PLEISTOCENE HISTORY OF THE NEWPORT, OREGON, REGION

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Introduction

The Pleistocene geological history of the Newport region was studied many years ago by Thomas Condon, pioneer geologist of Oregon. Dr. Condon used many of the excellent geologic features as examples in his informal lectures on the geology of the region. J. S. Diller (1896), who made a geological reconnaissance of northwestern Oregon, referred to Condon's unpublished work in his account of the deposits at Newport. Diller showed the section at Nye Beach and at a small cove south of Nye Beach near the present North Jetty. Most of the geologists who published later reports on this region were interested mainly in the earlier Cenozoic strata. The most detailed mapping was done by Vokes, Norbisrath, and Snavely (1949), who summarized the contributions of earlier workers.

The sequence of Late Cenozoic events along the southern Oregon coast was summarized by Baldwin (1945). Relatively unconsolidated sediments that crop out at Nye Beach on either side of the natatorium were correlated by him with sediments of the Coquille formation exposed north of the mouth of the Coquille River. It is the purpose of this paper to place Pleistocene events in the Newport region in the sequence of events that occurred along the Oregon coast and to trace former drainage in the Newport area.

Pleistocene sequence of events

The history of the southern Oregon coast as outlined by Baldwin (1945) is as follows:

1) Formation of high terraces by relative stillstand of sea followed by movement of the strandline. This probably occupied much of lower Pleistocene time as well as part of the Pliocene.

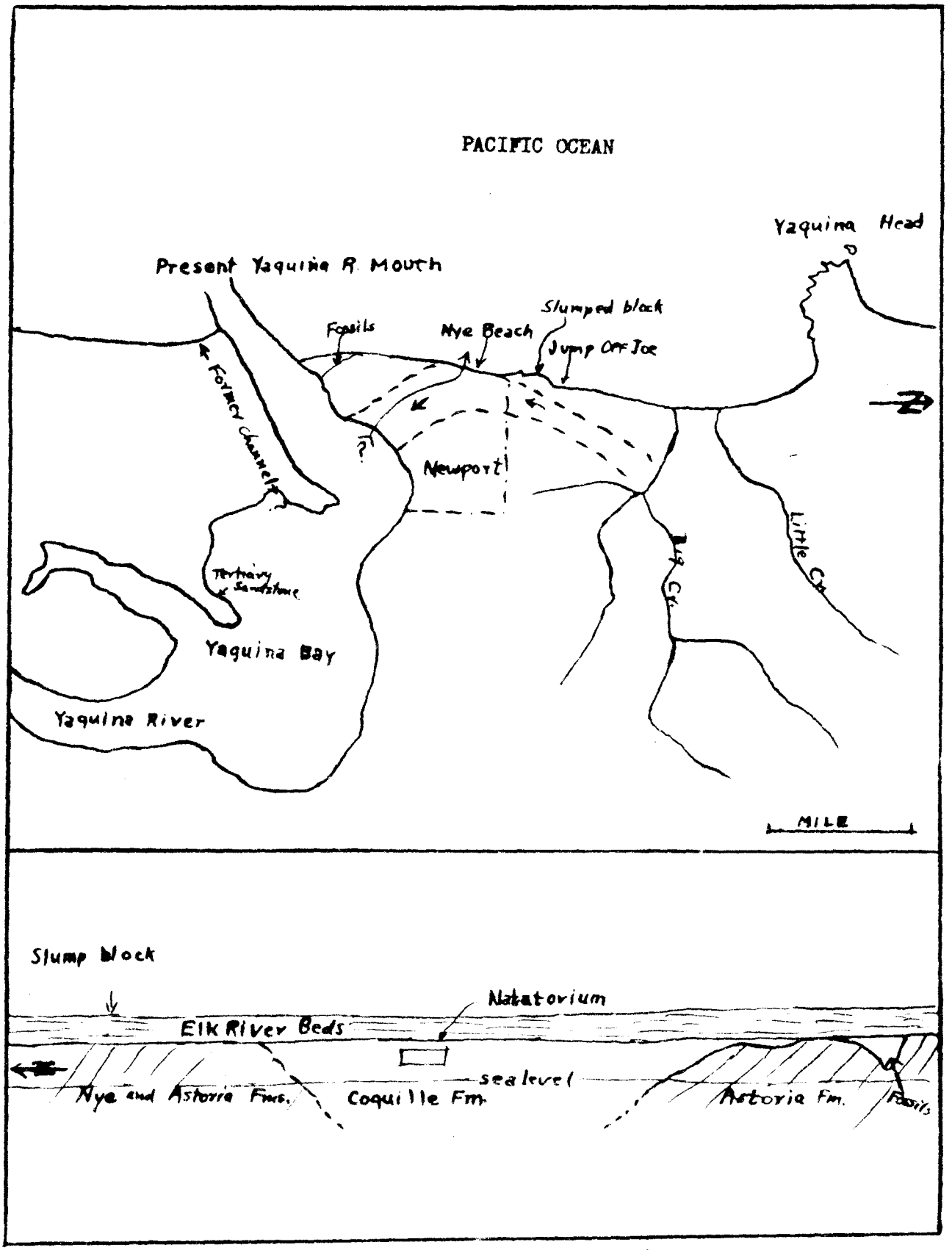
2) Relative uplift of the land to a point approximately 300 feet above present level.

3) Relative submergence to a point several hundred feet above sea level. Evidence points to at least 160 feet of submergence above present sea level, and indirect evidence suggests that as much as 350-400 feet of drowning occurred at the time of deposition of the Coquille formation in the river bay mouths.

4) Relative emergence accompanied by stillstands of the sea and terrace formation. One prominent stillstand formed the prominent terrace seen at Cape Arago and Cape Blanco upon which the Elk River beds rest. Warping occurred during and after the formation of the terrace, and the Elk River beds are significantly thicker in the downwarped areas.

5) Then followed continued withdrawal of the sea (relative emergence of the land) to a point approximately 200-250 feet below present sea level. (This figure is an estimate and it is unknown which is the deeper valley -- that occupied by the Coquille sediments or that occupied by the present bay muds.)

6) Relative submergence and filling by alluvium produced the mud flats and bay that we can see today.



MAP AND CROSS SECTION OF NEWPORT, OREGON, AREA

In the sequence of events, the prominent terrace capped by the Elk River beds is younger than, and truncates, the Coquille formation; but is older than the second stage of downcutting.

Yaquina River drainage

The history of the Yaquina River and its tributaries is in part revealed by the distribution of sediments of the Coquille formation that occupies former valleys. Many of the Oregon rivers have shifted from their former courses, leaving their alluvial-filled valleys. Such shifts in stream mouths have been described by Baldwin (1945) and Snavely (1948).

Coquille sediments are exposed beneath younger Pleistocene sands, both along Nye Beach on either side of the natatorium and along the Yaquina Bay in the lower business district of Newport, indicating a channel through the point beneath Newport. Small remnants of this formation crop out in the beach just north of the mouth of B ig Creek, and in a small cove already mentioned near the north jetty. It would appear at first that the Yaquina River formerly flowed through the vicinity of Nye Beach on its way seaward; but an examination of the beach at low tide shows that reefs of Astoria sandstone nearly close the gap through which the submerged channel would have to pass. It is doubtful if there is room for even a narrow river channel. An alternative would be that a former valley of Big Creek extended southward behind the block of sandstone that is now slumping, paralleled the strand line at Nye Beach, and then turned eastward to join the Yaquina River. This is partially supported by the eastward inclination of the contact between Coquille sediments and older rock at the south end of Nye Beach. In this case, the small patches of Coquille sediments that lie north of Big Creek and by the jetty would lie in small tributaries that flowed eastward into the larger valleys.

The former mouth of the Yaquina River probably lies somewhat south of its present mouth beneath the dune area where evidence is buried. At present, the dunes have been encroaching northward and driving the river against the resistant Astoria sandstone along the north bank.

Lithology of Coquille formation

The sediments of the Coquille formation exposed in the vicinity of Newport are predominantly claystone and muddy sandstone with intercalated fragments of wood, some being quite large stumps and logs, and conglomerate. The beds are indurated enough to stand in low cliffs without appreciable slumping. The conglomerates contain pebbles of rocks common in Yaquina River drainage and a few whose source is not readily recognized. Many of the brilliantly colored rocks and agates that make the beaches of Newport -- famous as collecting grounds -- have been reworked from the Coquille formation.

Marine terraces

The Coquille sediments were truncated by the sea during the formation of several marine terraces along the seaward side and by stream erosion during corresponding stages of terrace formation. The lowest of these marine terraces is capped by friable sands of the Elk River beds which may be traced along the Oregon Coast. It was during erosion of the Coquille fill that the streams assumed their present position where they have incised with lowering base level.

The Elk River terrace has been largely removed by the sea between Jump-Off Joe and Agate Beach The largest remnants occur in the town of Newport itself. Because of the small extent, one might think that it was a slumped part of a

higher terrace. Along Nye Beach the wave-cut platform of the Elk River terrace is approximately 45-50 feet above sea level, covered by 20-25 feet of horizontally deposited Elk River beds. This level was noted on the south side of Yaquina Head where gravels are plastered against the solid basalt and where slumpage may be ruled out.

There are very few fossils in the Elk River beds to indicate that they are marine; but the truncation of the underlying rock was accomplished by the sea, so the beds immediately overlying the platform were deposited at or very near sea level. There is some peat, which included sticks and stumps, in the Elk River beds just south of the natatorium at Nye Beach. The wood is brown, but does not differ greatly in appearance from the wood in the underlying Coquille formation; although botanical study may reveal significant differences.

A higher terrace is shown just east of Jump-Off Joe and northward along the beach where the Elk River terrace has been removed. Here the higher terrace is capped by horizontal sands also. In the sands is a peat bed about 2 feet in thickness. Whether it was this peat bed or one in the younger Elk River beds that was studied by Hansen and Allison (1942) is not known. They state (p. 86) that the fossil peat bog is located in terrace sands at the north end of Nye Beach. No peat was observed within the Elk River beds at the north end of Nye Beach; so, presumably, the higher bed is the one that was studied. There is also peaty material disseminated in the clay in the Coquille formation north of the natatorium at Nye Beach.

Newport region during the time of Coquille deposition

The Astoria formation near Newport contains basaltic flows and sandstone beds much more resistant than the Nye formation. It is altogether probable that the streams encountered difficulty breaking through this resistant formation except where the major streams had established a valley seaward. Thus Big Creek probably had a southerly course and was a subsequent stream tributary to the Yaquina River. The shore line may have been several miles to the west and a prominent ridge composed of strata similar to those in Yaquina Head may have extended southward. It would not be until the sea had succeeded in eroding through this barrier into the softer Nye sediments that such tributary streams as Big Creek were changed to a westward course. A change in position may have occurred during maximum filling of Coquille sediments when low divides might have been submerged. Later withdrawal of sea level would have caused superposition on the older rock.

Age of Coquille formation and Elk River beds

The age of the downcutting and subsequent alluvial fill of the Coquille formation is believed to be upper Pleistocene. Withdrawal of the water and downcutting is tentatively correlated with glaciation -- alluviation and rise of sea level, with deglaciation. This cycle has occurred once since (our present bays). The earlier is tentatively correlated with early Wisconsin glaciation; the latter, with late Wisconsin glaciation. To date, the age relationships have been determined by position in Pleistocene glacial chronology. The only fossils found in the Coquille formation occur in a cove near the north jetty at Newport. This locality was known to Condon and Diller, but the position of the fauna in the Pleistocene was not as well understood. A study of the fauna is in a preliminary stage; however, the following genera have been recognized:

Mirphae
Macoma
Schizothaerus
Hinnites
Thais

Most of these forms are present along the Oregon coast and are commonly present in estuarine sediments. The rarity of fossils in the Coquille formation is of some interest because present-day fillings would presumably be more fossiliferous. It may be that the remnants of the Coquille formation now preserved are well inland from the old bay mouths, and for that reason in a position where the water was too brackish, or sedimentation was too rapid to allow normal growth of a molluscan fauna.

Kitchen middens are common along the Oregon coast. Shells found in them are predominantly of Mytilus, the common rock mussel. Besides, the middens are located upon the Elk River terrace on points that were convenient camping spots for the Indians and would not be expected to be within the Elk River beds or in muds beneath the wave-cut platform. Thus the fauna at Newport is not a kitchen midden.

Further study of this fauna may yield a basis for closer correlation with other Pleistocene deposits.

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