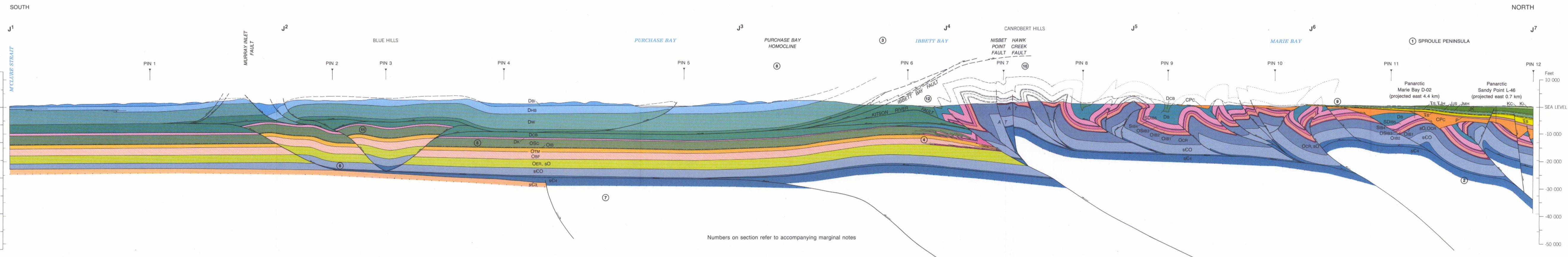
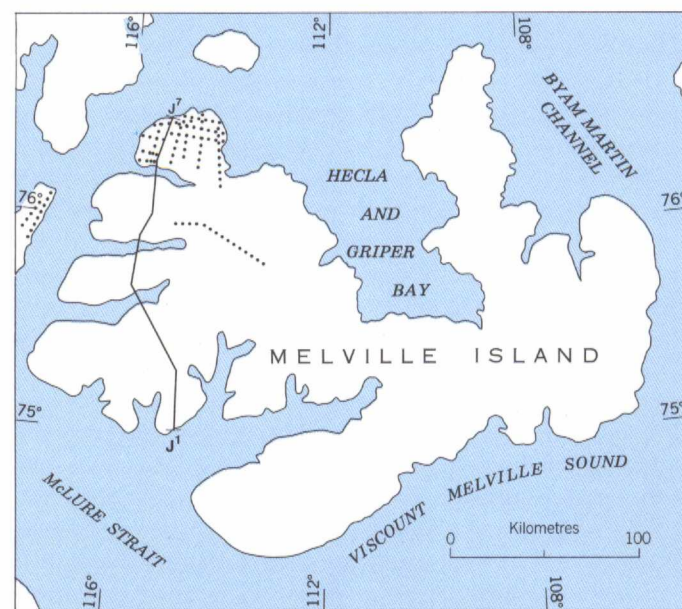
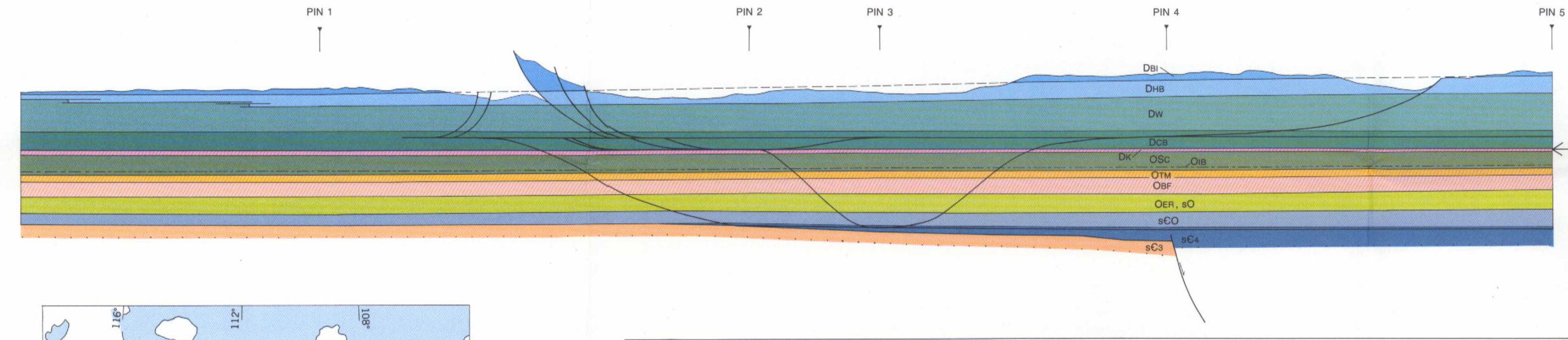


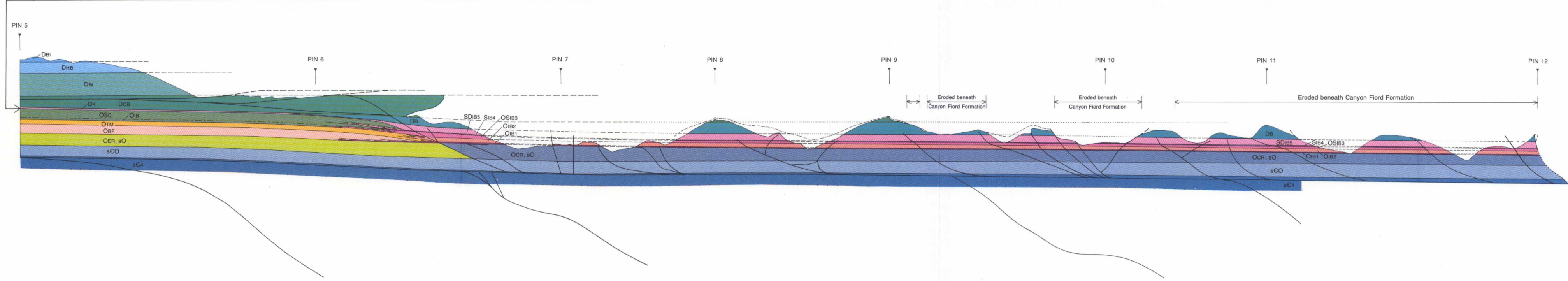
DEFORMED-STATE CROSS-SECTION



RESTORED-STATE CROSS-SECTION



Location of structure sections and seismic profiles
 Line of structure section (with offset) J¹
 Seismic reflection profile (displayed) J²
 Seismic reflection profile (consulted only) J³



NOTES TO ACCOMPANY SECTION J
 (No reprocessed seismic data available)

- Stratigraphic features**
- Unmigrated seismic profiles, some parallel to the line of section, were available for structural interpretation of Sproule Peninsula area (see inset location map). On many of these it is possible to map the unconformity at the base of the upper Paleozoic succession and to determine regional variations in dip in the underlying lower Paleozoic down to 3 or 4 seconds, locally. It is also possible to map the subsurface distribution of folds, vergence of some major thrusts, and to calculate a local depth to detachment by the divergence of primary reflections.
 - Seismic stratigraphic units of subsurface Sproule Peninsula (below the Trold Fiord Formation) include: 1) the Canyon Fiord Formation; 2) Blackley and Cape De Bray Formations and the upper shale member of the Ibbett Bay Formation (undivided); 3) the lower four members of the Ibbett Bay Formation (undivided); 4) the Canrobert Formation and seismic unit sO (undivided, reflection-free unit); and 5) a reflective unit below the Canrobert tentatively assigned to seismic units sCO and sC4 (undivided, base not imaged).
 - The basin facies lower Paleozoic stratigraphy of subsurface Eglinton Island is far better imaged. In this area (located 40 km along tectonic strike west of Ibbett Bay), it is possible to separately distinguish the Weatherall, Cape De Bray and Blackley Formations of the Devonian clastic wedge, to distinguish the upper shale member of the Ibbett Bay Formation, and to identify the base of the reflective unit below the (undivided) Canrobert Formation and seismic unit sO.
 - The location of various Lower Ordovician through Upper Silurian carbonate-to-shale facies transitions are constrained as follows: 1) basin facies rocks occur in all lower Paleozoic exposures north of Ibbett Bay; 2) age-equivalent shelf carbonates are exposed in the Kitson River Inlier and in the Zeus and Kitson River wells located approximately 58 to 64 km east of the line section; 3) the platform carbonate seismic stratigraphy appears to extend east from the Zeus well to the footwall of the Kitson River Fault at a point located 12 km east of the head of Ibbett Bay and 34 km east of the line of section; 4) an Ordovician and/or Silurian carbonate-to-shale transition is seismically mappable in the subsurface of northern Banks Island. This northeasterly trending facies front (carbonates to southeast) extrapolated across M'Clure Strait would cross to subsurface Melville Island beneath Cape Victoria on Warrington Bay. This point is located 43 km west of the south end of the line of section.
 - Thickness variations in Ordovician through Lower Devonian carbonates and mudrocks of subsurface areas south of the Kitson River Fault are based on a linear interpolation of unit thicknesses between the shelf rim stratigraphy of Kitson River Inlier area and the midshelf succession of subsurface western Dundas Peninsula.
 - Location of the updip limit of seismic unit sC4 is based on a presumed westerly trend of the depositional limit from its known locations on Sections E and I.
- Structural features**
- Growth faults are presumed to displace seismic unit sC4 and older units at depth below Blue Hills and Purchase Bay areas. This assumption is based on the observed distribution of such faults beneath Blue Hills Syncline on Section I and a tectonic trend that is presumed to parallel Cambrian(?) isopachs of central Melville Island.
 - Regional uplift of Cambrian(?) and younger units below Purchase Bay Homocline is a feature also observed on reflection profiles of Eglinton Island (situated 40 km to the west). Depth to detachment below the subsurface homocline of Eglinton Island is 3550 m below surface, and 1000 m (estimated 2.75 km) below the top of the reflection-free seismic unit assumed to be the Canrobert Formation. This is similar to the depth to detachment below the top of the age-equivalent Eleanor River Formation below and north of Apollo Anticline (2-1-2.3 km; see Section I).
 - Seismic profiles of northern Sproule Peninsula indicate the existence of an angular unconformity between the Trold Fiord and Canyon Fiord Formations. The extent of folding of the sub-Carboniferous unconformity remains uncertain in all subsurface areas of Sproule Peninsula. Some paleogeography on the sub-Canyon Fiord surface is also possible.
 - The Hawk Creek and Nisbet Point faults each display 2.5 km of right-lateral displacement near the line of cross-section. These faults also offset and die out within the Canyon Fiord Formation along strike to the east.
 - Minimum displacement on subsurface thrusts assumed to exist beneath the Blue Hills, can be determined by removing later extensional displacements on Murray Inlet Fault and associated splays.
 - Southerly directed slip on faults situated above and below the detachment within unit sC4 is matched by northerly directed slip on a through-going upper detachment (Ibbett Bay Fault) in the Cape De Bray Formation. The upper detachment exits the line of section through the triangle zone exposed at the surface around Ibbett Bay.
- Depth conversion (Sproule Peninsula only)**
- CPC: 3.6-4.2 km s⁻¹
 DCs: Dc1: est. 3.7 km s⁻¹
 Dc2: Dc3: est. 5.0 km s⁻¹
 Ocn: sCO: est. 5.5 km s⁻¹
 sCO, sC4: est. 5.5 km s⁻¹
- Method of cross-section construction and restoration**
- Bed length measurement and balancing of the contacts above sC4, Dc1, Ocn, OSias, SDias, and Da between pairs of adjacent pin lines. Slip on a basal detachment within sC4 and on an upper detachment within Dc1 is assumed to be negligible south of the Blue Hills structure and pin line 1.
- Independent bed length measurement and balancing of the contacts above Dc2, Dw, and Dns between pairs of adjacent pin lines.
- Area measurement and restoration of sC4, Da, Dc2 and the lower part of Dw (within Purchase Bay Homocline) between pairs of adjacent pin lines. This method assumes that southerly directed slip on the lower detachment within unit sC4 increases progressively to the north beneath the fold belt, and is matched by northerly directed slip on the upper detachment (in Dc2 and lower Dw) which exits the section through Purchase Bay Homocline.
- Results**
- Section length (pin 1 through pin 12): 154.7 km
 Minimum postorogenic extension: 7.5 km
 Pre-extension section length (pin 1-12): 154.7 - 7.5 = 147.2 km
 Bed length of Ocn, OSias (pin 1-12): 193.5 km
 Shortening of Ocn, OSias: 193.5 - 147.2 = 46.3 km
 Estimated shortening in foreland*: 0.0 km
 Total shortening of Ocn, OSias from foreland: 46.3 km (31.4%)
 Bed length of sC3 and sC4 (below detachment): 167.7 km
 Minimum shortening of sC3 and sC4 (below detachment): 167.7 - 147.2 = 20.5 km
 Estimated shortening in foreland*: 0.0 km
 Total minimum shortening of sC3 and sC4 (below detachment): 20.5 km (13.9%)
 Section length (pin 1 through pin 6): 84.8 km
 Minimum postorogenic extension (pin 1-6): 1.4 km
 Pre-extension section length (pin 1-6): 84.8 - 1.4 = 83.4 km
 Bed length of Dns (pin 1-6): 84.7 km
 Minimum shortening of Dns (pin 1-6): 84.7 - 83.4 = 1.3 km
 Estimated shortening in foreland*: 0.0 km
 Total minimum shortening of Dns (pin 1-6): 1.3 km (1.5%)
 Bed length of Ocn (pin 1-6): 89.6 km
 Minimum shortening of Ocn (pin 1-6): 89.6 - 83.4 = 6.2 km
 Estimated shortening in foreland*: 0.0 km
 Total minimum shortening of Ocn (pin 1-6): 6.2 km (6.9%)
 Section length (pin 7 through pin 12): 69.9 km
 Minimum postorogenic extension (pin 1-12): 6.1 km
 Pre-extension section length (pin 7-12): 69.9 - 6.1 = 63.8 km
 Bed length of Ocn, OSias (pin 7-12): 103.9 km
 Minimum shortening of Ocn, OSias (pin 7-12): 103.9 - 63.8 = 40.1 km (38.6%)
 Estimated shortening in foreland (pin 1-6): 6.2 km
 Total minimum shortening of Ocn, OSias (pin 1-12): 6.2 + 40.1 = 46.3 km (31.4%)
 *All strata are assumed to be undeformed (autochthonous) south of pin line 1 at the south end of the line of section.

SECTION J
 (MAP 1844A)
BAILEY POINT (ON M'CLURE STRAIT) TO FITZWILLIAM STRAIT (NEAR SANDY POINT), MELVILLE ISLAND
 DISTRICT OF FRANKLIN
 NORTHWEST TERRITORIES
 Scale 1:250 000



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