32. # SUBSURFACE STRATIGRAPHY AND CONODONT ZONATION OF THE LOWER PALEOZOIC SUCCESSION, ARCTIC PLATFORM, SOUTHERN ARCTIC ARCHIPELAGO

Projects 750017, 680101 and 500029

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Mayr, Ulrich, Uyeno, T.T., Tipnis, R.S., and Barnes, C.R.; Subsurface Stratigraphy and Conodont Zonation of the Lower Paleozoic Succession, Arctic Platform, Southern Arctic Archipelago; in Current Research, Part A, Geological Survey of Canada, Paper 80-1A, p. 209-215, 1980.

Abstract

*Lower Paleozoic strata of the Arctic Platform penetrated by four wells located in the southern part of the Arctic Archipelago (Murphy Alminex Victoria Island F-36 on northwestern Victoria Island; Sun Panarctic Russell E-82 on Russell Island; KMG Decalta Young Bay F-62 on east-central Prince of Wales Island; and Panarctic Deminex Garnier 0-21 on northeastern Somerset Island), range in age from Middle Cambrian to Early Devonian. For ease in discussion, the formations included in this study are grouped into four sequences (in ascending order): 1) pre-Allen Bay (conodonts ranging from late Tremadocian, Fauna C of Ethington and Clark, 1971, to Late Ordovician in age); 2) Allen Bay and Cape Storm formations (late Llandoverian, **celloni** Zone, to Ludlovian); 3) Read Bay - Drake Bay - Peel Sound complex (Ludlovian, **ploeckensis** Zone, to Pragian, **sulcatus** Zone); and 4) Eids Formation (Zlichovian-Dalejan, **inversus** Zone). A major unconformity is present below the Allen Bay Formation.*

Introduction

The present report correlates the stratigraphical sequences of four wells that penetrate the lower Paleozoic succession of the Arctic Platform. The wells, which are located on northwestern Victoria Island, Russell Island, east-central Prince of Wales Island, and northeastern Somerset Island, are:

1) Murphy Alminex Victoria Island F-36 (72°45'18"N, 117°11'13"W);
2) Sun Panarctic Russell E-82 (73°51'29"N, 98°56'49"W);
3) KMG Decalta Young Bay F-62 (72°41'23"N, 96°49'34"W); and
4) Panarctic Deminex Garnier 0-21 (73°40'52"N, 90°36'45"W).

The geographic locations of these wells are shown on Figure 32.1. The stratigraphy of two of these wells, Russell E-82 and Garnier 0-21, has been described earlier (Mayr, 1978) and some alternate nomenclature and revision of the earlier stratigraphic scheme are proposed here. Discussion of correlation is by Mayr, and biostratigraphic studies of Siluro-Devonian conodonts are by Uyeno, and of Ordovician conodonts by Tipnis and Barnes.

Stratigraphy and Conodont Biostratigraphy

The Phanerozoic succession encountered in the wells ranges in age from Cambrian to Devonian (Fig. 32.1, Table 32.1), and some of the more biostratigraphically significant conodonts from this succession are illustrated on Plate 32.1. For convenience of discussion the succession is divided into four stratigraphic sequences. The lowermost sequence of this succession consists of Cambrian and Ordovician formations which are overlain disconformably by the Allen Bay Formation. The second sequence, of latest Ordovician to Late Silurian age, contains the Allen Bay and Cape Storm formations. It is overlain gradationally by the Read Bay-Drake Bay-Peel Sound complex of formations, which, in contrast to the uniform lithologies of the underlying strata, exhibit intricate facies changes. The formations of this sequence are of Late Silurian and Early Devonian age. The uppermost sequence is represented by the Lower Devonian Eids Formation which overlies disconformably the Read Bay Formation.

Pre-Allen Bay Sequence

This sequence consists of massive, pure carbonate rocks deposited in a normal marine, subtidal environment alternating with carbonate rocks that contain relatively large amounts of terrigenous material and were deposited in a restricted, highly saline environment. The Cape Clay, Eleanor River, Thumb Mountain and Irene Bay formations belong to the first group, whereas the Cass Fjord Formation, the unnamed carbonates and the Bay Fiord Formation comprise the second group of restricted origin. The Garnier well allows the comparison of the various sets of stratigraphic nomenclature. Previously, the nomenclature derived from the Franklinian Geosyncline and from Baffin Island were used to designate the formations (Mayr, 1978). In the present work, nomenclature from the edge of the Arctic Platform, as used by Christie (1967, 1977), is applied.

The position of the lower boundary of the Cape Clay Formation in the Young Bay well is tentative. It may be picked higher, at 1185.7 m (3890 ft) rather than at 1246.3 m (4089 ft), as depicted on Figure 32.1. The lower position is preferable because this allows the placement of sandy carbonates within the upper, rather than middle, part of the Cass Fjord Formation; comparable sandy carbonates are known to occur in similar stratigraphic position on Devon Island (Christie, 1977). Equally tentative is the lower boundary of the Cass Fjord Formation. In the present study the formation has been extended to the base of the Phanerozoic succession and lies unconformably on the Precambrian Aston Formation. The dolomite below the 1291.1 m (4236 ft) level, however, may be correlative with the lower part of the Bear Point Formation on eastern Devon Island.

The unnamed Ordovician carbonate strata are nonevaporitic equivalents of the Baumann Fiord Formation, and were incorrectly correlated with the Eleanor River Formation by Mayr (1978).

The contact between the Thumb Mountain and Bay Fiord formations is disconformable. This possibility was suggested earlier by Mayr (1978) and subsequent field work on Devon Island (Mayr and Thorsteinsson, unpublished information) confirmed the existence of a disconformity between the Thumb Mountain and Bay Fiord formations on the eastern part of the island.

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Table 32.1

Stratigraphic nomenclature and ages of the lower Paleozoic succession of the Arctic Platform encountered in four wells.

Age			Murphy Alminex et al. Victoria Isl. F-36	Sun Panarctic Russell E-82	KMG Decalta Young Bay F-62	Panarctic Deminex Garnier O-21
Devonian	Early	Dalejan	Eids (part)			
		Zlichovian				
		Pragian		Drake Bay	upper mbr.	Peel Sound
		Lochkovian			lower mbr.	
Silurian	Late	Pridolian	Read Bay C ?			Read Bay (undivided)
		Ludlovian	B ?	Read Bay B		
			A	A		
	Mid.	Wenlockian	Cape Storm	Cape Storm	Cape Storm	Cape Storm
	E.	Llandoverian	Allen Bay	Allen Bay	Allen Bay	Allen Bay
Ordovician	Late	Ashgillian				Irene Bay
	Middle	Caradocian				Thumb Mountain
		Llandeilian	Bay Fiord			Bay Fiord
		Llanvirnian				Eleanor River
	Early	Arenigian			unnamed carbonates	unnamed carbonates
		Tremadocian			Cape Clay	Cape Clay
Cambrian	L.				Cass Fjord (may include lower Bear Point Fmn.)	Cass Fjord
	Mid.					
	E.					
Precambrian					Aston (part)	

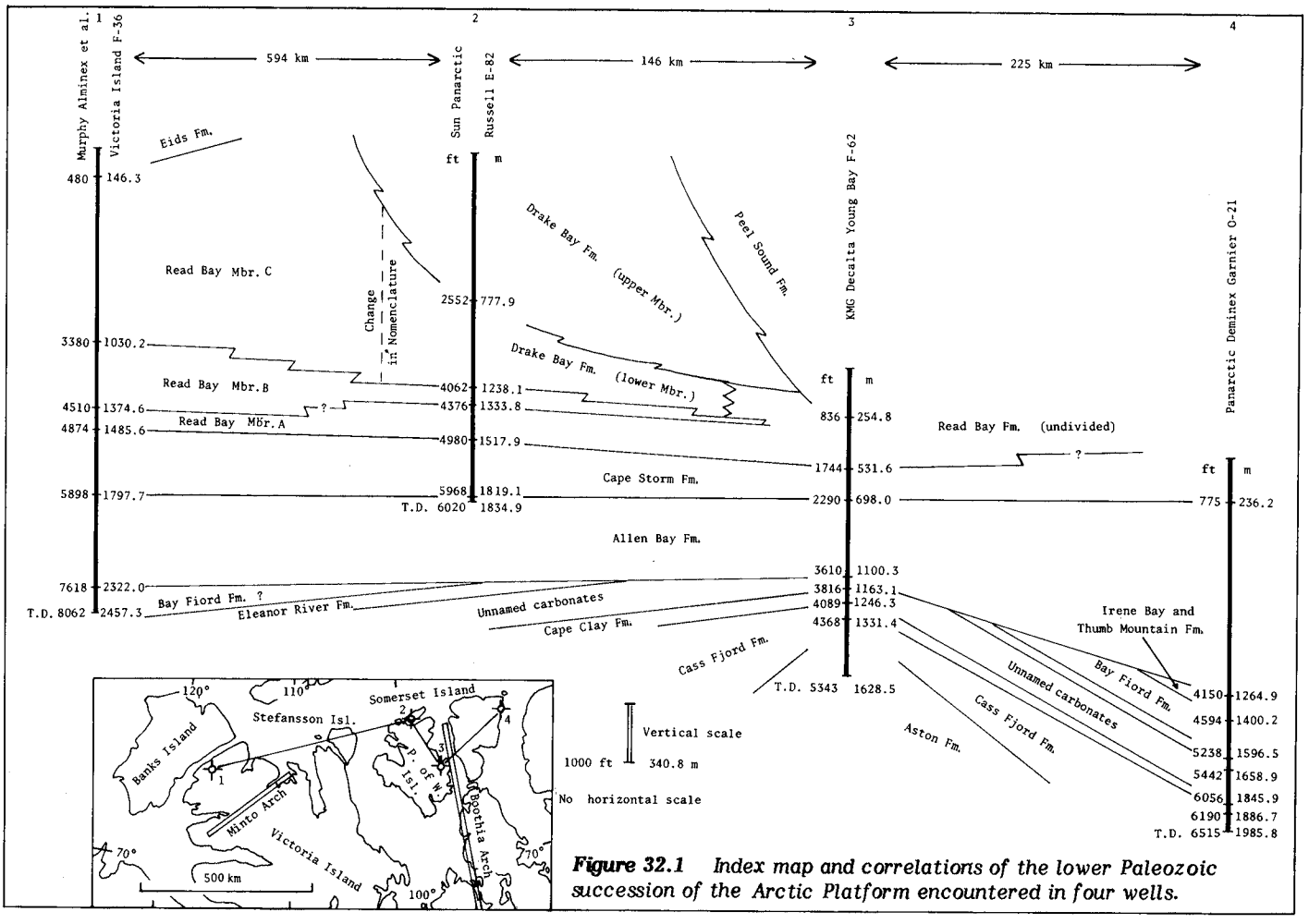


Figure 32.1 *Index map and correlations of the lower Paleozoic succession of the Arctic Platform encountered in four wells.*

Correlation of the rocks underlying the Allen Bay Formation in the Victoria Island well is uncertain; they contain anhydrite and shale, and thus belong to one of the formations of restricted origin. Sandy strata, which are characteristic of the Cass Fjord Formation and the unnamed carbonate rocks in the east, were not reported and consequently the Victoria Island strata are tentatively assigned to the Bay Fiord Formation.

The oldest conodont fauna in this study was derived from the Cape Clay Formation, in the interval 1847.1-1865.4 m (6060-6120 ft) of the Garnier well. The fauna includes the new genus of Repetski and Ethington (1977), and **"Acontiodus"** cf. **"A." staufferi** Furnish. The new genus, as presently understood, is known to be restricted to Fauna C of Ethington and Clark (1971). Fauna C, of late Tremadocian age, has also been found in the uppermost Copes Bay Formation on Grinnell Peninsula on Devon Island.

The overlying unnamed carbonates yielded conodonts in the interval 1127.8-1158.2 m (3700-3800 ft) of the Young Bay well. Among the conodonts are **"Acodus" oneotensis** Furnish, A. cf. **A. brevis** Branson and Mehl sensu Lindström (in Ziegler, 1977), **"Drepanodus" parallelus** Branson and Mehl, **"Scolopodus" gracilis** Ethington and Clark, and cf. **"S." quadraplicatus** Branson and Mehl. **"Acodus" brevis** and **"Scolopodus" quadraplicatus** are common constituents of Fauna D of Ethington and Clark (1971). This fact, together with the general affinites of the accompanying conodonts, suggests a post-Tremadocian Early Ordovician age (i.e., late, but not latest, Canadian). Elements similar to **"Acodus" oneotensis** are known to occur in post-Tremadocian age rocks (Lindström in Ziegler, 1977, p. 429-431).

A single sample from the Bay Fiord Formation, in the interval 2435.4-2450.6 m (7990-8040 ft) of the Victoria Island well failed to yield any conodonts.

The interval 1396.6-1400.3 m (4582-4592 ft) in the Garnier well contained, among other species, **Appalachignathus delicatulus** Bergström et al., **Belodella** n. sp. and **Polyplacognathus ramosus** Stauffer. Both the belodelliform and oistodiform elements of **Belodella** n. sp. are close to, but probably not identical with, those of **Belodella jemtlandica** Löfgren (Löfgren, 1978). The age of the fauna is late Chazy to mid-Barneveld (early Caradocian), representing Faunas 6-7 of Sweet et al. (1971).

The youngest collection from the pre-Allen Bay sequence was obtained from an interval regarded as ranging from Irene Bay Formation to the lowermost part of the Allen Bay Formation. This occurs in the Garnier well, in the interval 1249.7-1280.2 m (4100-4200 ft), and the fauna consists of **Panderodus** cf. P. **panderi** (Stauffer). The probable age of the interval is late Middle to Late Ordovician.

Allen Bay and Cape Storm Formations

The Ordovician formations discussed are overlain disconformably by Late Ordovician-Early Silurian age dolomites of the Allen Bay Formation. The existence of an unconformity at the base of the Allen Bay Formation has been demonstrated on the east side of the Boothia Arch by Miall and Kerr (in press). In the Victoria Island, Russell, and Young Bay wells the contact between the Allen Bay Formation and overlying silty dolomites of the Cape Storm Formation is sharp and probably disconformable. If this interpretation is correct, the nature of the contact could reflect the first pulse of the Cornwallis Disturbance (Kerr, 1977). In the Garnier well the contact is gradational.

The Allen Bay Formation was sampled at eight intervals in three wells: Victoria Island, Young Bay and Garnier. Of these intervals, only two, both from the Garnier well, yielded conodonts other than **Panderodus** spp. The first is interval 664.5-670.6 m (2180-2200 ft) with a peculiar greilingiform element that is closely similar to the Sb element of **Ozarkodina plana** (Walliser). The second is from 295.7-313.9 m (970-1030 ft), that yielded a slightly asymmetrical trichonodelliform element similar to the Sa element of **Oulodus jeannae** Schönlaub. Both taxa were previously reported from the Western Karawanken Alps in Austria, where they occur in the **celloni** Zone of Llandovery age (Sweet and Schönlaub, 1975, p. 49-53).

The overlying Cape Storm Formation was sampled at four intervals in three wells: Garnier, Young Bay and Victoria Island. The interval 73.2-82.3 m (240-270 ft) in the Garnier well did not yield any conodonts. The collection from the interval 566.9-597.4 m (1860-1960 ft) of the Young Bay well includes **Ozarkodina** n. sp. B of Klapper and Murphy (1975) and Apparatus B of Uyeno (in press). Both have been found previously in the Douro Formation and its lateral equivalent, member A of the Read Bay Formation, with the former occurring on Cornwallis and Prince of Wales islands, and Boothia Peninsula, and the latter on Boothia Peninsula only (Uyeno, 1977, in press). These conodonts are assignable to the **siluricus** Zone of Ludlovian age.

The Cape Storm Formation was sampled in the intervals 1630.7-1661.2 m (5350-5450 ft) and 1524.0-1554.5 m (5000-5100 ft) of the Victoria Island well. The lower interval yielded a single fragmentary Pa element that can be referred to only as **Ozarkodina** cf. **O. confluens** (Branson and Mehl). The fauna from the higher interval includes **O. confluens** gamma morphotype of Klapper and Murphy (1975), and the peculiar spathognathodontan element that has been referred previously to **O.** cf. **O.** n. sp. B of Klapper and Murphy (1975). Its known occurrences are the upper part of the Cape Storm Formation at Goodsir Creek, eastern Cornwallis Island (Uyeno, 1977) and near the top of the Allen Bay/Read Bay carbonate unit in the Panarctic ARCO et al. Blue Fiord E46 well on Bjorne Peninsula, Ellesmere Island (Mayr et al., 1978). The age of the fauna from the higher interval is regarded as Ludlovian.

Read Bay-Drake Bay-Peel Sound Complex

The lithology of these partly correlative formations documents the rise of the Boothia Arch during Late Silurian and Early Devonian time. The formations grade from the offshore marine carbonates of member C of the Read Bay Formation, through the nearshore carbonates of the upper member of the Drake Bay Formation, into the nonmarine sandstones of the Peel Sound Formation. The dolomite of the lower member of the Drake Bay Formation is similar to that of the Read Bay member C in the Victoria Island well and the separation of the two units is a matter of stratigraphic convenience, as indicated by a vertical dashed line of Figure 32.1. Mayr (1978) assigned the interval 1238.1-1333.8 m (4062-4376 ft) in the Russell well to member A of the Read Bay Formation, but recent field evidence from Devon Island (Mayr and Thorsteinsson, unpublished information) suggests that this unit in fact is correlative with member B. The three members of the Read Bay Formation in the Victoria Island well may be broadly correlative with units 11a, 11b and 11c of the Read Bay Group (Thorsteinsson and Tozer, 1962) on Stefansson Island. Member B thickens westward, but it is not known which parts of the carbonate units are replaced by shale.

PLATE 32.1

Figures 1-7, 9, 10 are x60, remainder are x50. All figures are lateral views unless otherwise noted. Refer to Figure 32.1 for stratigraphic assignment.

Figures 1, 2, 5, 7, 8, 16-24, 27, 36, 40, 43, 46-48. From the KMG Decalta Young Bay F-62 well, east-central Prince of Wales Island, GSC loc. C-83486.

Figure 1. **"Drepanodus" parallelus** Branson and Mehl. GSC 62966 (1127.8-1158.2 m, 3700-3800 ft).

Figure 2. **"Scolopodus" gracilis** Ethington and Clark. GSC 62967 (1127.8-1158.2 m, 3700-3800 ft).

Figure 5. **"Acodus" oneotensis** Furnish. GSC 62968 (1127.8-1158.2 m, 3700-3800 ft).

Figure 7. cf. **"Scolopodus" quadraplicatus** Branson and Mehl. GSC 62969 (1127.8-1158.2 m, 3700-3800 ft).

Figures 8, 21, 27. Apparatus B of Uyeno (in press). 8, 21, GSC 62970 and 62971 (566.9-597.4 m, 1860-1960 ft); 27, GSC 62972 (487.7-518.2 m, 1600-1700 ft).

Figures 17-20. **Ozarkodina** n. sp. B of Klapper and Murphy (1975). Pa, M, Pb and Sa elements, GSC 62973-62976, respectively (566.9-597.4 m, 1860-1960 ft).

Figures 16, 22-24, 36. **Ozarkodina confluens** (Branson and Mehl). 16, 23, 24, Pa, Pb and Pa elements, GSC 62977-62979, respectively (487.7-518.2 m, 1600-1700 ft); 22, 36, Pb and Pa elements, GSC 62980 and 62981 (274.3-304.8 m, 900-1000 ft).

Figures 40, 46. **Ozarkodina?** sp. M and Pa elements, GSC 62982 and 62983 (182.9-213.4 m, 600-700 ft).

Figures 43, 47, 48. **Pelekysgnathus** n. sp. C of Uyeno (in press). I, M_2 and M_2 elements, GSC 62984-62986, respectively (182.9-213.4 m, 600-700 ft).

Figures 3, 4, 6, 9-14. From the Panarctic Deminex Garnier 0-21 well, north-eastern Somerset Island, GSC loc. C-30875.

Figures 3, 4. **Belodella** n. sp. Oistodiform and belodelliform elements, GSC 62987 and 62988, respectively (1396.6-1400.3 m, 4582-4594 ft).

Figure 6. New genus of Repetski and Ethington (1977). GSC 62989 (1396.6-1400.3 m, 4582-4594 ft).

Figure 10. **Polyplacognathus ramosus** Stauffer. Upper view of amorphognathiform element, GSC 62991 (1396.6-1400.3 m, 4582-4594 ft).

Figure 11, 12. **Panderodus** cf. **P. panderi** (Stauffer). GSC 62992 and 62993 (1249.7-1280.2 m, 4100-4200 ft).

Figure 13. **?Ozarkodina plana** (Walliser). Sb element, GSC 62994 (664.5-670.6 m, 2180-2200 ft).

Figure 14. **?Oulodus jeannae** Schönlaub. Sa element, GSC 62995 (295.7-313.9 m, 970-1030 ft).

Figures 15, 25, 26, 28, 29, 38, 41, 42. From the Murphy Alminex Victoria Island F-36 well, northwestern Victoria Island, GSC loc. C-39595.

Figure 15, 25. **Ozarkodina confluens** (Branson and Mehl), gamma morphotype of Klapper and Murphy (1975). Pa elements, GSC 62996 and 62997 (1524.0-1554.5 m, 5000-5100 ft).

Figure 26. **Ozarkodina** cf. **O.** n. sp. B of Klapper and Murphy (1975). Pa element, GSC 62998 (1524.0-1554.5 m, 5000-5100 ft).

Figure 28. **Ozarkodina excavata excavata** (Branson and Mehl). Pa element. GSC 62999 (1402.1-1432.6 m, 4600-4700 ft).

Figure 29, 38. Cruciform element, GSC 63000 (1402.1-1432.6 m, 4600-4700 ft).

Figures 41, 42. **Ozarkodina confluens** (Branson and Mehl). Pa and Sb elements, GSC 63001 and 63002 (1402.1-1432.6 m, 4600-4700 ft).

Figures 30-32, 34, 37. From the Sun Panarctic Russell E-82 well, Russell Island, GSC loc. C-30870.

Figure 32. **Ozarkodina excavata excavata** (Branson and Mehl). Pa element, GSC 63003 (1402.1-1426.5 m, 4600-4680 ft).

Figure 34. Apparatus B of Uyeno (in press). GSC 63004 (1402.1-1426.5 m, 4600-4680 ft).

Figure 37. **Kockelella variabilis** Walliser. Pa element, GSC 63005 (1310.6-1328.9 m, 4300-4360 ft).

Figure 30. **Ozarkodina remscheidensis?** (Ziegler). Pa element, GSC 63006 (707.1-719.3 m, 2320-2360 ft).

Figure 31. **Ozarkodina remscheidensis remscheidensis** (Ziegler). Pa element, GSC 63007 (585.2-621.8 m, 1920-2040 ft).

Figures 33, 35, 39, 44, 45. From Drake Bay Formation, upper member, from an outcrop located about 10 km west of the Russell E-82 well site, Russell Island, GSC loc. C-82456.

Figures 33, 35. **Eognathodus sulcatus sulcatus** Philip. Upper and lateral views of two Pa elements, GSC 63008 and 63009.

Figure 39. **Pelekysgnathus** n. sp. C of Uyeno (in press). I element, GSC 63010.

Figures 44, 45. **Pandorinellina** sp. or **Ozarkodina** sp. Pa elements, GSC 63011 and 63012.

Figures 49-52. From Eids Formation, from an outcrop located about 24 km west-southwest of the Victoria Island F-36 well site, Victoria Island, GSC locs. C-30547 and C-30548.

Figure 49. ?**Pandorinellina expansa** Uyeno and Mason. Pb element, GSC 63013.

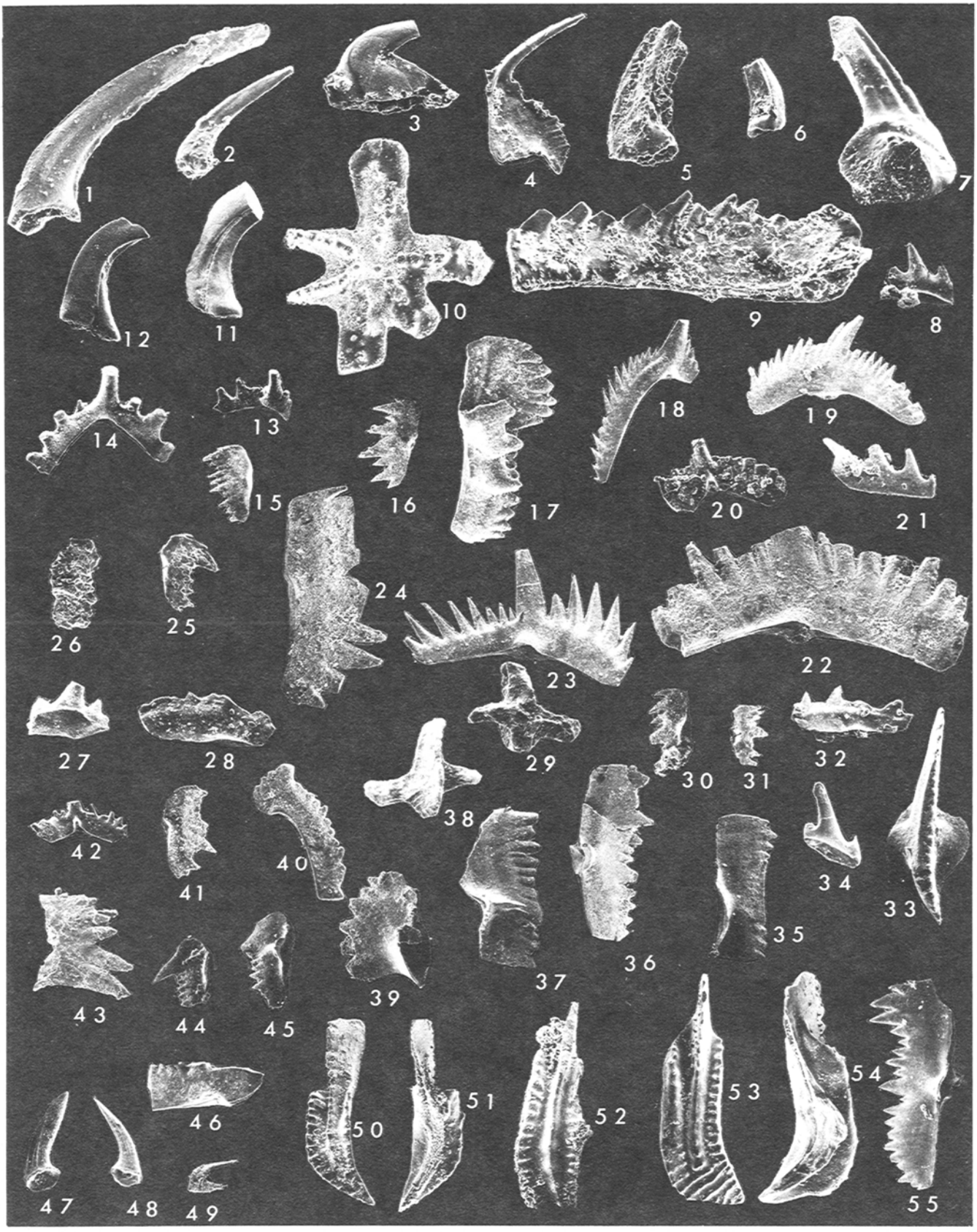
Figure 50, 51. **Polygnathus** sp. Upper and lower views of a Pa element, GSC 63014.

Figure 52. ?**Polygnathus costatus** Klapper. Upper view of a Pa element, GSC 63015.

Figures 53-55. From Blue Fiord Formation, from an outcrop on the larger of the Princess Royal Islands, located about 32 km west of the Victoria Island F-36 well site, Victoria Island, GSC locs. C 30544 and C-30545.

Figure 53, 54. **Polygnathus inversus** Klapper and Johnson. Upper and lower views of a Pa element, GSC 63016.

Figure 55. **Pandorinellina** sp. Pa element, GSC 63017.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The Read Bay Formation is divided in the Young Bay well, and was sampled for conodonts in three intervals: 487.7-518.2 m (1600-1700 ft), 347.5-378.0 m (1140-1240 ft) and 274.3-304.8 m (900-1000 ft). The lowermost of these intervals yielded **Ozarkodina confluens** and Apparatus B of Uyeno (in press); the middle, **Ozarkodina** n. sp. B; and the highest, **Pelekysgnathus** n. sp. C of Uyeno (in press) and O. **confluens** alpha morphotype of Klapper and Murphy (1975). As discussed previously in this paper, the age of the lowest and middle faunas can be regarded as Ludlovian, whereas the highest fauna may be as young as Pridolian. **Pelekysgnathus** n. sp. C has been found previously in the lower part of the Peel Sound Formation on eastern Prince of Wales Island (Uyeno, in press).

Conodonts of member A of the Read Bay Formation were obtained from the Victoria Island and Russell wells. In the latter, **Ozarkodina** n. sp. B was found in the interval 1432.6-1456.9 m (4700-4780 ft), **Ozarkodina excavata excavata** (Branson and Mehl), Apparatus B, and **Ancoradella ploeckensis** Walliser at 1402.1-1426.5 m (4600-4680 ft), and **Ozarkodina excavata** at 1380.7-1399.0 m (4530-4590 ft). The Ludlovian age of **O.** n. sp. B has been discussed previously. The presence of **A. ploeckensis**, below the first occurrence of **Polygnathoides siluricus** Branson and Mehl, indicates the **ploeckensis** Zone of mid-Ludlovian age. In the Victoria Island well, member A was sampled in the intervals 1402.1-1432.6 m (4600-4700 ft) and 1377.7-1392.9 m (4520-4570 ft). In the lower interval, **Ozarkodina excavata excavata** and **O. confluens** were recovered, as well as a peculiar cruciform element, of undetermined taxonomic assignment. Only **O. confluens** was obtained from the upper interval. The age of these faunas cannot be stated more precisely than as Late Silurian.

Kockelella variabilis Walliser was found in member B of the Read Bay Formation in the interval 1310.6-1328.9 m (4300-4360 ft) of the Russell well. The species has been found also in member B at its type section on Goodsir Creek, eastern Cornwallis Island (Uyeno, 1977), and in the upper part of the Douro Formation on Ellesmere Island (Uyeno, in press). The species is relatively long-ranging, but its upper limit is in the **siluricus** Zone (Walliser, 1964). In view of the occurrence of **ploeckensis** Zone conodonts in the underlying member A, this fauna is assigned to the **siluricus** Zone of late Ludlovian age. Member B in the Victoria Island well, in the interval 1280.2-1298.4 m (4200-4260 ft), yielded fragmentary specimens that can only be assigned to **Ozarkodina**? sp.

In the wells included in this study, member C of the Read Bay Formation only occurs in the Victoria Island well. Three samples were taken from it in this succession, but only the interval of 999.7-1033.3 m (3280-3390) yielded any conodonts and these are referable to **Ozarkodina confluens.** The fauna can only be dated as Late Silurian.

Only the upper member of the Drake Bay Formation was sampled for conodonts. In the Russell well, these conodonts are from the intervals 707.1-719.3 m (2320-2360 ft) and 658.4-688.8 m (2160-2260 ft), and are identifiable as **Ozarkodina remscheidensis**? (Ziegler). The highest interval, from 585.2-621.8 m (1920-2040 ft), yielded **O. remscheidensis remscheidensis.** The lowest and middle intervals, therefore, can only be dated as Pridolian-Lochkovian, whereas the highest is probably of Lochkovian age.

To supplement the data from the upper part of the Russell well, conodonts from the upper member of the Drake Bay Formation were obtained from an outcrop located some 10 km west of the well (GSC loc. C-82456). Mayr (1978, p. 52) estimated that the beds of this outcrop fall within the upper 30 m (100 ft) or so of the stratigraphic succession of the well. The conodonts include **Eognathodus sulcatus sulcatus** Philip, **Pelekysgnathus** n. sp. C of Uyeno (in press), and **Pandorinellina** sp. or **Ozarkodina** sp. As stated earlier, **Pelekysgnathus** n. sp. C has been found previously in the lower part of the Peel Sound Formation. In Nevada, the first-mentioned subspecies is restricted to the **sulcatus** Zone (Klapper, 1977, Fig. 3), but may range higher in the Arctic Island (Uyeno in McGregor and Uyeno, 1972, Table 1). The age of the fauna is Pragian.

In this study, the Peel Sound Formation was encountered only in the Young Bay well. There the formation was sampled at two intervals, the lower 182.9-213.4 m (600-700 ft) of which yielded **Pelekysgnathus** n. sp. C and **Ozarkodina**? sp. The age of the fauna cannot be stated unequivocally, but it is probably about Lochkovian to Pragian.

Eids Formation

The dolomites of the Read Bay Formation are overlain disconformably by a sequence of calcareous shales with minor limestones that is here assigned to the Eids Formation. This formation was found to occur only in the Victoria Island well. The same shale occurs in an isolated outcrop about 24 km west-southwest of the Victoria Island well-site (Thorsteinsson and Tozer, 1962), and was tentatively included in the Blue Fiord Formation. Miall (1976) assigned the shale to the Orksut Formation. Laterally equivalent limestones of the Blue Fiord Formation are present 32 km west of the well-site on Princess Royal Islands. The age of the disconformity between the Read Bay and Eids formations coincides with that of pulse 3 of the Cornwallis Disturbance (Kerr, 1977).

The Eids conodonts from the Victoria Island well were obtained from intervals 115.8-134.1 m (380-440 ft) and 61.0-91.4 m (200-300 ft). The specimens were small and fragmented, and only **Belodella** sp. was identified from the lower interval. Other constituents include pyritized radiolarians and sponge spicules. A.W. Norris (personal communication, September, 1979) identified **Nowakia** cf. **N. cancellata** (Richter) and **Styliolina** sp. from the interval 88.4-118.9 m (290-390 ft). The fauna was dated as Dalejan.

Because of the sparsity of the above data, supplementary materials were sought from outcrops located relatively close to the well-site. The first of these originated from the isolated outcrops of the Eids Formation mentioned above. These samples were collected by A.D. Miall (1976, p. 30; GSC locs. C-30547, C-30548). The Eids conodonts include a Pb element similar to those previously assigned to **Pandorinellina expansa** Uyeno and Mason. The polygnathan element is more difficult to identify; the development of the wide basal cavity is somewhat like that in **Polygnathus inversus** Klapper and Johnson, but the moderately large pit is located far more anteriorly. In some of these features this element approaches more closely to **P.** n. sp. A of Klapper and Johnson (1975). Another polygnathan element, which is badly fragmented, is somewhat similar to that of **Polygnathus costatus** Klapper; the critical free blade is missing, however, and a more precise assignment cannot be made. Based on this limited fauna, the age of the outcropping beds can only be regarded as probably Dalejan to Couvinian.

The second supplementary collection was derived from the Blue Fiord Formation which outcrops on the larger of the Princess Royal Islands. The collecting was done by A.D. Miall (GSC loc. C-30544, C-30545). The conodonts from these beds include **Polygnathus inversus** and a spathognathodontan element that is superficially similar to that of **Pandorinellina optima** (Moskalenko). The fauna can be assigned to the **inversus** Zone, which spans the Zlichovian-Dalejan boundary (Klapper and Ziegler, 1979, Text-fig. 2).

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