CX - OYSTER RIVER 64(1)A

THE GEOLOGY OF OYSTER RIVER

M&MEDRAWG

EXCERPT-1964

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CK-OYSTER RIVER 64(1)A

OPEN FILE

June 1, 1976

Dr. J. Muller,
Geological Survey of Canada,
6th Floor, 100 W. Pender Street,
Vancouver, B.C.

Dear Dr. Muller,

Thank you very much for your help and information, including the loan of M. Medding's paper, which is enclosed. We very much appreciate access to your field maps, as an alternative geological interpretation will be of great value in assessing the coal reserves of the Comox Basin.

We regret that, due to circumstances beyond our control, we have been transferred to the Peace River - Monkman Pass Coal Project to do regional mapping, and hence will be unable to further our work on the Comox Basin at this time. However, we have catalogued the plans and reports currently in our possession and we understand that the Provincial Museum and Archives Staff (Messrs. Don Gallagher (curator), Jeff Castle (maps and Mike Halleran (reprints-files) are presently sifting through the Buckham Collection.

We have deposited our files and accumulated information with our Coal Geologist, Bob (R.D.) Gilchrist at 626 Superior St., Victoria (387-5068). Should you have any need of the Canadian Collieries borehole data or mine plans that you forwarded to us, please do hot hesitate to contact him.

Thank you very much again!

Yours sincerely,

R.D. & M.E. McMechan,

RD/cb
Encl.

x.c. R.D. Gilchrist.

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Excerpt from Medding, Monica G, The geology of Oyster River; B.Sc.Thesis, U.B.C., 1964.

GEOLOGY

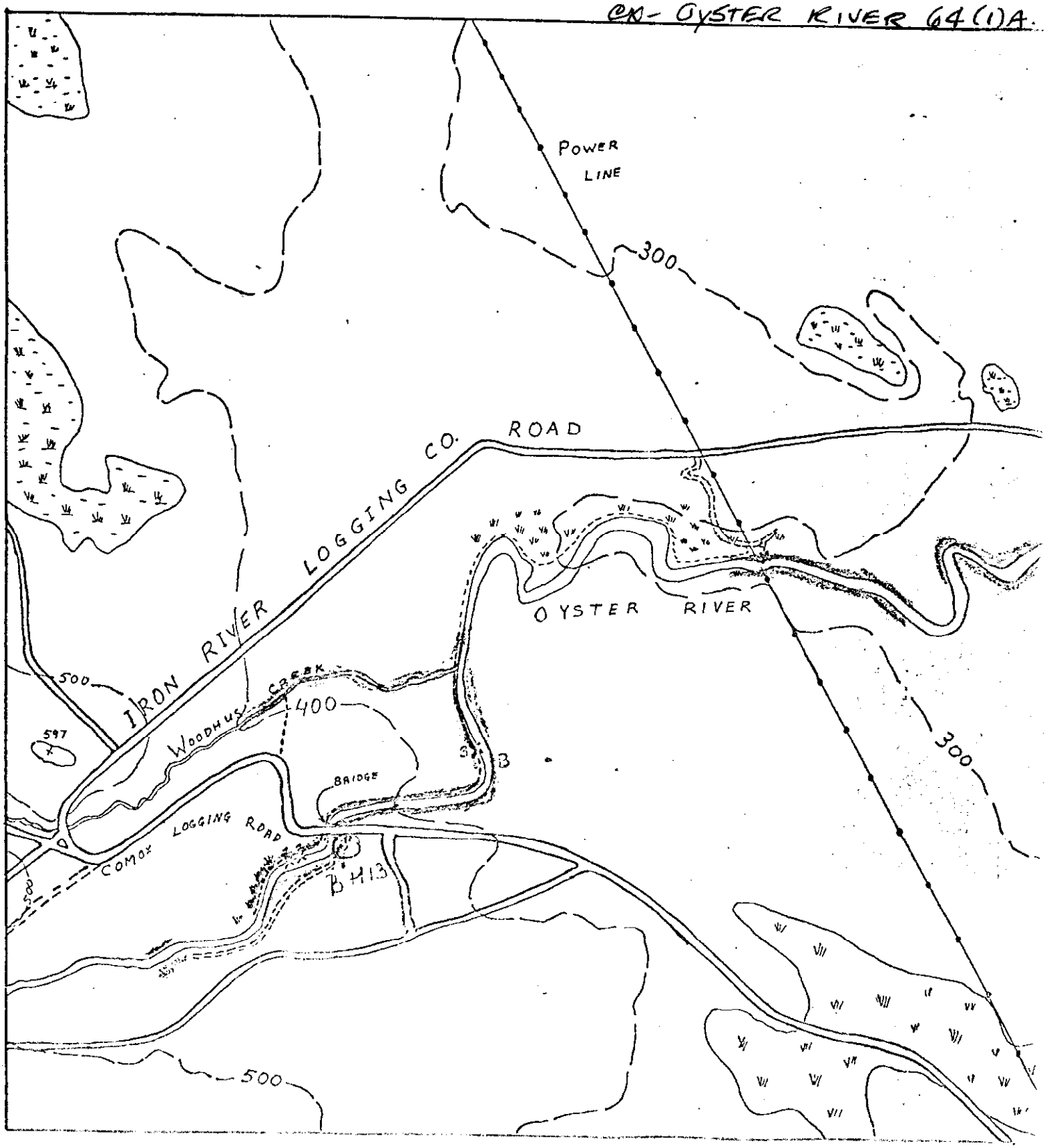
General Geology and Stratigraphy

The section that was measured consists mainly of fine grained sandstone of Upper Cretaceous age. This bedrock is unconformably overlain by glacial outwash sediments or till, as previously mentioned. A section was measured about one quarter mile upstream from the logging bridge, and proceeded downstream for about three miles. River gravel and sand covered the bedrock above and below the section. Where the river flows on bedrock, its banks are generally steep and exposures are good. The sandstone is weathered buff to yellowish on the surface, but is dark grey on the fresh surface. Structurally, the rocks are fairly simple, dipping gently between 8° and 10° towards the coast. Only two faults, both of which were nearly horizontal, were observed. They have a displacement of not more than a few inches and were well marked by slickensided surfaces.

The sandstone is very calcareous, calcite being the predominate cement and matrix. Concretions are numerous, often weathering out into round hard masses from the cliff faces. Other exposures show a honeycomb pattern of solution pits in the cliff faces. In some places, weathering has completely hidden the true bedding. Exfoliation occurs in thin sheets about one inch thick, along the more gently sloping banks of the river. Large blocks of sandstone that have broken off the cliff faces show concentric exfoliation. In several areas, cave-like holes are being enlarged by concave exfoliation into the cliff faces.

Just south of the logging bridge, in a bottle-neck canyon, erosion was initially begun by pot-hole scouring,

(6)


@N- OYSTER RIVER 64(1)A.
POWER LINE
300
IRON RIVER LOGGING CO. ROAD
OYSTER RIVER
500
400
300
500
597
WOODHUS CREEK
BRIDGE
3
B
COMOX LOGGING ROAD
BH13
500

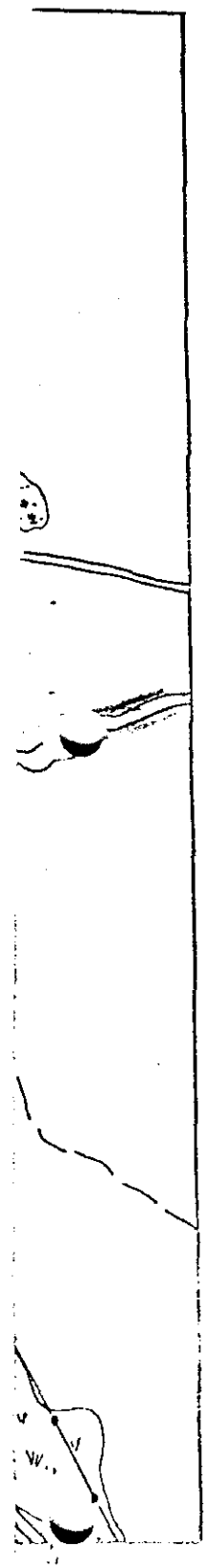
CX – OYSTER RIVER 64(2)A

(5)

Plate II

GEOLOGY OF THE OYSTER RIVER

LEGEND



- Power Line
- Logging Road
- Vehicle Trail
- Foot Trail
- Marsh
- Known Extent of Cretaceous Rocks
- Probable Extent of Cretaceous Rocks
- × Fossil Zone

ONE MILE

probably below some previously-existing rapids or falls. These pot-holes are now enlarged so that they join one another. Numerous flat-topped table-like remnants of sandstone jut out of the middle of the stream, many of which are still connected by natural bridges.

In general, the river flows approximately at right angles to the strike and in the direction of the dip of the Cretaceous sandstone. At two particular locations (locations A and B on map 3) however, it makes a right angle turn to the north and flows along the strike for some distance before turning along the dip again. It is at these points that the maximum outcrops of Cretaceous rocks occur. In the first turn, the river has cut a canyon approximately one hundred and thirty feet wide and seventy feet deep. The west wall slopes about 60° whereas the east wall is practically vertical. The second turn, about one-half mile down river, again has a nearly vertical east wall, about eighty feet high and a very gently sloping west bank of about 20°. In both cases, the deepest channels are at the base of the east walls, where the main part of the river flows, and are probably examples of homoclinal shifting.

Detailed Description of Section

Measurement was begun about one quarter mile west of the logging bridge.

Bottom of Section

Feet	Remarks
0 - 9	Sandstone, thin platy, fine-grained, ferruginous staining, containing some carbonaceous films; surface shows manganese stains; vertical joint cuts bedding striking at N 41°W, no apparent displacement of beds. Dip - 10° to east, strike - N 11°W.
9 - 12	Sandstone, medium grained, containing carbon films of stems and leaves, poorly preserved.
12 - 26	Sandstone, coarse-grained grading to medium-grained, bedding up to one foot thick, outlined by an occasional row of small pebbles. Dip - 9° to east, strike - N 8° W.
26 - 33	Sandstone, fine grained. Fossil Zone #1 Tellina, Glycymeris, Protodenax, Actinoceramus, Nucula, Gyrodes. Some original shell material left.
33 - 39	Sandstone, fine grained, hard.
39	Sandstone, fine grained. Fossil Zone #2 Contains the same fossils as #1, as well as fragments of Inoceramus prisms.
	Fossil beds cut by two horizontal, parallel faults, striking 314°, and dipping 8° to the west; displacement not more than two to three inches, marked by slicken sides.
39 - 50	Sandstone, fine grained, silty, thinly bedded, ferruginous, concretionary. Single specimen of an ammonite was seen jutting from roof of cavern (was not collected). Strike N 15°W, dip 8.5° to east.
50 - 52	Sandstone, coarse grained, containing rows of pebbles. Evidence of poorly preserved fossil shells.

Feet	Remarks
52 - 76	Sandstone, coarse grained, with stems and leaves of plants, and Inoceramus fragments of fibrous aragonite crystals.
76 - 96	Sandstone, fine to medium grained, calcareous, concretionary, and showing weathering by exfoliation.
96 - 153	Sandstone, fine to medium grained, thickly bedded; some plant remains in stringers of silty sandstone; calcareous, concretionary.
153 - 192	Sandstone, fine to coarse grained, the more calcareous, concretionary beds susceptible to erosion, leaving prominent ledges.
192 - 197	Shale, black, platy, thinly bedded; contains leaf imprints which were not identifiable.
197 - 265	Sandstone, medium to coarse grained, thickly bedded; shows large scale crossbedding at 21° to true bedding; numerous fragments of petrified stems and branches - identified as species of Cedroxylon (cedar).
265 - 313	Sandstone, medium to coarse grained, thickly bedded.
313 - 365	Mostly covered interval; river sand and gravel; occasional small exposures of sandstone.
365 - 429	Sandstone, medium grained, thickly bedded; some petrified wood remains; grades to fine grained sandstone towards the top.
429 - 430	Shale, black, thinly bedded.
430 - 442	Sandstone, fine grained; contains a few casts of pelecypod shells, possibly of Tellina.
442 - 444	Sandstone, fine grained. Fossil Zone #3 Trigonocallista, Inoceramus, Acila, Volutoderma, Cyrodes, Cerithium, Glycymeris, Many fossils, particularly the gastropods preserved only as casts and molds in the highly weathered parts; some fossils partially replaced by pyrite.
444 - 467	Covered interval represented by distance across river at second turn; appears to be made up of sandstone in river bed.

Feet	
467 - 489	Shale, interbedded with sandstone; shale is dark grey, thinly bedded. Sandstone is unfossiliferous, fine grained and contains casts of Tellina and Acila demessa.
489 - 514	Sandstone, medium grained, massive, thickly bedded.

Top of measured section.

From this point to the power line, one mile downstream, no bedrock was exposed. Using a dip of eight degrees, which is the average dip of the beds at both ends of the outcrops, a thickness of approximately four hundred feet of bedrock is represented by this interval, provided that there are no faults or folds.

At Power Line

Base of section

Feet	Remarks
914 - 934	Sandstone, fine to medium grained, calcareous, concretionary, medium to thinly bedded. Fossil Zone #4 Tellina, Inoceramus, Acila, Didymoceras, as well as petrified wood and leaf imprints.
934 - 1024	Sandstone, medium to coarse grained, bedding often outlined by rows of pebbles; contains petrified wood fragments.

Top of section

Petrology

Thin sections were made of a representative sample of sandstone from each of the fossil zones.

Zone #1

Consists of quartz, 40 to 45%, grains are sharp and angular, showing conchoidal fracturing, and with many inclusions. Plagioclase is present as small angular grains; larger grains show better rounding. Carlsbad and Albite twinning present, some grains were fractured after deposition, these fractures later filled in with calcite, about 25%. Minor amounts of hornblende, volcanic fragments, epidote and biotite, all in a calcite matrix.

Zone #2

Fine grained sandstone, quartz grains sharp and angular, many of which are dark with inclusions and bubbles - 55%; plagioclase, as before - 15%; minor amounts of biotite, epidote and volcanic ash. Most of the calcite cement has been dissolved away.

Zone #3

Fine to medium grained sandstone; quartz as in other zones, many fragments showing parallel lines of inclusions, about 60%. Plagioclase present as small grains, some showing alteration and corrosion at the edges, some still attached to quartz grains, indicating their granitic origin, about 15%. Calcite crystals, some angular, some showing corrosion; all cemented by calcite, probably chiefly from dissolved shell material.

Zone 4

Fine grained sandstone. Quartz predominates, about 70%, again sharp and angular as in other zones. Plagioclase, about 20%, sub-angular to sub-rounded. Biotite, about 5%, flakes have ragged edges. Minor amounts of volcanic particles, diabase, apatite, tourmaline, epidote, and chlorite; could be called a marine plagioclase arkose.

From this study, it is evident that the source rocks were chiefly granitic, with a minor source being volcanic rocks. Relief must have been high, because particles, especially quartz, show little abrasion. Easily decomposed plagioclase has also been scarcely altered. Deposition was rapid and probably occurred when the Comox Basin was down-warping as fast as it was being filled.

Correlation

The writer believes that the section studied corresponds to the upper part of the Comox Formation, or to the lower part of the Trent River Formation. While lithologies of these are somewhat different, the section probably represents a continuous but gradational part of either or both of the above named formations, varying in lithology due to the difference in the depth of the basin from Oyster River to Comox. However faulting or slight folding may be present in the intervening distance, in which case the comparison could be a false one.

CONCLUSION

The writer examined an area of Upper Cretaceous strata exposed on the Oyster River on Vancouver Island. The strata consists mainly of calcareous sandstone with several small beds of shale, and the sequence can probably be correlated to the Trent River Formation or to the upper part of the Comox Formation in the Comox Basin. Total thickness exceeds 1000 feet. The sediments represent a warm shallow marine environment, probably deltaic, as is suggested by the presence of large scale cross-bedding. Evidence of land plants at several horizons indicates that the level of the land was fluctuating relative to sea level. Fragments of petrified cedar suggest that surrounding uplands had a cool, moist climate during Upper Cretaceous times.

The most abundant type of marine life found was pelecypods, particularly Nucula, Inoceramus, Trigonocallista, and Tellina. Many of the specimens are the same as those found on Hornby Island by Hoen (1958) and they are also similar to the Upper Cretaceous fossils found on the Queen Charlotte Islands and in California. Several pelecypods could not be identified.

More extensive work on the Upper Cretaceous fauna in British Columbia is necessary in order to make proper identification of all the fossils and so to provide better correlation of formations. A compilation of all Cretaceous fauna and flora found on the west coast of North America would be very useful.

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The following fossils are described:

Gyrodes sp. indet.
Volutoderma californica
Cerithium skiddegatense
Didymoceras hornbyense
Didymoceras sp.indet. (A)
Didymoceras sp.indet. (B)
Nucula sp.indet.
Acila demessa
Tellina skiddegatensis
Tellina sp.indet.
Protodonax sp.indet.
Inoceramus duplicostatus
Inoceramus glennensis
Inoceramus sp.indet. (A)
Inoceramus sp.indet (B)
Actinoceramus sulcatus
Trigonocallista major
Glycymoris shastensis
Cedroxylon sp.indet.

MEMORANDUM RE COAL IN THE VICINITY OF OYSTER RIVER

Sandstone Roof

14"	Coal under
24"	Shale
30"	Coal
24"	Rock Shale
24"	Coal
9"	Rock
8"	Coal
8"	Rock
8"	Coal

Floor Pitching approximately 9" in 29" to North; also Pitching to East. 16°

Located on Caribee Creek, 8 miles from Highway.

Get permission from Hupee to drive up. (See Virgil Staltze.)

62