)

S. sp. (R)

Brachysaccus sp. (R)

Ovalipollis ovalis (R)

KRIEGER MOUNTAINS cont'd

Microfloral list: Spores and pollen (cont'd)

- Alisporites sp. (C)
- Chordasporites sp. (R)
- Rimaesporites sp. (R)
- Triadispora sp. (R)
- Granosaccus ornatus (R)
- Protohaploxypinus sp. (R)
- Aratrisporites sp. cf. fisheri (R)
- A. sp. (R)
- Trilete spores, long ranging (C)
- Polycingulatisporites sp. (R)
- Contignisporites sp. (R)
- Camerosporites sp. (R)
- Krauselisporites sp. (R)
- cf. Paracirculina sp. (R)
- cf. Triancoraesporites sp. (VR)
- cf. Taurocusporites sp. (VR)

Plankton:

- Micrhystridium sp. (R)
- Possible dinoflagellates (R)

Other fossils:

- ? Fungal body (C)

Reworking:

- Palaeozoic spores (R)

KRIEGER MOUNTAINS cont'd

Sample No: 79-EL-KM-19A

C-82798

Age: Late Karnian - early Norian

Environment of deposition: Marine

Remarks: This rich and diverse assemblage is composed of abundant yellow-brown pollen and spores and numerous dinoflagellates interspersed amongst large fragments of plant tissue. Large bisaccate pollen grains are particularly noticeable.

The abundant representatives of dinoflagellate genera recorded by Bujak and Fisher (1976) from the Arctic Norian and possibly late Karnian (Tan unpub. thesis) indicate a similar age for this sample. Specimens of Sverdrupiella dominate but the genera Hebecysta, Hiebergella and Noricysta form a significant element. The non-marine element contains a strong late Karnian influence in the form of Granosaccus cf. ornatus, Brachysaccus sp., tetrads of Paracirculina scurrilis and a possible Camerosporites sp. Ovalipollis ovalis is also present in significant numbers. It is however the large pollen grains belonging to genera such as Alisporites and Sulcatisporites which dominate visually. The absence of many typical Rhaeto-Norian forms probably indicates a late Karnian or early Norian age for the assemblage. It is unusual to find Stereisporites cicatricosus in an assemblage of this age. It occurs commonly in early Liassic strata although Fisher, 1979, records it from the Rhaetian of the Sverdrup Basin. The consensus favours a late Rhaetian age for the earliest appearance of this taxon. Although an earlier appearance cannot be ruled out, its presence here may be the result of contamination. Similarly, rare specimens resembling Comparodinium, a genus recorded by Morbey (1975) from the Rhaetian of the Kendelbachgraben may be contamination. This form is recorded in two other samples in this report,

KRIEGER MOUNTAINS cont'd

i.e. Gilman River 79-EL-16, 13 at 157 m and sample 14 at 162 m.

Microfloral list: Spores and pollen:

- Alisporites radialis (R)
- A. spp. (C)
- Ovalipollis ovalis (R)
- Granosaccus cf. ornatus (C)
- cf. Samaropollenites sp. (R)
- Podosporites sp. (R)
- ? Triadispora sp. (R)
- cf. Staurosaccites sp. (R)
- Brachysaccus sp. (R)
- Sulcatisporites sp. (C)
- Striatoabieites sp. (R)
- Aratrisporites sp. cf. A. fischeri (R)
- Paracirculina scurrilis (tetrads) (R)
- Iraquispora sp. cf. laevigata (R)
- Perinosporites sp. cf. P. Thuringiacus (R)
- Chasmatosporites sp. (R)
- cf. Annulispora sp. (VR)
- cf. Camerosporites sp. (VR)
- ? Corollina sp. (R)
- Anaemiidites spinulosus (R)
- Stereisporites cicatricosus (VR)
- Megaspores (R)

KRIEGER MOUNTAINS cont'd

Microfloral list (cont'd)

Plankton:

Sverdrupiella cf. mutabilis (A)

S. raiaformis (R)

Heibergella assymetrica (R)

Hebecysta sp. (R)

Noricysta varivallata (R)

N. fimbriata (R)

cf. Suessia sp. (R)

? Rhaetogonyaulax sp. (R)

cf. Comparodinium sp. (R)

Dinoflagellates indet. (C)

Other fossils:

Fungal body (R)

Cyst indet. (R)

Scolecodont (VR)

Foraminiferal test (C)

Tytthodiscus sp. (VR)

LAKE HAGAN CLIFFS

Sample No: 79-EL-13 at 0 m

C-85301

Age: Late Scythian, probably late Spathian

Environment of deposition: Marine

Remarks: This assemblage contains Scythian taeniate pollen belonging chiefly to the genera Lunatisporites and less frequently Protohaploxylinus. The presence of Striatoabieites balmei in small numbers indicates a late Scythian age. Rare specimens resembling Minutosaccus potonieii, which is an Anisian marker species in Europe together with possible Tasmanites specimens indicates a Middle Triassic influence. The sample is therefore probably late Spathian in age. The marine fraction consists of abundant specimens of Micrhystridium spp. and a considerable number of Veryhachium reductum.

Microfloral list: Spores and pollen:

Lunatisporites sp. (C)

L. novimundi (R)

L. transversundatus (R)

L. hexagonalis (VR)

Minutosaccus sp. cf. M. potonieii (R)

L. noviaulensis (C)

? Triadispora sp. (VR)

Alisporites sp. (VR)

Protohaploxylinus sp. (R)

? Corrisaccites sp. (VR)

Striatoabieites balmei (R)

Polypodiisporites sp. (R)

Polycingulatisporites sp. (R)

Lundbladisporea sp. (R)

Long ranging spores (C)

LAKE HAGAN CLIFFS cont'd

Microfloral list (cont'd)

Plankton:

Microhystridium spp. (A)

Veryhachium valensii var. reductum (C)

V. sp. (R)

Leiofusa jurassica (VR)

Other fossils:

? Tasmanites sp. (R)

Reworking:

Palaeozoic spores (R)

McKINLEY BAY

The majority of the samples from the Blind Fiord Formation yielded either very carbonised spores and plant debris (13 m, 25 m, 32 m, 125.5 m, 196 m, 290 m, 327 m, 344 m and 360 m) or they contained little organic residue and were effectively barren (19 m, 26.5 m, 87 m). However, one sample from 67 m contains a well preserved and quite diverse microfloral assemblage.

All the productive samples yielded grossly similar assemblages of early Triassic age with taeniate pollen belonging to the genera Lunatisporites and Protohaploxypinus occurring consistently.

McKINLEY BAY cont'd

Samples No: 79-EL-31 at 13 m, 19 m, 25 m, 26.5m and 32 m

C-82182, 82183, 82184, 82185, 82186

Age: Griesbachian

Environment of deposition: Non-marine at first, then slight marine influence in higher samples.

Remarks: Samples from 13 m up to and including 32 m are assigned a Griesbachian age based on the occurrence of common specimens of Foveofusa in the highest sample. This species is limited to the Griesbachian in the Sverdrup Basin (Staplin, in press). Pollen such as Lunatisporites novimundi, L. hexagonalis, Protohaploxylinus jacobii and P. samoilovichii form the bulk of the assemblages but Equisetosporites steevesi and forms resembling E. multistriatus do occur in small numbers (in 25 m, 32 m). The latter are also characteristic of early Scythian sediments in Arctic Canada. This lower part of the section contains no evidence of marine influence in the oldest sample (13 m) but occasional acritarchs (Microhystridium sp. and Leiofusa jurassica) are present in the younger samples (25 m and 32 m) suggesting a marine environment of deposition.

Microfloral lists:

13 m. Spores and pollen:

Lunatisporites sp. (fragments) (R)

Protohaploxylinus samoilovichii (VR)

Spores indet. (R)

19 m. Spores indet. (R)

McKINLEY BAY cont'd

Microfloral lists:

- 25 m. Spores and pollen:
- Lunatisporites sp. (Fragments) (C)
 - L. hexagonalis (R)
 - Equisetosporites steevesi (R)
 - E. sp. cf. E. multistriatus (R)
 - Protohaploxylinus sp. (R)
 - Cycadopites sp. (R)
- Plankton:
- Micrhystridium sp. (R)
- 26.5 m. Barren
- 32 m. Spores and pollen:
- Lunatisporites spp. (fragments) (A)
 - L. hexagonalis (R)
 - L. novimundi (R)
 - Protohaploxylinus samoilovichii (C)
 - P. jacobii (R)
 - Equisetosporites steevesi (R)
 - E. sp. cf. E. steevesi (R)
 - Cycadopites sp. cf. C. minimus (R)
 - cf. Striatoabietites sp. (VR)
 - Apiculatisporites sp. (R)
- Plankton:
- Micrhystridium sp. (R)
 - Leofusa jurassica (VR)
- Uncertain:
- Foveofusa sp. (C)

McKINLEY BAY cont'd

Sample No: 79-EL-23 at 67 m

C-85577

Age: Early Smithian (Assemblage 3, Fisher, 1979)

Environment of deposition: Marine

Remarks: Palynomorphs are abundant, well preserved and belong to quite a number of taxa. The most numerous forms are the taeniate pollen, Lunatisporites novimundi, L. samoilovichii, L. hexagonalis, L. cf. L. pellucidus and the trilete spore genera Densoisporites, Lundbladispota and Kraeuselisporites. This latter group typically becomes common in the Dienerian of the Arctic (Fisher 1979). Densoisporites cf. D. playfordi, Lundbladispota sp. cf. L. brevicula, Kraeuselisporites apiculatus as well as other unidentified forms in these genera occur frequently in this sample. Equisetosporites steevesi and E. sp. cf. E. multistriatus are also common as they are in the underlying samples. It is, however, the presence of one specimen of Aratrisporites sp. which suggests a Smithian age. Representatives of this genus first appear in Fisher's Assemblage 3 which is of presumed Smithian age. A fairly rich association of acritarchs including Veryhachium spp. and Michrhystridium spp. indicate a marine environment of deposition.

Microfloral list: Spores and pollen:

Lunatisporites novimundi (A)

L. samoilovichii (A)

L. hexagonalis (C)

L. cf. pellucidus (C)

Protohaploxylinus jacobii (R)

Densoisporites playfordi (A)

Lundbladispota sp. cf. L. brevicula (R)

McKINLEY BAY cont'd

Microfloral list: Spores and pollen (cont'd)

L. sp. (R)

Kraeuselisporites apiculatus (R)

K. sp. (R)

Aculeisporites variabilis (R)

Inaperturopollenites sp. (R)

Verrucosisporites sp. (R)

Aratrisporites sp. (R)

Equisetosporites steevesi (C)

Platysaccus sp. (VR)

E. cf. multistriatus (R)

Plankton:

Micrhystridium sp. cf. balmei (C)

M. spp. (C)

Veryhachium valensii (C)

V. reductum (R)

Leiofusa jurassica (R)

Incertae sedis:

? Fungal spores, clump (R)

Sample No: 79-EL-23 at 87 m

C-85578

Age: Scythian, Smithian by inference

Environment of deposition: Indeterminable

Remarks: A few possible sporomorphs are present but the preservation precludes identification.

McKINLEY BAY cont'd

Sample No: 79-EL-23 at 125.5 m

C-85582

Age: Smithian

Environment of deposition: Marine

Remarks: This assemblage, although strongly carbonised, is grossly similar in content to the sample from 67 m. However, the Densoisporites-Lundbladispora-Krauselisporites element is even more strongly represented and the taeniate pollen grains are less abundant. This association is typical of the Dienerian. The genus Aratrisporites is not present here but it occurs at 67 m and a Smithian age is therefore assigned to the sample. Micrhystridium species are again common here but Veryhachium is infrequent.

Microfloral list:

125.5 m. Spores and pollen:

Lunatisporites novimundi (C)

L. sp. (R)

L. samoilovichii (R)

Densoisporites cf. playfordi (C)

Krauselisporites sp. (R)

Lundbladispora sp. (R)

Cycadopites minimus (C)

Platysaccus sp. (VR)

Equisetosporites steevesi (R)

Plankton:

Micrhystridium spp. (C)

Veryhachium valensii (R)

V. valensii var. reductum (R)

McKINLEY BAY cont'd

Sample No: 79-EL-23 at 196 m

C-85583

Age: Smithian

Environment of deposition: Marine

Remarks: Palynomorphs are abundant, very poorly preserved, dark brown in colour and often unidentifiable. The genera Densoisporites and Lundbladispota form a significant percentage of the assemblage. These are associated with taeniate and non-taeniate pollen and very abundant representatives of the acritarch genus Micrhystridium. A single specimen of a large acritarch resembling Veryhachium ellesmerense (Staplin in press) is present. Staplin records this species from the Smithian of the Sverdrup Basin. Other forms present, not observed in underlying samples, include cf. Chordasporites sp., ? Triadispora sp. and Alisporites sp.

Microfloral list:

196 m.

Spores and pollen:

Lundbladispota sp. (C)

Densoisporites sp. (R)

Kraeuselisporites sp. (R)

Aculeisporites variabilis (R)

Lunatisporites samoilovichii (R)

L. spp. indet. (R)

? Triadispora sp. (VR)

Alisporites sp. (R)

Pollen indet. (R)

cf. Chordasporites sp. (VR)

McKINLEY BAY cont'd

Microfloral list (cont'd)

196 m. Plankton:

Micrhystridium spp. (A)

Veryhachium valensii (R)

V. cf. V. ellesmerense (VR)

Sample No: 79-EL-23 at 290 m

C-85585

Age: Smithian (Assemblage 3, Fisher 1979)

Environment of deposition: Marine

Remarks: Spores and pollen are again abundant but poorly preserved. The most frequent forms are pollen belonging to the genus Lunatisporites and abundant acritarchs. A distinctive species not recorded from older samples in the McKinley Bay section is Nevesisporites limatulus. Both Dolby and Balme, 1976, and Fisher 1979 record the first occurrence of this taxon in Smithian strata.

Microfloral list: Spores and pollen:

Lunatisporites novimundi (C)

L. hexagonalis (C)

L. spp. indet. (R)

L. samoilovichii (VR)

Lundbladispora sp. (R)

Kraeuselisporites cf. apiculatus (R)

Nevesisporites limatulus (VR)

Cycadopites minimus (C)

Apiculatispora sp. (R)

Plankton:

Micrhystridium spp. (A)

Veryhachium valensii (VR)

McKINLEY BAY cont'd

Sample No: 79-EL-23 at 327 m

C-85586

Age: Late Scythian, undifferentiated

Environment of deposition: Marine

Remarks: Although the preservation is very poor in this sample, it is possible to recognise pollen belonging to the genus Lunatisporites and a few other morphotypes. Acritarchs are abundant as in several underlying samples. The assemblage is depleted but obviously Scythian in character. A late Scythian age is assigned by inference from the underlying sample.

Microfloral list: Spores and pollen:

Lunatisporites sp. indet. (C)

L. hexagonalis (R)

L. novimundi (R)

cf. Equisetosporites sp. (VR)

Cycadopites minimus (R)

Densoisporites sp. (R)

Plankton:

Micrhystridium spp. (A)

Veryhachium valensii (VR)

Samples No: 79-EL-23 at 344 m and 360 m

C-85587 and C-85588

Age: Late Scythian, undifferentiated

Environment of deposition: Marine

Remarks: Both samples are very poorly preserved with the younger one containing a larger percentage of unrecognisable debris. Lunatisporites species are present in both assemblages together with abundant acritarchs belonging to the genus Micrhystridium.

McKINLEY BAY cont'd

Microfloral lists:

344 m.

Spores and pollen:

Lunatisporites novimundi (R)

L. spp. (fragments) (R)

Spores indet. (R)

Plankton:

Micrhystridium spp. (A)

Veryhachium valensii (VR)

360 m.

Spores and pollen:

Lunatisporites novimundi (R)

L. spp. (fragments and indet.) (C)

Sporomorphs indet. (C)

Plankton:

Micrhystridium spp. (A)

NUNATAK

Sample: 79-EL-21 at 30 m

C-85590

Age: Scythian, probably Griesbachian-Dienerian

Environment of deposition: Non-marine

Remarks: Spores and pollen are poorly preserved and often fragmented in this sample from the Blind Fiord Formation. The assemblage is dominated by taeniate bisaccates typical of the Scythian. The presence of a single specimen of Equisetosporites sp. cf. E. steevesi indicates a probable early Scythian age.

NUNATAK cont'd

Microfloral list: Spores and pollen:

Lunatisporites samoilovichii (R)

L. hexagonalis (C)

L. sp. cf. L. transversundatus (VR)

L. spp. (fragments) (A)

Protohaploxylinus jacobii (R)

Equisetosporites sp. cf. steevesi (VR)

Cycadopites sp. (R)

Apiculatisporites sp. (R)

Samples: 79-EL-21 at 87 m and 104 m

C-85563 and C-85564

Age: Indeterminable

Environment of deposition: Slight marine influence

Remarks: These two samples from the Blind Fiord Formation are similar in their low microfloral yield and their large quantity of pale yellow plant debris. Both contain rare thin folded bodies, verrucate spores and possible fungal spores. A single foraminiferal test occurs in the lower sample indicating some marine influence. There are no diagnostic species present.

Microfloral lists:

87 m. Spores and pollen:

Spores indet. (R)

Fungal spore (VR)

cf. Verrucosisporites sp. (R)

Other fossils:

Foraminiferal test (VR)

Cuticle (VR)

NUNATAK cont'd

Microfloral lists (cont'd)

104 m. Spores and pollen:
 Folded bodies (R)
 cf. Verrucosisporites sp. (R)
 Fungal spore (VR)
 Other fossils:
 Cuticle (VR)

Samples: 79-EL-21 at 135, 156, 174, 381, 400 and 549 m
 C-85565, 85566, 85567, 85568, 85569, and 85574

Age: Indeterminable

Environments of deposition: Indeterminable, except 174 m which is marine.

Remarks: These samples yielded very little residue. The rare sporomorphs present could not be identified due to the high level of carbonisation. Only the sample from 174 metres contained abundant, but often barely recognisable, representatives of the genus Micrhystridium.

Microfloral lists:

135 m. Barren
156 m. ? Sporomorphs (R)
174 m. Sporomorphs (R)
 Micrhystridium spp. (A)
381 m. Barren
400 m & 549 m. ? Sporomorphs (R)

RED ROCK RIDGE

Sample No: 79-EL-20

C-85546

Age: Indeterminable

Environment of deposition: Indeterminable

Remarks: This sample from the Blind Fiord Formation contains very little residue all of which is highly carbonised. Verrucate bodies of unknown affinity are quite abundant.

Microfloral list: Verrucate bodies (A)