



**GEOLOGICAL SURVEY
PAPER 78-22**

**LOWER CRETACEOUS AND JURASSIC ROCKS OF
McDOUGALL PASS AREA AND SOME ADJACENT
AREAS OF NORTH-CENTRAL RICHARDSON
MOUNTAINS, NORTHERN YUKON TERRITORY AND
NORTHWESTERN DISTRICT OF MACKENZIE, N.W.T.
(NTS-116P/9 AND 116 P/10): A REAPPRAISAL**

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APPENDIX

Section No. 2
(Sections JA-F73-17, JA-F75-19/8)

Measured on the middle part of the nameless rocky ridge overlooking Two Ocean Creek from the east and Long Lake from the south. The section is confined between Section 3 in the north and Section 4 in the south so that the three sections actually form one continuous section (see p. 8 and Fig. 1, 2 for further details). The downward sequence is:

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | <u>Upper shale-siltstone division</u> | | |
| | <u>Lower Member</u> | | |
| | <u>(Arenaceous facies)</u> | | |
| | <u>Upper sandstone unit</u> | | |
| 3. | Sandstone, light grey to light brownish grey very fine grained to fine grained, moderately well rounded (subrounded to subangular grains prevail) and sorted, quartzose to orthoquartzitic, mostly noncarbonaceous to slightly carbonaceous with few or no interbeds and pods of ferruginous sandstone. This hard, ridge-forming sandstone ranges to true quartzite and is massive to thick bedded and forms sheer bluffs 45 to 55 m high. It includes several intercalated beds of sandstones 1.5 to 4.5 m thick. These are thinly to indistinctly bedded, partly ferruginous, carbonaceous to coaly, very fine grained and contain abundant coaly inclusions (2.5 to 7.5 cm long and up to 1.3 cm thick), some of which are subvertical and resemble rootlets of plants. These interbeds occur at irregular intervals including the basal 1.5 to 1.8 m exposed. Crossbedding and ripple marks were rarely seen. Very rare generically indeterminate, possibly simbirskitid ammonites and Inoceramus fragments (GSC Cat. 92202) occur in the scree of the lower 18 to 22m; | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | lower contact covered or very poorly exposed but is believed to be abrupt and uneven (?erosion) because of the presence of fine, scattered chert pebbles in the uppermost exposed beds of the Intermediate siltstone unit; upper contact covered and separated from the presumably next younger unit 2 of Section 4 by the covered interval 1 of the same section (see in Appendix) | 90(est) | 600 |
| | <u>Intermediate siltstone unit</u> | | |
| 2. | Siltstone, dark grey or dull to ash grey, fine rubbly to flaky and recessively weathered, friable, micaceous and varies from fairly sandy (mostly in the basal 30.5 m and uppermost 210 m to almost pure; contains some rows of rounded to angular concretions, 1 to 3 cm across, of very hard, blue-grey, bright orange to wine-red weathering, ferruginous siltstone ("clay ironstone"); sandy varieties are commonly bioturbated, with rare to common worm burrows and may be cross-bedded locally on a small scale; lower contact covered but believed to be gradational; no fossils seen | 430(approx.) | 510 |
| | <u>Lower sandstone unit</u> | | |
| 1. | Sandstone, generally lithologically similar to that of the Upper sandstone unit; it differs, however, in containing up to 10 per cent of limonite grains and the same amount of dark mineral (?chert) grains, as well as numerous 10 to 25 cm bands and rows of pods and lenses, up to 4.5 m long and 15 cm to 1.2 m thick, of hard to very hard, dull grey, intensely orange to wine-red weathering, ferruginous sandstone and sandy siltstone ("clay ironstone"). No carbonaceous to coaly interbeds were seen in the unit; generically indeterminate (?simbirskitid) ammonites, subgenerically indeterminate inocerami, generically indeterminate juvenile belemnites and various long- | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | ranging pelecypods occur rarely in the lowermost 18 m exposed beds (GSC 92203 and 92955); the unit forms a sharp-crested, wall-like, 24-27 m high hogsback across the traversed ridge (see Pl. I, Fig. 4); base and top covered; strikes 230° and dips 30°W; the rocks are locally closely jointed and sheared near the visible base but the unit is not markedly disturbed otherwise; judging by the contact relationships in Callomon and Poulton's Section 1 (see p. 8 of the main text) the unit overlies the next older unit 5 of Section 3 with an abrupt and uneven, erosionally disconformable contact; visible | 80 (approx.) | 80 |

Section No. 3
(JA-F73-14 and 17)

McDougall Pass, southern side, measured along the crest of northwest-southeast trending ridge overlooking Two Ocean Creek from the east and centred at lat. 67°40'50"N and long. 136°22'15"W. The section adjoins from the south and immediately underlies the previously described (Jeletzky, 1974, p. 6-7) at least 610 m thick section of arenaceous and argillaceous rocks which is re-interpreted as equivalent of the Lower member of the Upper shale-siltstone division in this paper (see p. 21 and Section 2 in the Appendix). The downward sequence of units is:

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|----------------------------------|--|--|------------|
| | | Unit | Above base |
| <u>Husky Formation</u> | | | |
| <u>Upper argillaceous member</u> | | | |
| 5. | Siltstone, black, weathers same colour, flaky to earthy, and recessively; friable, mostly somewhat to moderately sandy, includes some 10 to 30 cm bands of rounded 7.5-20.5 cm concretions of hard, rust- to orange-weathering clay ironstone; outcrops extremely poor and patchy; mostly only weathered rock seen; occupies the whole width of a broad and low saddle occurring immediately south of pronounced rocky ridge underlain by "Lower sandstone member" (see Jeletzky, 1974, p. 7 for a detailed description of this unit now assigned to the Upper shale-siltstone division); upper and lower contacts concealed by scree but the regular attitude and the fresh appearance of rocks on both sides of the covered intervals contradict the previously postulated presence of a strong strike fault relatively upthrowing the "Lower sandstone member"; about 47.5 m above base some Buchia n. sp. aff. piochii (Gabb) collected from fresh, angular, evidently locally derived scree of clay ironstone (GSC loc. 92204); | 125 | 244 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|---|---|--|------------|
| | | Unit | Above base |
| <u>Porcupine River sandstone (tongue)</u> | | | |
| 4. | Sandstone, light brown when fresh, weathers same or dull brown with orange specks and rubbly or slabby, moderately hard and dense with a fair interstitial porosity, very fine grained, quartzose but with a considerable amount (up to 15 per cent, est.), of orange limonite grains; well rounded and well sorted as to the grain size; mostly thin (7.5 to 13 cm) and well bedded; crossbedded and ripple-marked locally; numerous shells (all single valves) and fragments of pelecypods (mostly Buchia (Anaucella) concentrica Sow.) occur on bedding planes or form 2.5 to 10 cm thick coquinoid layers or pods at a number of levels; lot of Buchia (Anaucella) concentrica (Sow.) s. lato and other pelecypods (GSC loc. 92205) was collected in place 6 m above base; regular strike about 270° with dips 25-30°N; the rock is neither otherwise disturbed nor jointed and/or sheared to any degree; forms a sharp rocky hogsback across the traversed ridge; lower contact appears to be abrupt but is poorly exposed | 13 | 119 |
| <u>Husky Formation</u> | | | |
| <u>Lower argillaceous member</u> | | | |
| 3. | Siltstone as in unit 5; outcrops extremely poor and patchy; mostly only weathered rock seen; occupies the most part of a broad gentle saddle between the hogsback of unit 4 and the steep upper part of the ridge underlain by unit 1; lower contact covered by debris of unit 1; | 65 | 106 |
| 2. | Completely covered by scree of unit 1 about 61 m across the strike of the rocks; assumed to correspond to some 26 m of the section and to be underlain either by siltstone similar to that of unit 3 or by the sandstone similar to that of unit 1. The previously assumed presence of a strong strike fault (with a relatively upthrown southern side) causing the reappearance of the "Lower sandstone member" south of this interval is withdrawn herewith | 26 | 41 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|-------------|--|------------|
| | | Unit | Above base |

Bug Creek Formation

- | | | | |
|----|---|----|----|
| 1. | Sandstone, white to cream coloured when fresh, weathers light to dirty white with black and orange specks, medium to fine grained, mostly orthoquartzite but contains some interbeds of quartzose sandstone particles and dark mineral (?chert) grains; some grains of white ?feldspar (?kaolinized) or white ?chert; grains moderately to poorly rounded (most grains are subrounded to subangular) and moderately to poorly sorted according to the grain size; predominantly hard to very hard and dense with no visible porosity (a quartzite-like sandstone or true quartzite) but includes some interbeds of moderately hard and dense, fairly porous sandstone containing indeterminate fragments of marine pelecypods (no collection made); medium to thick (0.3 to 1.5 m) and indistinctly bedded; weathering-resistant and weathers large blocky and slabby (0.3 to 0.9 m to a side); regular strike 220° to 230° with dips 35° to 40°N and not disturbed otherwise; outcrops mostly poor and intermittent (debris-covered occupies most or all of a 140-150 m high rocky ridge overlooking the saddle occupied by units 2 and 3 from the south; base not reached, visible on the lower part of the ridge | 15 | 15 |
|----|---|----|----|

Unit 1 was previously interpreted as an equivalent of the "Lower sandstone member" of Jeletzky (1974, p. 7) for reasons explained under the discussion of unit 2.

Section No. 4
(JA-F75-19)

McDougall Pass, southern side; measured on the crest of the northeast-southeast trending rocky ridge overlooking Two Ocean Creek from the east. The top of the section is situated about 1.6 km south of Long Lake and the section is confined between approximate lat. 67°42'N; long. 136°24'45"W (top) and lat. 67°41'40"N; long. 136°24'W (base). Its base adjoins from the north and immediately overlies the top of the previously published (Jeletzky, 1974, p. 6-7) section re-interpreted as the Arenaceous facies of the Lower member of the Upper shale-siltstone division in this paper (see Section 2 in the Appendix and Fig. 2). The downward sequence of units is:

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|---------------------------------|---|--|------------|
| | | Unit | Above base |
| <u>Upper Sandstone Division</u> | | | |
| 7. | Siltstone, dull-grey when fresh, weathers dark to rust-brown, and slabby, sandy to very sandy and grades locally into very fine grained, very silty sandstone; hard to very hard (flinty), very dense and mostly thoroughly silicified; thinly (2.5 to 10 cm) and pronouncedly bedded throughout; crossbedded and ripple marked on a large scale (20.5 to 46 cm between crests) for the most part; weathering-resistant and forms a bold to vertical-sided 10.5 to 12 m high bluff atop of prominent hogback crossing the traversed ridge; general strike 270°; general dip 20-25°N; rich pelecypod fauna including: Astarte n. sp. aff. cantabrigiensis Woods, Pecten (Entolium), n. sp. A. and Pleuromya cf. kelleri Imlay (GSC Cat 92958 and 92956) occurs at several levels within the unit and forms several 2.5 to 10 cm thick coquinoid interbeds and lenses; lower contact abrupt and uneven but no basal conglomerate or basal gritty layer noted; top not reached at hogback's crest | 15.5 | 243 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|---------------------------------------|---|--|------------|
| | | Unit | Above base |
| <u>Upper-shale-siltstone division</u> | | | |
| <u>Upper member</u> | | | |
| 6. | Irregular but distinctly cyclical, thin (7.5 to 15 cm) to thick (0.3 to 1.5 m) interbedding of siltstone as in unit 7 with: a) Siltstone, black to dark-grey when fresh, weathers dull grey, flaky to chippy, and recessively, friable, pure to somewhat sandy, micaceous, massive-looking to fissile; and b) Siltstone, black, dark-grey or bluish grey, moderately hard, sandy, either thinly bedded with strongly corrugated bedding planes or laminated and intensively crossbedded on a micro- to small scale (?current type) and ripple marked on a small scale (7.5 to 20.5 cm between crests); the corrugated bedded variety is strongly bioturbated and rich in various trails and worm burrows (no segmented, Nereites -like types seen); only very rare indeterminate pelecypods seen, except at the level 4.5 m below top where a fairly abundant fauna of long-ranging, Mid-Lower Cretaceous pelecypods was collected (GSC Cat. 92957); general attitude as in unit 7 but the rocks are locally disturbed; outcrops are poor and intermittent in the basal beds beginning with the level 68 m below the top; lower contact either covered or poorly exposed but the unit seems to grade downward into the unit 5; | 81 | 227.5 |
| 5. | Siltstone, black to dark grey, weathers dull grey, flaky to chippy and recessively, friable, pure to somewhat sandy, micaceous, massive-looking to fissile; includes a few thin (2.5 to 15 cm) interbeds of hard, sandy siltstone as in the preceding unit in the uppermost 15 m; outcrops poor and intermittent; becomes strongly sandy, mottled dull grey to brown grey, hard and weathers chunky in the basal 15 m and grades downward into sandstone of the unit 4; | 114 | 146.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|--|--|--|------------|
| | | Unit | Above base |
| <u>Arenaceous facies of the Lower member</u> | | | |
| <u>Upper sandstone unit</u> | | | |
| 4. | Sandstone, mottled dark grey, brown grey, and ash-grey, in fresh and weathered state, very fine grained, quartzose but distinctly silty and carbonaceous to coaly, moderately hard to friable and with a fair interstitial porosity; weathers recessively and fine chunky, very strongly bioturbated and rich in various worm burrows and trails; massive-looking to extremely irregularly (conchoidally to corrugatedly) bedded; lower contact poorly exposed but appears to be sharp and uneven; it may be overlain by a few inches thick, basal, fine to medium pebble-conglomerate consisting of chert pebbles; the unit underlies the central part of a broad very deep saddle in the transversal ridge which adjoins from the north the prominent hogback of the principal unit of the "Upper sandstone member" described by Jeletzky (1974, p. 6-7); | 13.5 | 32.5 |
| 3. | Irregular, probably lenticular, thin (5 to 15 cm beds) interbedding of: a) sandstone, dark grey, fine to coarse grained, extremely poorly rounded (angular to subangular grains are prevalent) and extremely poorly sorted as to the grain size, mostly fine to coarse, gritty, and fine to very fine (0.3 to 0.6 cm pebbles are prevalent) pebbly; scattered grit and pebble clasts are invariably angular to subangular; strongly carbonaceous to coaly and contains 0.6 to 2.5 cm inclusions of coaly matter and poor, mostly 1.3 to 5 cm plant fragments (mostly bark and wood); fairly quartzose (?70 to 75 per cent; rough estimate) but contains a considerable admixture of dark mineral (?chert) grains, coaly particles and orange limonite grains (together comprising 25 to 30 per cent; rough estimate); and b) fine to coarse grit (lithologically similar to the interbedded conglomerate) and fine | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | to very fine pebble conglomerate consisting largely of 0.3 to 1.3 cm, angular to subangular chert and quartz pebbles; the conglomerate is rich in arenaceous matrix similar to that of intercalated sandstone 'a' described above; both rocks are friable and weather recessively; no marine fossils seen; outcrops poor and intermittent; lower contact gradational; | 2.5 | 19 |
| 2. | Sandstone, whitish grey to dirty white when fresh, weathers same but mottled and with rusty specks and spots; very fine grained and grades into very sandy siltstone; orthoquartzite to quartzose with a 5 to 10 per cent (est.) admixture of black, carbonaceous and cream to white, ?kaolinized feldspar (or ?white chert) grains; subrounded to rounded grains are prevalent and the rock is well sorted as to the grain size; massive-looking to medium (15 to 45.5 cm) but indistinctly bedded. No cross-bedding or ripple marks seen; weathering-resistant and forms a stack-like projecting exposure on the western side of the previously mentioned deep saddle; regular strike 230-240°, regular dip 20° NW and the unit is not disturbed otherwise; base covered; | 4 | 16.5 |
| 1. | Covered by debris on the lower part of the southern slope of prominent rocky hogsback of the principal unit of the "Upper sandstone member" previously described by Jeletzky (1974, p. 6-7) and presumably underlain by more friable arenaceous rocks; width about 36.5 m across general strike; assumed to correspond to 12.5 m of the section; | 12.5 | 12.5 |

Section No. 5
(Sections JA-73-9; JA-73-10, JA-F73-14 and JA-75-23)

Measured (and visually estimated in part) on the northeastern shoulder of a nameless 765 m high, mesa-like mountain overlooking Summit Lake from the south (see Fig. 2, 3 for further details). The section is centred at lat. 67°41'40"N, long. 136°23'30"W. The numeration of beds and units conflicting with that of other sections reproduced in this Appendix is retained in order to facilitate the use of the earlier paper of Jeletzky (1974, p. 8) where a different, now abandoned interpretation of this section was published.

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|---------------------------------------|---|--|------------|
| | | Unit | Above base |
| <u>Upper shale-siltstone division</u> | | | |
| <u>Upper member</u> | | | |
| 1. | Siltstone, jet-black, mostly pure, micaceous, friable, recessive, weathers flaky to fine rubbly; some rounded, 0.3-0.6 m concretions of hard, bright orange weathering clay ironstone; top not reached in the syncline's axis on top of the butte (Fig. 3); no fossils seen; lower contact gradational; visible; | 45 (est.) | 682 |
| 2 | Siltstone, jet-black to dark brownish grey, slightly to markedly sandy for the most part, otherwise as in unit 1; contains a considerable number of dull grey to brown-grey, sandy to very sandy, moderately hard siltstone interbeds increasing downward in the section; regular strike 330°, dips 17°E; locally strongly bioturbated with abundant worm burrows; no fossils seen; lower contact gradational | 40 (est.) | 637 |
| <u>Lower Member</u> | | | |
| <u>(arenaceous facies)</u> | | | |
| <u>Upper sandstone unit</u> | | | |
| <u>(siltstone facies)</u> | | | |
| 3. | Siltstone similar to the more sandy varieties of unit 2, except for being hard and resistant; forms a 12 m high precipitous bluff; no fossils seen; lower contact covered | 15 (est.) | 597 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|--|---|--|------------|
| | | Unit | Above base |
| <u>Intermediate siltstone unit</u> | | | |
| 4. | Siltstone much as in unit 1 but with some shale interbeds and poor in clay ironstone concretions; no fossils seen; attitude as in unit 2 except near the base where the dips steepen rapidly to 50° to 60° SE; lower contact gradational | 215 (est.) | 582 |
| <u>Lower sandstone unit</u> | | | |
| 5. | Sandstone, brownish grey to dull grey, weathers dull brown to light brown or light grey, very fine grained, silty but fairly quartzose, hard and dense but not quartzite-like and with some visible porosity; thin bedded to laminated and commonly crossbedded on a small scale; locally ripple-marked; no fossils seen; closely jointed and commonly cut by calcite veinlets; strike 200°, dip 60° to 65° SE; attitude as in basal beds of unit 4; lower contact abrupt, uneven and apparently erosionally disconformable | 12 (est.) | 367 |
| <u>Husky Formation</u> | | | |
| <u>Upper argillaceous member</u> | | | |
| 6. | Siltstone lithologically similar to that of unit 2; closely jointed, partly sheared, and includes many calcite veinlets; attitude as in unit 5; no fossils seen; lower contact obscured by debris | 29 (approx.) | 355 |
| <u>Porcupine River sandstone (tongue of)</u> | | | |
| 7. | Sandstone, lithologically similar to that of the unit 5 but with some 15 cm to 45 cm interbeds of coquinoid, intensively ripple-marked sandstone containing an abundant shallow water pelecypod fauna (GSC loc. 92135) of the lower part (?upper Oxfordian) of Buchia (Anaucella) concentrica Zone; general strike 210° to 220°, dips vary from about 90° to 80°E; rock is literally shattered, being split up into sharp 2.5 cm to 7.5 cm wide and 12.5 cm to 30 cm splinters by extremely closely spaced (from a few mm to 5 cm) joints of several directions and is shot through by calcite veinlets; lower contact gradational | 4 (approx.) | 326 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 8. | Siltstone lithologically similar to that of units 2 and 6; general attitude as in unit 7 and the rock is equally strongly disturbed; the unit is apparently cut through by a high angle fault as explained in the explanation of Fig. 3, which see for further details; no fossils seen; lower contact appears to be gradational but is poorly exposed | 30 | 322 |
| | <u>Porcupine River sandstone</u> (tongue of) | | |
| 9. | Sandstone as in unit 7; general attitude as in units 7 and 8; the rock is very closely (spaced from a few mm to 5 cm) jointed; joints have the prevalent attitudes 290°/45°-50°E and 310°/60°-80°W; it is also cut by a number of calcite veinlets, and locally sheared and slicken-sided, as stated in the text and explanation of Fig. 3; unit 9 is the same unit as 7 repeated by a strong, high angle fault; abundant shallow water pelecypod fauna, (GSC loc. 92136) including early forms of Buchia (Anaucella) concentrica (Sowerby), occurs in the topmost few cm to 1 m represented by a coquinoid sandstone; some similar coquinoid interbeds occur farther down; lower contact gradational | 20 (approx.) | 292 |
| | <u>Husky Formation</u> <u>Lower argillaceous member</u> | | |
| 10. | Siltstone, similar to that of the unit 1; attitude as in unit 9; no fossils seen; outcrops are invariably poor and deeply weathered; appears to grade downward into unit 11 but the contact is poorly exposed | 90 (approx.) | 272 |
| | <u>Bug Creek Formation</u> | | |
| 11. | Sandstone, colour varies from dull or dark grey to light brown when fresh, weathers light grey to dirty white with some orange to rusty specks, fine to very fine grained, quartzose to ortho-quartzite, locally carbonaceous, hard and dense but not quartzite-like or true quartzite (i.e. | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | <p>exhibits at least some visible porosity); grains mostly subrounded to sub-angular; sorting according to size fair to good; mostly medium to heavily and indistinctly bedded but includes some thinly bedded to laminated, partly coquinoid interbeds; weathering-resistant and forms a high, sharp- topped ridge (see Fig. 3) across the traversed shoulder; general strike 225°, approx. dip. 60°E; the rock is commonly closely jointed and locally faulted on a small scale; outcrops mostly poor and debris-covered; rich but poorly preserved fauna (GSC loc. 92971) of large thick-shelled pelecypods (including Inoceramus (Retroceramus) sp. indet. and belemnites (Pachyteuthis (s. lato) sp. indet. and ?Cylindroteuthis (s. lato) sp. indet.) of Mid-Jurassic (?late Bajocian or ?early Bathonian) affinities was collected from the basal 30 to 60 cm of the unit represented by thinly bedded to laminated coquinoid sandstone; no collections were made in the younger coquinoid interbeds); base covered; visible</p> | 90 (est.) | 182 |
| 12. | <p>A completely covered interval presumably concealing the Jurassic-Permian contact; apparently corresponds to about 3 m of section</p> | 3 (est.) | 92 |
| | <p style="text-align: center;"><u>Permian</u> ("Rusty beds")</p> | | |
| 13. | <p>Siltstone, brownish grey to dull brown when fresh, weathers intensily rust-coloured or rust-brown, very hard and dense (silicified) with no visible interstitial porosity; medium to very thick (0.3 to 1.5 m) bedded; bedding planes sharply defined; weathering-resistant and forms a bluff across the traversed slope (see Fig. 3); strikes 220 to 225° and dips about 60°SE; rich in Spirophyton-like whorls; base covered; visible</p> | 14 (est.) | 89 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 14. | Siltstone, dark grey, friable, weathers recessively and flaky; includes some clay ironstone concretions and bands and some interbeds of hard, weathering-resistant siltstone as in unit 13; outcrops very poor and patchy; both contacts covered; no fossils seen | 45 (est.) | 75 |
| 15. | Siltstone, lithologically similar to that of unit 13 but coloured mottled grey to light grey with dark grey inclusions when fresh and weathers more intensively rust- to orange-coloured, moderately hard and dense and not appreciably silicified, sandy, thinly to very thinly (2.5 to 10 cm) but highly irregular (corrugatedly to conchoidally) bedded and strongly bioturbated throughout; very rich in Spirophyton -like whorls throughout (no collection made); no other fossils seen; contains numerous, apparently persistent 5 to 20 cm bands of rust- to orange-red-weathering, pure to sandy siltstone (clay ironstone-like) at 1 to 3 m intervals; very closely jointed but not contorted; attitude as in unit 13; weathering-resistant and forms a knife-like edged ridge across the slope; base not reached; visible | 30 (est.) | 30 |

Section No. 6
(Section JA-F75-11)

Measured on southeastern shoulder and atop of a nameless about 1219 m high mesa-like mountain (see Jeletzky, 1974, p. 15, Fig. 5; this paper, Fig. 1) separating the valleys of two nameless creeks flowing into Bell River from SE. The section is situated about 9.5 km south-southeast of the confluence of Bell and Little Bell rivers and is centred at long. 136°33'45"W and lat. 67°39'30"N. (the section was measured upward but is rearranged to read downward).

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|-------------|--|------------|
| | | Unit | Above base |

Upper Sandstone Division

11. Sandstone, dull brown to brown grey when fresh weathers rust- to orange-coloured, predominantly quartzose but with some admixture of mica flakes, dark mineral (?chert), and orange limonite grains, very fine grained and locally grades into superficially similar, very sandy siltstone; commonly calcareous, strongly ferruginous for the most part; hard and dense but mostly exhibits some interstitial porosity and is neither quartzite-like nor true quartzite; weathering-resistant and forms a distinct hogsback across the top of mesa-like mountain traversed, occurs in thick (0.30 to 1.5 m) beds separated from each other by laminae, thin layers (1 to 2 cm), or 20 to 30 cm thick interbeds of dark grey to rust- or orange-coloured, mostly sandy to very sandy siltstone; contact planes of individual sandstone beds tend to be abrupt but only a few ripple marks of large-scale crossbeds have been seen either on these planes or within the sandstone beds concerned; the basal 19-20 m are unfossiliferous, except for the level about 7 to 7.5 m above assigned base where several bedding planes within interbeds of hard sandstone contain abundant but poorly preserved pelecypods including: ?*Aucellina* ex gr. *caucasica-aptiensis*, *Tellina* sp. indet., ?*Anomia* sp. indet., *Astarte* sp. indet. (CSC loc. 92929); above 20 m level the sandstone becomes strongly ferruginous, rust-weathering and contains frequent 1 to 5 cm

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | <p>thick interbeds of coquinoid calcareous sandstone replete in characteristic Aptian-Albian pelecypods including: <i>Astarte</i> n. sp. aff. <i>A. cantabrigiensis</i> Woods, <i>Pleuromya kelleri</i> Imlay, <i>Arctica</i> cf. <i>limpidiana</i> McLearn, <i>Tancredia</i> cf. <i>kurupana</i> Imlay, <i>Thracia</i> cf. <i>kissoumi</i> McLearn, and <i>Nucula</i> cf. <i>athabascensis</i> McLearn (e.g. in GSC loc. 92931 collected 23 m above assigned base of unit 11). This fauna does not include any <i>Aucellina</i> or <i>Inoceramus</i>. The pelecypods of the fauna lived exactly where they occur now as most shells are bivalved specimens either closed shut or only gaping. Furthermore, the fauna consists almost exclusively of thin shelled, deeply burrowing forms; this very fine grained, silty sandstone, either lacks ripple marks and large scale crossbeds or contains but few of these structures; above 30 m level the sandstone includes numerous 7.5 to 30 cm thick bands, rows of up to 20 m long and 7.6 to 45 cm thick inclusions of dull grey to brown when fresh, orange to vermillion-red weathering, very ferruginous, very fine grained, silty sandstone or superficially similar very sandy siltstone mostly replete with the above-listed Hauterivian-Albian pelecypods (e.g. GSC loc. 92932, collected 5 m below visible top of the unit); these ferruginous bands, lenses and inclusions have a "clay ironstone-like" appearance, although only a few of the most silty examples approach true clay ironstone in their lithology; the intervening, above described sandstones are also fossiliferous but the bulk of pelecypods is concentrated in the "clay ironstone" bands and inclusions where most shells are preserved in a life-like position with valves closed shut or only gaping; the ratio of interbeds and pods of sandy to very sandy siltstone gradually increases upward until they become prominent (at least 35-40 per cent of the section) in the uppermost couple of metres exposed; strike (regular) 330°; dip (regular) 20°W; grades downward into unit 10; top not reached in the axis of a major NE-SW-trending syncline occurring in the middle of the mesa-like mountain; visible</p> | 43 | 519 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 10. | Regular and distinctly cyclical interbedding of siltstone and sandstone as in unit 11; siltstone is predominant (60-70 per cent of thickness) while sandstone is subordinate (30-40 per cent of thickness); siltstone forms 0.10 to 1.5 m beds while sandstone forms 0.10 to 0.5 m beds; siltstone includes dark grey to black, friable, fine chippy- to flaky-weathering, massive varieties as well as hard, sandy, intensively crossbedded and ripple marked, lighter grey varieties; the latter are commonly rich in 0.1 to 2 cm in diameter worm burrows and trails; no fossils seen; both contacts are gradational with the siltstone interbeds gradually decreasing in number and thickness toward them; thickness | 11 | 476 |
| 9. | Sandstone as in unit 7 and with the same laminae, layers, and interbeds of siltstone. About 0.5 m above base a series of climbing ripples (Pl. III, Fig. 4) indicates a northern direction of currents | 11 | 465 |
| 8. | Regular and distinctly cyclical interbedding of siltstone and sandstone as in unit 10; both contacts gradational as in that unit | 19 | 454 |
| 7. | Sandstone, dull grey to light grey when fresh, weathers mottled light- to ash-grey and dull to rust-brown, predominantly quartzose but with some admixture of mica flakes, dark mineral (?chert), and limonite grains; very fine grained and grades locally into sandy siltstone, dense and hard but neither quartzite-like nor true quartzite, weathering-resistant and forms the southern rim of the mountain's top and a series of steep benches across the uppermost part of the traversed shoulder (see Jeletzky, 1974, p. 15, Fig. 5); weathers slabby to medium rubbly; forms a series of 0.30 to 1.5 m beds separated from each other by laminae, thin layers (1 to 2 cm) or 20 to 30 cm interbeds of dark grey siltstone as in underlying beds of the Upper shale-siltstone division; both contacts of individual sandstone | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | beds with intervening siltstone interbeds are abrupt (see Pl. III, fig. 1); these bedding planes may be either even or covered by load-cast-like structures; they commonly carry series of medium to large (from 6 to 40 cm between the crests) symmetrical, sharp- to round-crested oscillatory ripple marks and interference ripples; individual sandstone beds may be either massive-looking or thinly bedded to laminated; they may be crossbedded and ripple marked on medium to large scale throughout (see Pl. III, Fig. 3); worm burrows and trails and signs of bioturbation mostly completely absent within the sandstone beds but may be present in siltstone interbeds; strike (regular) 330°; dip (regular) 20°W; no fossils seen; grades downward into unit 6 through gradual decrease of number and thickness of sandstone beds | 15 | 435 |
| | <u>Upper shale-siltstone division</u> | | |
| | <u>Upper member</u> | | |
| 6. | Regular and cyclical alternation of sandstone and siltstone similar to that occurring in unit 8 and 10 of Upper sandstone division; sandstone and siltstone alternate in beds 0.30 to 1.5 m thick; sandstone is somewhat more common than siltstone throughout the unit; siltstone is sandy, commonly very hard and dense and flinty; interbeds of this siltstone are rich in medium-sized (8-14 cm between crests), symmetrical ripple marks with sharp crests; they are also intensively crossbedded on medium to large scale; both contacts gradational | 12 | 420 |
| 5. | Siltstone, multicoloured with brown to rust, black and grey lamellae and thin 2-15 cm beds alternating rhythmically; brown to rust coloured laminae and interbeds tend to be moderately hard to hard and moderately to very (rarely) sandy while black to grey varieties tend to consist of fairly friable and feebly sandy to almost pure siltstone; harder and sandier varieties weather fine rubbly while more friable, less sandy varieties weather flaky and, locally, pencil-like; the lower contacts of brown to | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | rust-coloured, sandier interbeds tend to be abrupt while their contacts with the overlying black to grey, less sandy to almost pure silty interbeds tend to be gradational; the brown to rust-weathering interbeds are low angle current crossbedded and graded (units D-F or E-F of Bouma (1962) sequence only) as those of the underlying unit 4; hardly any concretions were noted; the unit includes a number of irregularly distributed 10 cm to 1.5 m thick interbeds of dull grey to greenish grey when fresh, brown to rust-weathering, very fine grained, more or less silty, hard and dense, quartzose sandstone; the thickest 1.2 to 1.5 m thick interbed occurs at 45.5 to 47.0 m level; these sandstones are mostly current crossbedded on a small scale and may exhibit medium-sized (8 to 25 cm between crests) symmetrical, round-crested ripple marks; either lower or upper contact may be abrupt or gradational and no distinct grading was seen within the interbeds; when the lower contact is abrupt and uneven (as for example at 45.5 to 47 m level below top) sandstone includes angular (chips) to rounded siltstone fragments evidently torn off the underlying argillaceous beds; no fossils seen; to 158 m level above base strikes 340°-345° and dips 20°W; above that level strikes 310° and dips 20°W; upper contact gradational | 169 | 408 |
| 4. | Siltstone multicoloured and laminated to thinly bedded as in unit 5 but completely devoid of sandstone interbeds and relatively enriched in 1 to 5 cm interbeds and lamellae of rust- to orange-weathering, ferruginous, moderately hard, more or less sandy siltstone; like the lithologically similar siltstone interbeds and lamellae of unit 5, these interbeds and lamellae are mostly intensively current (low angle) cross-bedded on a small scale (a few cm between crests) and have an abrupt but even, lower contact; the contact with overlying black to | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | <p>grey, feebly sandy to almost pure, massive siltstone interbeds or laminae is gradational and some of the beds are distinctly graded including either D-F or at least E-F intervals of Bouma (1962) sequence; the lower surfaces (soles) of brown to rust-coloured, graded interbeds are commonly rich in worm burrows; the locally present concretionary swellings of rust to brown-coloured interbeds are particularly strongly burrowed by worms; no load-cast structures or chips of underlying black to grey siltstone have been noted above their soles; the cyclical alternation of above described brown to rust-weathering current-affected interbeds with massive to fissile or parallel-laminated, 2 to 15 cm thick interbeds of black to dark grey siltstone imparts a somewhat flyschoid appearance to the here discussed unit; however, like the lithologically similar unit 5, the unit 4 is not believed to be a turbidite because of an apparently total absence of complete Bouma (1962) sequences, relative rarity of above described partial (i.e. D-F or E-F) Bouma (1962) sequences, and the absence of erosional lower contacts; no fossils seen; regular strike 320°; regular dip 25°W; except at the level 15 m above base where the rocks are disturbed and in the topmost 3 to 4 m where the rocks are either tectonically (?faulting) or mass-movement disturbed, forming what appears to be a small supplementary syncline; both contacts gradational</p> | 35 | 239 |
| 3. | <p>Siltstone, multicoloured and laminated with brown to black, 0.25 to 1 cm laminae alternating regularly throughout the unit (Pl. III, fig. 2); siltstone is mostly pure to slightly sandy and massive to fissile within the laminae; weathers flaky, fine rubbly, or locally pencil-like; signs of bioturbation and worm burrows are rare; low angle crossbedding characteristic of units 4 and 5 is rare and restricted to a few yellow to orange-weathering interbeds; only small (1 to 2 cm in diameter), rounded, very hard, dull grey siltstone concretions and larger (3 to 10 cm in diameter) irregularly rounded, rust-weathering, very hard clay</p> | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | ironstone concretions occur rarely and irregularly scattered in some beds; no fossils seen; rocks are disturbed in basal 20 m of the unit where they appear to form a minor supplementary anticlinal fold; higher up they strike (somewhat irregularly) from 320° to 350° and dip 10° to 50°W to the top of the unit where another disturbed zone occurs; upper contact gradational | 45 | 204 |
| | <u>Lower Member</u> (Shelf facies) | | |
| 2. | Siltstone, mottled dull to bluish grey coloured throughout because of an intensive burrowing by mudeaters (bioturbation), weathers same and thin platy, generally very thinly bedded to laminated but with uneven bedding planes commonly covered by worm burrows, feebly to very sandy but apparently noncarbonaceous, fairly friable; above 10.5 m level becomes indistinctly bedded, more uniformly coloured and weathers fine rubbly instead of platy; above 100 m level includes some intervals of multicoloured and laminated siltstone as in unit 3; includes some 3 to 6 cm in diameter, angular clay ironstone concretions above 10.5 m level; 3 to 7.5 cm cannonball-like concretions of hard, dark grey siltstone and angular concretions 0.3 to 0.6 m in diameter of hard, dark to dull grey, orange weathering, unfossiliferous clay ironstone appear above 46 m level; no fossils seen; upper contact gradational; strike (regular) near the base 350° with dip 30°W; higher up section the strike gradually changes to 230° and dips decrease to 15-20°W at 98-99 m; farther upsection rocks are disturbed with disorderly strikes and dips ranging from 0° to 55°W in the interval 99 to 110.5 m; still farther upsection strikes revert to 230° to 245° with dips 25° to 35°W and these attitudes prevail to the top of the unit; no basal conglomerate noted at the contact with unit 1 | 155 | 159 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | <u>Husky Formation</u> | | |
| | <u>Mount Millen Member</u> | | |
| | <u>Lower nonmarine unit</u> | | |
| | (Alluvial facies) | | |
| 1. | Sandstone, mottled whitish grey, light grey and dull brown, fairly quartzose (?70 to 80 per cent) but contains 3-5 per cent (est.) of orange limonite grains, 10-25 per (est.) of black coal grains, and some grains of kaolinized feldspar and chert; predominantly fine grained but poorly rounded (subangular to angular grains prevail) and sorted as to the grain size; mostly contains a minor to major admixture of medium to coarse, angular grains and grit particles predominantly of quartz but including also ?kaolinized feldspar, chert, and coal; fairly burrowed for the most part and completely bioturbated in places; massive-looking to very indistinctly and irregularly (corrugated to knotty) bedded, hard and dense but neither true quartzite nor quartzite-like for the most part; some interstitial porosity locally; contains scattered small quartz and chert pebbles (0.3 to 1.3 cm) and 2.5 to 5 cm thick pods and lenses of medium to coarse-grained, gritty and pebbly sandstone; the uppermost 0.3 to 0.5 m are coaly and rich in sub-vertical, root-like structures filled up with dark grey, carbonaceous to coaly matter; upper contact poorly exposed but appears to be abrupt and uneven (erosional); no fossils seen; strike (regular) 205°; dip (regular) 50°W; unit 1 is an extension of unit 24 of Section No. 7 repeated by a strong fault striking about 360° and dipping about 90° | 4 | 4 |

Section No. 7
(Field No. JA-F73-20)

Measured along the crest of divide between two nameless creeks falling into Bell River from SE at the point situated about 9 km south-southeast of the confluence of Bell and Little Bell rivers (long. 136°33'45"W; lat. 67°39'30"N). Measured upward but re-arranged to read downward. The downward sequence of rocks is:

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|---------------------------------------|---|--|------------|
| | | Unit | Above base |
| <u>Upper shale-siltstone division</u> | | | |
| <u>Lower member</u> | | | |
| (Shelf facies) | | | |
| 25. | Siltstone, dull to bluish grey when fresh, mottled throughout because of intensive bioturbation, weathers same and thin platy; feebly to very sandy but apparently noncarbonaceous, fairly friable; generally very thinly bedded to laminated but with uneven bedding planes which are commonly covered by worm burrows; above 10.5 m level becomes indistinctly bedded, more uniformly coloured and weathers fine rubbly instead of platy; some 0.3-0.5 m angular clay ironstone concretions appear above this level; no fossils of any kind seen; near visible top becomes closely jointed and sheared; shears mostly strike 200-205° and dip 85°W to about 90°; top cut off by a strong fault; lower contact covered but believed to be abrupt and disconformable for reasons explained on p. 21, 32 of this report; visible | 47 | 396 |
| <u>Husky Formation</u> | | | |
| <u>Mount Millen Member</u> | | | |
| <u>Lower nonmarine unit</u> | | | |
| (Alluvial facies) | | | |
| 24. | Sandstone, similar to that of basal 2.5 m of the unit 18 but more ferruginous and contains considerable 15 to 30 cm thick, lenticular interbeds of bright-orange-weathering, very fine grained but gritty, strongly ferruginous sandstone and similar sandy siltstone; these | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | interbeds are partly transformed into limonite crusts and geodes; the sandstone remains fine grained throughout the thickness of the bed in spite of a very poor sorting and rounding of grains; attitude as in bed 16; thickness (approx.) | 3 | 349 |
| 23. | Sandstone, as in unit 21 but dull to dark brown instead of rust-weathering and carbonaceous to coaly throughout, upper contact gradational | 4 | 346 |
| 22. | Sandstone, buff to rust coloured, weathers cream to dirty white coloured, coarse- to very coarse grained, gritty and fine pebbly and includes some 2.5 to 5 cm interbeds and pods of fine to coarse, fine pebbly grit; similar in lithology, and degree of sorting and rounding of grains to the uppermost 0.6 to 0.9 m of unit 18 but is generally massive-looking and weathers medium blocky to slabby (0.3 to 0.9 m to a side) although actually thinly bedded to laminated internally; noncarbonaceous (unlike the bed 18); both contacts covered | 4 | 342 |
| 21. | Sandstone as in unit 16 but fairly friable and ferruginous; weathers intensively rust-coloured, fine rubbly and recessively; both contacts covered | 3.5 | 338 |
| 20. | Grit, buff to mottled yellow, weathers same, fine to coarse, mostly fine to very fine pebbly; lithology as for grit inclusions and interbeds in units 16 and 18 but generally noncarbonaceous; includes 2.5 to 5 cm thick and several decimeters long pods of fine to very fine conglomerate and some 2.5 to 10 cm thick and several decimetres long lenses and similarly thick pods of coarse grained, gritty and fine pebbly sandstone; hard but not quartzite- like, fairly porous, thinly to medium (7.5-25 cm) but indistinctly and unevenly (corrugatedly) bedded, attitude as in bed 16; both contacts covered | 1 | 334.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| 19. | Siltstone, as in unit 15, etc; exposures very poor | 1.5 | 333.5 |
| 18. | Sandstone, dark grey with dark brown and light grey spots, weathers mottled dull and dark-brown, mostly fine to medium grained and with only minor pods and lenses of coarse grained sandstone and grit in the lower 2.5 m; higher up includes considerable ratio (30 to 35 per cent) of thin (5 to 15 cm) lenticular interbeds of coarse grained, gritty and fine pebbly sandstone and some such interbeds of fine to very fine pebbly conglomerate; character of bedding, mineralogical composition, degree of sorting and rounding of grains and clasts as in bed 16 but the rock is, in part, considerably stronger carbonaceous to coaly and commonly contains thin lamellae and 0.30 to 1.25 cm thick and several inches long inclusions of impure to pure coal (mostly as sharply defined, angular fragments) evidently ripped up nearby; generally speaking the sandstone is strongest coaly in the basal few feet and becomes less and less so upward while becoming gradually coarser and coarser grained in the same direction; contains some clay ironstone pods and bands 7.5 to 12.5 cm thick; the topmost 0.6 to 0.9 m consist of irregular, thin interbedding of generally noncarbonaceous, fine to coarse grained sandstone, fine pebbly grit, and very fine to fine, mostly poorly to moderately well rounded pebble conglomerate; quartz pebbles predominate but chert, clay ironstone and kaolinized feldspar pebbles are also common; attitude as in bed 16; lower contact abrupt and uneven; upper contact poorly exposed but apparently abrupt | 4 | 332 |
| 17. | Irregular (lenticular) and thin (7.5 to 46 cm) interbedding of sandstone as in unit 16 and siltstone generally as in the upper 23 m of unit 11 but mostly carbonaceous to coaly | 4 | 328 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| 16. | Sandstone, mottled whitish grey, light grey, and dark grey, weathers mottled dull grey and dull brown, fairly quartzose (est. 70 to 80 per cent) but contains some 3 to 5 per cent of orange limonite grains, 10 to 25 per cent of black coal grains and some kaolinized feldspar and chert grains; predominantly fine grained but poorly to very poorly rounded (subangular to angular grains are prevalent) and sorted as to the grain size; mostly contains a minor to major admixture of medium to coarse, angular grains and grit particles built mostly of quartz but including also kaolinized feldspar, chert, and coal; contains scattered small quartz and chert pebbles (0.3 to 1.3 cm) and 2.5 to 5 cm pods and lenses of medium to coarse grained, gritty, and fine pebbly sandstone; fairly rich in worm burrows for the most part and completely bioturbated in places; massive-looking to very indistinctly and irregularly (corrugated to knotty) bedded, hard and dense but neither quartzite-like nor true quartzite for the most part; has some interstitial porosity in places; strikes (regular) 345° and dips 26°W and is not disturbed otherwise; upper contact abrupt and uneven | 0.5 | 324 |
| | <u>Lower marine member</u> | | |
| 15. | Siltstone, superficially similar to that of units 7, 9 and 11 and with the same interbeds of harder, very sandy siltstone; contains 1 or 2 lenticular 7.6 to 46 cm interbeds of sandstone as in unit 16 in the upper 3 m; upper contact abrupt and uneven | 5 | 323.5 |
| 14. | Sandstone, as in unit 12; upper contact gradational | 0.5 | 318.5 |
| 13. | Siltstone, like harder and very sandy variety of unit 6; upper contact gradational | 5 | 318 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 12. | Sandstone, mottled whitish to light or dull grey, very fine grained, quartzose but with 3 to 5 per cent (est.) of dark mineral grains (?chert) and 3 to 5 per cent (est.) of orange limonite grains (?decomposed glauconite); moderatley well rounded (most grains subrounded) and sorted as to the grain size; hard and dense but not even quartzite-like in texture (some interstitial porosity); strongly bioturbated and consequently indistinctly and very irregularly (corrugatedly to knotty-like) bedded; strike (regular) 345°, dip 25°W and is not disturbed otherwise; upper contact gradational; | 2 | 313 |
| 11. | Siltstone, much as in units 7 and 9 and with interbeds of the same, harder and sandier siltstone; in the upper 23 m becomes fissile to laminated and less sandy; forms a broad, gentle saddle across the traversed ridge; upper contact gradational | 46 | 311 |
| 10. | Sandstone as in unit 8 and in the interbeds of unit 6 but locally strongly bioturbated and rich in worm burrows, including those of segmented Nereites -like types; thinly (2.5 to 7.5 cm) but indistinctly and irregularly conchoidally to corrugatedly bedded; commonly weathers dull to bright-orange instead of dull brown-grey; forms a 3 to 4 m high, sharp-crested hogsback across the traversed ridge; regular strike 340°; regular dip 25°W and not disturbed otherwise; upper contact gradational | 5 | 265 |
| 9. | Siltstone, generally as in unit 7 but includes sandier and harder varieties; stronger bioturbated and carries numerous worm burrows, including those of bent, segmented (i.e. Nereites -like) type; upper contact gradational; regular strike 360° and dip 25°W; forms a slight saddle across the traversed ridge | 21 | 260 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| 8. | Sandstone as in interbeds of the unit 6; contains rare 6 to 13 mm scattered pebbles; regular strike 360° and dip 25° W; upper contact gradational; forms a narrow, rounded hogsback across the traversed ridge | 6 | 239 |
| 7. | Siltstone, lithologically similar to that of units 3 and 5 but mostly more sandy and with several 0.9 to 1.5 m interbeds of very sandy, moderately hard siltstone as in unit 6; contains several irregularly spaced rows of concretions of hard, dull brown grey, orange-to wine-red weathering, true clay ironstone; rocks are closely jointed and cut by stringers and veinlets of quartz locally; some slickensided rock fragments seen in the scree; upper contact gradational | 56 | 233 |
| 6. | Irregular, thin (15 to 46 cm) interbedding of siltstone as in units 3 and 5 with moderately hard, very sandy, dull to ash-grey and fine to medium rubbly weathering siltstone and superficially similar, very silty, very fine grained sandstone; both rock varieties are massive-looking to very indistinctly and corrugated bedded; all contacts between the component interbeds appear to be gradational; some ferruginous sandstone or siltstone as in unit 4; forms a broad rounded hogsback across the traversed ridge; upper contact gradational | 15 | 177 |
| 5. | Siltstone as in unit 3; forms a slight saddle across the traversed ridge; upper contact gradational | 18 | 162 |
| 4. | Sandstone, dull brown grey, weathers same with rust and light brown specks and spots, very fine grained, silty, apparently quartzose, moderately hard, dense but not quartzite-like (some interstitial porosity in most beds); well and thinly to very thinly (1.3 to 15 cm) bedded and laminated within the individual beds; intensively crossbedded and ripple marked on medium to | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|----------------------------|--|--|------------|
| | | Unit | Above base |
| | large scale; contains some 7.6 to 30.5 cm interbeds of siltstone as in unit 3 and of strongly ferruginous, orange- to chocolate-weathering, very fine grained sandstone or superficially similar very sandy siltstone; weathering-resistant and forms a small (1.2 to 1.5 m) but sharpcrested hogsback across the traversed ridge, regular strike 360° and dip 27°W and apparently undisturbed otherwise; exhibits worm burrows and hieroglyphic markings on some bedding planes; very poor in fossils, only some Inoceramus sp. indet., indeterminate ?marine pelecypods (no Buchia) and ? Dentalium sp. indet. having been collected as GSC loc. 92201 from the locally derived fragments; upper contact gradational ... | 3 | 144 |
| 3. | Siltstone, black, weathers same and fine rubbly to flaky, friable and weathers recessively, feebly to moderately sandy; grades upward into unit 4; base covered at the bottom of a long, rubble covered slope of unit 2; visible | 19 | 141 |
| 2. | Completely covered by sandstone blocks, slabs and rubble of unit 1 on the steeply westward inclined, about 245 m long slope; the slope apparently conceals the normal contact between Husky and Bug Creek formations; assumed thickness of concealed rocks | 107 | 122 |
| <u>Bug Creek Formation</u> | | | |
| 1. | Sandstone, white to cream-coloured when fresh, weathers light grey to dirty white with black and orange specks, fine to more rarely medium grained; mostly orthoquartzitic but also includes some quartzose sandstone with admixture of dark mineral, coal and silt grains; generally moderately to well rounded and sorted according to the grain size; predominantly hard to very hard and dense with no visible porosity; medium to thick and indistinctly bedded; weathering-resistant and weathers large blocky and slabby 0.3 to 0.9 m to a side; outcrops are poor and limited to the crest of above mentioned ridge; no fossils seen; upper contact covered; base not reached; visible (approx.) | 15 | 15 |

Section No. 8
(Section JA-F75-16)

Measured on rocky ridges adjoining the principal peak of Mount Millen from the west; base approximately at lat. 67°28'00"N; and long. 136°28'00"W and 1.6 km of the top of Mount Millen; top approximately at lat. 67°28'00"N; and long. 136°31'00"W and 4.4 km west of the top of Mount Millen. Section measured upward but rearranged to read downward.

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | <u>Marine equivalent of Coal- bearing division</u> | | |
| 40. | Interbedding of siltstones generally as in unit 37 but generally speaking more weathering-resistant; forms the top part of northeastern slope and the crest of a high mesa-like mound on the southern bank of a nameless eastern confluent of Bell River; harder siltstone varieties mostly rich in long-ranging marine pelecypods including Arctica (s. lato) sp. indet., Tancredia sp. indet., Mya (s. lato) sp. indet., Pleuromya sp. indet.; GSC loc. 92969 collected at 40-41 m level; attitude as in bed 37; top not reached at mound's top (covered); visible | 60 (approx.) | 1154.5 |
| 39. | Same siltstone as in unit 38, etc. but interbedded with considerable but always subordinate (15 to 25 per cent of thickness) interbeds of harder, feebly sandy, bioturbated siltstone and very sandy, flinty siltstone as in unit 37 and underlying units; contains rare marine pelecypods representing the same shallow water marine fauna as in underlying beds; these pelecypods are mostly restricted to harder siltstone varieties (no Buchia or cephalopods seen; no collection made); outcrops mostly poor on the northern side of previously mentioned mound; upper contact gradational | 35 (est.) | 1094.5 |
| 38. | Siltstone, dark grey, generally as in underlying units beginning with beds 1, 3, etc.; weathers conchoidally and fine rubbly to chippy and recessively; rare clay ironstone concretions as in underlying beds; no fossils seen; upper contact gradational | 19.5 | 1059.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| 37. | Siltstone as in unit 36, commonly grades into very fine grained, silty (greywacke-like) sandstone; the unit continues downslope (westward) for about 200 m and is exposed in the lower part of northern slope of above mentioned mound at the end of this interval; section transferred to this mound; strike (regular) 340°; dip (regular) 20°W; locally contains the same long-ranging marine pelecypods as in underlying beds (GSC. loc. 92946 collected 4 to 5 m below top); both contacts poorly exposed but appear to be sharp and uneven (?erosional) | 11 | 1040 |
| 36. | Cyclical interbedding of above described (i.e. 77-85 m level in unit 35) dark grey, mostly pure siltstone and hard, flinty, very sandy siltstone in laminae, thin layers (1.3 to 5.0 cm) and thin to medium (5 to 60 cm) beds; hard siltstone is crossbedded and ripple marked; soles bear numerous worm burrows; softer, friable siltstone is either fissile or heavily bioturbated and worm burrowed and consequently indistinctly and unevenly bedded for the most part; only a few poorly preserved, marine pelecypods seen (no collection made); attitude as in underlying beds until the level 47 to 49 m where the rocks are bent into an about 18 m wide, open anticline complicated by minor faults; higher up the attitude as before; lower contact gradational | 56 (approx. because of anticline) | 1029 |
| 35. | Siltstone generally as in unit 33; forms a rounded low hogsback across the traversed slope; much less weathering-resistant than that of unit 33 because of the presence of numerous laminae, 2.5 to 7.6 cm layers, and 15 to 30 cm interbeds of dark grey siltstone as in units 29 and 31; strike (regular) 360°; dip (regular) 35°W in basal beds; higher upsection dips lessen to 20-25°; long-ranging marine pelecypods as in other units occur at several levels; collection | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | GSC loc. 92953 made at 50 m level from a 30 to 45 cm interbed of richly fossiliferous, rust-weathering, strongly ferruginous, very sandy siltstone grading into very fine grained silty sandstone includes: Pecten (Camptonectes) sp. indet. | 85 | 973 |
| 34. | Interbedding of two siltstones as in bed 32; attitude as last; both contacts gradational | 4.5 | 888 |
| | <u>Blue-grey shale division</u> | | |
| 33. | Siltstone, uniformly black in fresh and weathered state, strongly fissile and weathers needle to pencil-like, pure, moderately hard; includes several 20 to 25 cm thick concretions, pods and lenticular up to 30.5 cm thick and 3 m long interbeds of crossbedded and ripple marked, hard, rust- to orange-weathering clay ironstone; in basal 8 m strike is 325° and dip 25°W; higher upsection dips steepen to 40° and then become near vertical at 16 m level where rocks become contorted; a strong northwest-trending ?normal fault cuts into the unit at this level; still higher upsection at 20 m level dips lessen to 50°W and strike becomes regular 340°; the unit occupies the uppermost part of steep westward-inclined slope of the ridge traversed; visible (the thickness appears to be reduced considerably by the above mentioned fault) | 34.5 (ass.) | 883.5 |
| | <u>Husky Formation</u> (Arenaceous facies) | | |
| | <u>Upper marine member</u> | | |
| 32. | Siltstone, generally as the light grey, buff weathering, sandy variety of units 30 and 31 but almost devoid of interbeds of any other rocks; thinly bedded to laminated (0.6 to 10 cm) for the most part but includes some 30 to 90 cm interbeds of massive siltstone; extremely | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | strongly crossbedded and ripple marked; includes some interbeds of superficially similar, very fine grained, silty, strongly silicified (flinty), quartzose sandstone; weathering-resistant and weathers fine to medium slabby; forms an 3 to 3.3 m high bluff at the crest of high, sharp cross ridge traversed; unfossiliferous, except for a few marine pelecypods found in place 6 metres above base; this fauna includes Buchia fischeriana (d'Orb.) (GSC loc. 92952); strikes 200° and dips 20° west and is not disturbed otherwise; appears to grade into unit 31 through a 1-2 m thick beds of siltstone similar to the siltstone of unit 31) | 13 | 839 |
| 31. | Irregular interbedding of grey, buff-weathering siltstone as in the topmost part of the underlying bed 30 (locally grading into very fine grained, superficially similar sandstone) with dark grey to black, fissile, flaky to chippy-weathering, hard (flinty), sandy siltstone; the latter siltstone is laminated, crossbedded and ripple marked as the grey, buff-weathering siltstone of bed 30; some interbeds of siltstone as in beds 29 and 27; all siltstone varieties form beds from 8 cm to 60 cm thick and apparently lenticular; all boundaries abrupt, sharp, and uneven with rounded and angular fragments of dark grey to black siltstone incorporated (ripped up) into the overlying grey, buff-weathering siltstone; rare marine fossils collected in basal 0.5 m from grey, buff-weathering siltstone interbeds include Buchia cf. piochii (Gabb) s. lato and forms transitional between B. piochii and B. fischeriana (d'Orb.) s. str. (GSC loc. 92951) | 10.5 (approx.) | 826 |
| 30. | Siltstone as in unit 28; contorted and intensively slickensided in part; grades upward into unit 31 through appearance and gradual increase of ratio and thickness (from 5 to 15 cm) of siltstone, light grey, buff-weathering, hard (flinty), sandy to very sandy; this siltstone is laminated, | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | crossbedded, and ripple marked on a medium to large scale (15 to 60 cm between crests) and interference rippled throughout; the contacts with underlying beds of multicoloured, laminated siltstone are abrupt, uneven, and mostly covered by various worm trails and burrows; rounded pieces (soft sediment rip up) of the dark grey, laminated, multicoloured siltstone are locally incorporated into the overlying grey, buff-weathering, sandy siltstone; general attitude as in underlying beds | 46.5 | 815.5 |
| 29. | Siltstone, uniformly black in fresh and weathered state, strongly fissile and weathers needle-like, pure, moderately hard and grades upwards into unit 30 | 13.5 | 769.0 |
| 28. | Siltstone, laminated and multicoloured, with 0.15 to 0.30 cm dull brown, light brown, and dark grey lamellae alternating cyclically; moderately hard and weathering-resistant; weathers chippy; forms a series of benches across the middle, steep part of the eastern slope of traversed cross ridge; mostly pure but with some laminae and 2.5 to 10 cm interbeds of buff coloured sandy siltstone intensively cross bedded (probably current ripple marked) on a small scale; all laminae are sharply delimited at the top and base but do not exhibit any graded bedding or sole markings; some small 2.5 to 7.5 cm, rounded concretions of rust-weathering, hard, clay ironstone occur locally; no fossils seen; at 50-52.5 m above base the rocks are contorted on a small scale (?consedimentary slumping), otherwise they strike 320° and dip 20° west; upper contact gradational | 60 | 755.5 |
| 27. | Siltstone, closely similar to that of beds 1 and 3 but includes some interbeds of siltstone as in unit 26; outcrops poor and intermittent on the lowermost, gentle part of the above mentioned slope; no fossils seen; both contacts covered | 20 | 695.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-----------------------------|--|--|------------|
| | | Unit | Above base |
| 26. | Siltstone, light grey when fresh, weathers same colour or buff-coloured with orange, ferruginous specks, hard and dense, sandy, apparently massive but outcrops are poor and only weathered rock seen; both contacts covered | 3 | 675.5 |
| <u>Mount Millen Member</u> | | | |
| <u>Upper nonmarine unit</u> | | | |
| 25. | Sandstone dull grey when fresh, weathers brownish grey to ash grey, mostly medium to coarse grained, gritty and fine pebbly but includes some interbeds of very fine grained, silty, carbonaceous to coaly sandstone; friable and weathers fine rubbly to chippy and recessively; rounding of grains mostly poor; sorting of grains according to the size invariably poor to very poor with even the fine grained, silty varieties containing an admixture of coarse grains and grit- to fine pebble-sized clasts; bedding appears to be thin but extremely irregular (conchoidal to corrugated) with layers of light grey, quartzose to orthoquartzitic sandstone alternating with those of dull grey, lithic and cherty sandstone; outcrops extremely poor and intermittent which precluded the working out of the ratios of individual rock types; no attitude; both contacts covered | 6 (appr.) | 672.5 |
| 24. | Almost completely covered in the middle of a broad flat zone underlain by units 19 to 26 and forming a terrace-like part of traversed ridge; probably is underlain by the same siltstone and/or sandstone as in beds 25 and 26 | 4.5 (assum.) | 666.5 |
| 23. | Sandstone, light brownish grey or mottled beige and light grey when fresh, weathers mottled dirty white, light grey and light brown, mostly medium to coarse grained, gritty and fine pebbly but includes several 7.5 to 24 cm interbeds of fine to coarse grit with scattered fine to very fine (0.3 to 1.3 cm) almost exclusively angular | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| | pebbles; thin (1.3 to 7.5 cm) to medium (15 to 30 cm) and distinctly bedded; commonly laminated within individual beds; commonly crossbedded on a medium to large scale (15 to 45 cm between crests); moderately hard and dense with a good interstitial porosity; all grains and clasts are extremely poorly rounded with angular to subangular grains and clasts prevalent; they are also invariably poorly sorted as to the grain size; poor in cement and commonly vuggy; always quartzose to orthoquartzitic and poor in chert grains and clasts; invariably contains numerous angular grains and clasts of deeply weathered, ?kaolinized white ?feldspar; outcrops poor and only frostheaved rock was seen; may include considerable interbeds or friable, fine to medium grained sandstone and/or siltstone; both contacts covered; visible | 4.5 | 662 |
| | <u>Intermediate marine unit</u> | | |
| 22. | Siltstone, as in beds 1, 3 etc. but interbedded with a considerable number of 15 to 40 cm beds of sandstone as in unit 9 and with some sandy to very sandy, dull grey, friable siltstone weathering fine rubbly; outcrops are poor and patchy throughout and no detailed succession of beds could have been worked out; Dentalium -like, small tubes and numerous worm trails and burrows; some completely desintegrated but presumably small (10 to 20 cm) clay ironstone concretions; upper contact covered | 9 | 657.5 |
| 21. | A completely covered interval assumed to correspond to the thickness of about 2 m of the section | 2 (ass.) | 648.5 |
| 20. | Very sandy siltstone as in unit 12 but with numerous scattered (7.6 to 30.5 cm) pods and 7.1 to 20 cm thick and up to 5-12 m long lenses of bright red to orange-weathering, strongly ferruginous, very dense and hard | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | siltstone ("clay ironstone") instead of huge concretions of the same characteristic of unit 12; weathering-resistant and forms a 1 to 1.2 m high hogsback at the crest of a gentle, westward-inclined cross slope; attitude (regular) varies from 200°, 20°W to 190°, 10°-15°W; a few poorly preserved, long-ranging marine pelecypods seen at the level 1 to 1.2 m above visible base (no collection made); otherwise only numerous straight and twisted (including segmented <i>Nereites</i> -like) worm burrows and trails occur throughout the unit; rare, scattered, 0.3 to 0.6 cm, poorly rounded chert pebbles occur locally; top and base covered; the bed appears to thin out markedly southward (to as little as 4 to 4.5 m at the end of about 360 m interval over which the section was transferred); visible | 6.5 | 646.5 |
| 19. | Sandstone as in units 6, 8 and 10, underlies a shallow saddle immediately west of the hogsback formed by considerably less resistant southern facies of unit 18; outcrops poor and intermittent and the unit may include some siltstone as in units 1, 3, etc.; both contacts covered | 27 | 640 |
| | <u>Lower nonmarine unit</u> | | |
| 18. | Sandstone, essentially as in unit 16 but mostly darker grey (mottled dark and dull grey) coloured and more carbonaceous than the latter; contains considerable number of 5 to 25 cm bands and similarly thick 6 to 9 m long pods of orange-weathering, ferruginous siltstone ("clay ironstone"), which are rare in unit 16, and weathers commonly dull to bright brown, becomes gradually less and less carbonaceous, and correspondingly lighter grey coloured upward in the sequence; also becomes harder, heavier, and more indistinctly bedded in this direction; however, no definite upward coarsening of sand grain was noted; forms a 3 to 3.6 m high vertical escarpment crowning the steep eastward inclined | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | slope underlain by units 12 to 16; the unit becomes definitely less weathering-resistant southward within about a 1.6 km long interval involved in the transfer of the section along its strike; strikes 360° and dips 35° west (not disturbed otherwise); both contacts covered | 25.5 (approx.) | 613 |
| 17. | Sandstone, similar to that of units 6, 8, and 10 but darker grey coloured and coaly almost throughout; extremely irregularly and indistinctly bedded, strongly bioturbated and commonly rich in worm burrows, including those of segmented, <i>Nereites</i> -like types; otherwise no fossils seen; outcrops very poor and intermittent in the lower 30 m and in the topmost 7 m, therefore the unit may include some siltstone as in units 1, 3, etc. in these intervals; generally friable and forms a recessively-weathering, less steep, upper part of the traversed slope between the escarpments of units 16 and 18; attitude as in unit 16; both contacts covered | 45 (approx.) | 587.5 |
| 16. | Sandstone, generally similar to that of the unit 2 but carbonaceous almost throughout and contains a greater number of variously shaped, 0.3 to 5 cm inclusions of black coaly matter which include some subvertical, rounded black tubes probably representing rootlets of plants; also is less quartzose and contains a greater ratio of coaly and chert (white and black) grains (est. ratio 20 to 25 per cent combined) than the sandstone of the unit 2; there is a definite tendency for the sandstone of the unit 16 to become coarser grained (i.e. from very fine grained below to fine grained above) toward the top and to become enriched in medium and even coarse grains in the topmost few feet; sorting of grains according to the size is only moderately good below and poor above; rounding of grains is moderate to poor throughout, subangular to subrounded grains being prevalent; weathering-resistant and forms a vertical 18-20 m high escarpment across the middle part of the traversed slope, strike (regular) 190°, dip 25°W; upper contact covered | 21 | 542.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 15. | Completely covered by debris, assumed to represent 5 m of the section (approx.) | 5 (ass.) | 521.5 |
| | <u>Lower marine member</u> | | |
| 14. | Interbedding of siltstone as in unit 13 with dark grey, silty sandstone as in units 6 and 18; becomes sandier and sandier upward until the topmost 4 to 5 m exposed consist predominantly of the above mentioned sandstone; top covered; visible | 46 | 516.5 |
| 13. | Siltstone, black, lithologically similar to that of units 1, 3, etc.; includes some orange-weathering 7.6 to 30.4 cm, rounded concretions of clay ironstone; outcrops poor; occupies the lower part of steep, eastward inclined slope underlain by beds 13 and 18 inclusive; both contacts covered | 68 (approx.) | 470.5 |
| 12. | Siltstone superficially similar to the sandstone of unit 9; sandy to very sandy and commonly grading into very fine grained, silty sandstone; contains a row of irregularly rounded 1.5 to 2.4 m concretions of very hard, flinty and at the same time strongly ferruginous siltstone, blue grey when fresh and weathering bright orange; rich fauna of well preserved, mostly still closed to gaping, double valved marine pelecypods contained therein includes: flat, large forms of Buchia (Anaucella) concentrica (Sow.) s. lato, Pleuromya ex gr. vancouverensis (Whiteaves), Goniomya sp., Lima (s. lato) sp., and Modiolus sp. (GSC loc. 92947); strikes 360° and dips 25°W; weathering-resistant and forms an 2.4 to 3 m, sharp-crested hogsback across the slope; lower contact covered and cut off by a strong, approximately 210° to 220° trending, near vertical, normal fault which places the bed 12 immediately against the unit 9 southeast of the line of the section; northwest of the line on northeastern side of the fault some 37 m of rocks lithologically | | |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| | similar to those of units 10 and 11 occur between the top of unit 11 and the base of unit 12; these faulted out beds have not been studied in any detail because of the lack of time; upper contact covered, visible | 7.5 | 402.5 |
| 11. | Siltstone as in units 1 and 3; but includes some interbeds of sandstone as in unit 9; friable, exposures poor; both contacts covered and upper contact is faulted, visible | 49.5 | 395 |
| 10. | Sandstone as in units 6 and 8, friable and poorly exposed; grades upward into unit 11 | 9 | 345.5 |
| 9. | Sandstone, mottled dull brownish grey and medium grey when fresh, weathers buff to dull brown, quartzose but fairly rich in limonite grains, very fine grained and more or less silty; moderately hard and dense with some interstitial porosity at least; thinly (2.5 to 10 cm) but rather irregularly (conchoidally) bedded, locally laminated; crossbedded on a small scale and/or rich in low and broad, sharp- to round-crested, large to medium-sized (15 to 45 cm between crests) ripple marks; locally strongly burrowed by round, 0.15 to 2.5 cm, straight to twisted worm burrows (including segmented <i>Nereites</i> -like burrows); contains 5 to 45 cm thick and up to 6 m long, lenticular beds and lenses of orange-weathering, strongly ferruginous sandstone; weathering resistant and forms a sharp-crested hogsback across the traversed ridge; strikes 220° and dips 40°W; no fossils seen; contains considerable interbeds of sandstone as in units 6 and 8 and may be almost entirely replaced by these sandstones locally, in which case the unit loses its ridge-forming character and becomes quite similar to units 8 and 10; grades upward into unit 10 | 18 | 336.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|--|--|------------|
| | | Unit | Above base |
| 8. | Sandstone as in unit 6; occupies the western side of the previously mentioned depression and most of the eastern slope of the next following hogsback crested by unit 9; exposures poor and mostly only desintegrated rock was seen; grades upward into unit 9 | 14.5 | 318.5 |
| 7. | Siltstone as in units 1, 3, etc. but includes at least two beds of sandstone lithologically similar to that of unit 6; the lower bed is 0.3 m thick and occurs at 12.0 to 12.3 m level; the upper bed is 0.5 m thick and occurs at 25.5-26 m level; another 10 to 20 cm interbed of strongly ferruginous, orange-weathering, fine to very fine grained, quartzose sandstone occurs at 31.5 m level and yet another 60 cm thick interbed of sandstone exactly as in unit 6 occurs at 32.5 to 33.1 m level; a lot of Buchia (Anaucella) concentrica (Sow.) s. lato fauna (GSC loc. 92946) was collected from the second (25.5-26 m level) sandstone; grades upward into unit 8 | 49.5 | 304 |
| 6. | Sandstone, mottled dark grey to black when fresh, weathers brownish grey and fine rubbly to chippy, friable and occupies the flat bottom of a wide and shallow depression occurring next west of of the hogsback occupied by units 4 and 5; mostly massive-looking to very indistinctly and irregularly bedded but may be laminated and crossbedded on a small scale locally; fine to very fine grained, quartzose but with a considerable admixture of silt-size, coaly grains; contains small coaly inclusions locally, strongly bioturbated and locally contains many worm burrows of several kinds; becomes gradually siltier and siltier upward and so grades into the unit 7; well preserved fauna of Buchia (Anaucella) concentrica (Sow.) s. lato (GSC loc. 92944) was collected from fresh, locally derived float at the level 15 m above visible base | 27 (approx.) | 254.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|-------------------|---|--|------------|
| | | Unit | Above base |
| 5. | Almost completely covered by debris on the western slope of the traversed hogsback (see below); judging by some scattered, small patches of decomposed rock, probably underlain by the same sandstone as in the unit 4 but interfingered with several 0.3 to 1.5 m thick units of friable, blue grey, very fine grained, coaly sandstone and dark grey, flaky to fine rubbly weathering, sandy siltstone; at the top strikes 200° and dips 35°W; no fossils seen; both contacts covered | 11 (approx.) | 227.5 |
| 4. | Sandstone, similar to that of the unit 2 in the basal 4.6-5.5 m, except in the presence of considerable 8 to 20 cm interbeds and lenses of bright-orange to chocolate-weathering, ferruginous, fine grained sandstone; very rich in limonite grains (up to 25-30 per cent est.) possibly representing decomposed glauconite; thinly bedded (5 to 20 cm), crossbedded and ripple marked on a small to medium scale; the sandstone is commonly vuggy, the cavities being lined by fine to very fine, quartz crystals; higher up ferruginous interbeds disappear and the sandstone becomes dirty white, ortho-quartzitic or only feebly carbonaceous; thick to heavily (0.3 to 0.9 m) and indistinctly bedded or massive looking, weathering large blocky or slabby; this weathering-resistant sandstone forms the crest of a pronounced hogsback across the traversed, westward-inclined slope of the ridge; strikes 180° and dips 25°W; Buchia (Anaucella) concentrica (Sow.) s. lato (GSC loc. 92943) occurs in place at the level 2 m above visible base; both contacts covered | 51 (approx.) | 216.5 |
| 3. | Siltstone, as in unit 1; exposures poor and only deeply weathered to completely decomposed rock seen; mainly occupies the flat bottom of the deep depression separating the hogsbacks of units 4 and 2; no fossils seen; both contacts covered; visible | 30 (approx.) | 165.5 |

| Bed or Unit | Description | Thickness (rounded to the closest half metre) | |
|--|--|--|------------|
| | | Unit | Above base |
| <u>Porcupine River Sandstone (tongue)</u> | | | |
| 2. | Sandstone, mottled dark and light grey when fresh, weathers same or dull grey with rusty spots and specks, fine grained, quartzose but with a considerable admixture (est. 10 to 15 per cent) of white and black, probably largely chert, grains (possibly including some feldspar and coal grains as well), moderately to poorly rounded (subangular to subrounded grains predominate) but well sorted as to the grains' size (neither coarse to medium grains nor silt-size grains noted); contains some scattered, black, coaly grains and a considerable number of 0.6 to 5 cm, irregularly shaped inclusions of black, coaly matter; moderately hard and dense and with a fair to poor interstitial porosity; medium (10 to 30 cm), indistinctly and unevenly bedded (mostly conchoidally to corrugated bedded); only traces of fossils found in the basal 21.5 m but some representatives of the early form of Buchia (Anaucella) concentrica (Sow.) of an upper Oxfordian age (GSC loc. 92942) were collected in place at the latter level; sandstone is weathering-resistant and forms a round-topped, low hogsback across the traversed ridge, outcrops are mostly poor and intermittent with considerable intervals completely covered by sandstone rubble; hardly any definite outcrops seen above 75 m level; the debris-covered interval 70-122 m forming the moderately steep western slope of the above mentioned hogsback could possibly be underlain by siltstone of unit 3 instead of the sandstone of unit 2; upper contact covered, thickness (assumed in part) | 122 (ass.) | 135.5 |
| <u>Equivalent of Lower argillaceous member</u> | | | |
| 1. | Siltstone, brownish grey in deeply weathered to completely decomposed state; no fresh rock seen; outcrops poor and intermittent; most of the interval being covered by blocks and slabs of the sandstone derived from the 150 to 180 m high ridge of the Bug Creek Fm. adjoining the deep saddle occupied by the unit 1 from the east; no fossils seen; contact with the underlying Bug Creek sandstone covered; upper contact covered; visible | 13.5 | 13.5 |