

AN ABSTRACT OF THE THESIS OF

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Title: Stratigraphy of the Miocene Agate Beach formation
in Lincoln County, Oregon.

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The Miocene stratigraphy of Lincoln County, Oregon, is divided into three formational units. The lowest, the Nye mudstone, which overlies the Yaquina sandstone, has already been formally named and described. This paper describes the upper two units and names them the Agate Beach and Depoe formations. The stratigraphy of the former is treated in detail.

The Agate Beach formation unconformably overlies the Nye mudstone with slight angular discordance. The surface of deposition is highly irregular. The dominant lithology is a greenish gray, silty, fine-grained sandstone, somewhat micaceous, tuffaceous, and carbonaceous. Interbedded in it are layers of greenish gray, tuffaceous, siltstone; silty tuff; coarse sandstone; hard, calcareous sandstone; and concretions. The type section begins at the top of the Nye formation on the cliff 950 feet west of the north abutment of the Yaquina Bay highway bridge, and continues northward along the sea-cliff to the mouth of Johnson Creek. The unconformably overlying basalt on the north side of Yaquina Head is specifically excluded. Other exposures occur at the mouth of Fogarty Creek, Boiler Bay, the inner bay at Depoe Bay, and from Johnson Creek to Otter Rock.

Ten stratigraphic sections were measured in the Agate Beach formation, with a total exposed thickness of 1000 feet. The highest point is at the base of the basalt on the north side of Yaquina Head. The lowest point exposed is at the mouth of Little Creek, where the actual base of the section is concealed by terrace deposits, brush, and soil. Correlation is facilitated by a sequence of tuffaceous layers and by a series of thin, hard, calcareous sandstones rich in large pelecypods.

The more abundant pelecypods found in the Agate Beach formation are Anadara devincta Conrad, A. devincta montereyana Osmont, Marcia angustifrons (Conrad), and Acila conradi (Meek).

NEWPORT BEACH SECTION

The base of the Newport Beach section rests unconformably on the Nye formation in the cliff on the north shore of Yaquina Bay, 950 feet west of the north abutment of the Yaquina Bay bridge on the coast highway. The section continues westward and northward along the sea-cliff to the north boundary of Yaquina Bay State Park, and ends with the highest member exposed in the sea cliff.

Exposures consist of good sea-cliff outcrops, where the Agate Beach formation is exposed between the terrace deposits and the beach sand. Fresh samples were available except in the lowest part of the section, which is badly weathered.

Measurements were made with a ten-foot tape and Brunton compass. Occasional use was also made of a fifty-foot tape and pacing. At the north (upper) end the beds strike $N 10^{\circ}E$ and dip $13^{\circ}NW$. At the south end the strike $N 10^{\circ}W$ and dip $12^{\circ}SW$.

Unconformably overlain by Recent beach sands and terrace deposits.

<u>Unit</u>	<u>Agate Beach formation</u>	<u>Feet</u>
A31.	Siltstone, medium gray N5, fine grained, massive, sandy, slightly indurated with carbonates; Foraminifera rare; some carbonaceous matter. Occasional small pelecypods.	8.4

Newport Beach section, continued

<u>Unit</u>	<u>Agate Beach fm., continued</u>	<u>Feet</u>
A30.	Sandstone, greenish gray 5GY6/1, very fine grained, silty, finely crossbedded, indurated, with interbedded fine layers of medium light gray, tuffaceous siltstone having few Foraminifera.	4.1
A29.	Sandstone, greenish gray 5GY6/1, fine grained, silty, massive. Occasional small pelecypods. Foraminifera rare.	2.5
A28.	Sandstone, light gray N7, coarse grained, in a calcareous matrix. Basal shale 0.1 foot thick.	0.6
A27.	Sandstone, greenish gray 5GY6/1 fresh, weathers to moderate yellowish brown 10YR5/1, coarse grained in a fine-grained silty sandstone matrix, massive, somewhat micaceous, slightly tuffaceous. Casts of pelecypods. Molluscan localities 4026 and 4038.	1.4
A26.	Sandstone, medium light gray N6 fresh, weathers to very light gray N8, fine grained, massive, very tuffaceous, micaceous, some carbon. Molluscan locality 4018*.	15.7
A25.	Sandstone, medium dark gray N4, fine grained, silty, heavy. Occasional small pelecypods.	0.6
A24.	Sandstone, medium gray N5, fine grained, silty, micaceous and carbonaceous. Interbedded with this is a medium dark gray N4, tuffaceous siltstone. Foraminifera rare.	2.6
A23.	Sandstone, greenish gray 5GY5/1, fine grained, silty, micaceous, carbonaceous. Foraminifera rare. Occasional pelecypods. Molluscan locality 4030*.	3.5
A22.	Sandstone, light gray N7.5, medium grained, micaceous. Has middle layer of sandstone, light gray N7.5, composed of mica and quartz, fragments mostly angular and platy. Occasional small pelecypods throughout.	2.4

Newport Beach section, continued

<u>Unit</u>	<u>Agate Beach fm., continued</u>	<u>Feet</u>
A21.	Siltstone, dark greenish gray 5GY5/0.5, sandy, massive, tuffaceous, micaceous. Occasional small pelecypods; abundant Foraminifera. Foraminiferal locality 4133.	5.2
A20.	Siltstone, medium light gray N5.5, sandy, massive, tuffaceous, micaceous.	4.7
A19.	Sandstone, greenish gray 5GY5/0.5, fine grained, massive, micaceous.	16.1
A18.	Sandstone, dark greenish gray 5GY4/1, coarse grained, massive, slightly indurated with carbonates but very poorly consolidated.	1.0
A17.	Tuff, pale greenish yellow 10Y8/2, sandy, massive, very finely crossbedded. Some wood fragments.	5.3
A16.	Concealed by terrace deposits.	13.9
A15.	Sandstone, greenish gray 5GY5/1, very fine grained, silty, very finely laminated, micaceous.	6.0
A14.	Mudstone, medium light gray N6, massive, with leaf impressions. Molluscan locality 4025*.	2.6
A13.	Sandstone, greenish gray 5GY5/0.5, fine grained, silty, massive, somewhat micaceous. Rare Foraminifera and ostracods. Foraminiferal locality 4132.	13.4
A12.	Eroded and concealed by sand.	34.6
A11.	Sandstone, medium light gray, weathers to light olive gray 5Y6/1, medium grained, silty, heavy, well indurated, micaceous. Occasional small pelecypods. Some carbonaceous fragments.	1.5
A10.	Claystone, medium gray N5.5, tuffaceous, massive, slightly micaceous.	1.1

Newport Beach section, continued

<u>Unit</u>	<u>Agate Beach fm., continued</u>	<u>Feet</u>
A9.	Sandstone, medium gray N5, fine grained, silty, massive, somewhat micaceous. Common small pelecypods and carbon fragments. Molluscan localities 4017, 4020, 4021, 4024, 4029, 4037.	6.7
A8.	Siltstone, dark greenish gray 5GY4/1, sandy, massive, tuffaceous.	2.9
A7.	Sandstone, medium light gray N5.5, fine grained, silty, massive, somewhat micaceous.	1.3
A6.	Siltstone, greenish gray, massive, tuffaceous.	0.9
A5.	Sandstone, greenish gray 5GY5/1, fine grained, silty, massive, micaceous.	18.5
A4.	Siltstone, medium light gray, weathers to greenish gray 5GY6/1 and to moderate yellowish brown 10YR5/4, sandy, massive, tuffaceous. Rare small gastropods.	2.7
A3.	Sandstone, light olive gray 5Y6/1, fine grained, silty, massive, with large calcareous concretions.	10.8
A2.	Siltstone, medium light gray N6, sandy, massive, tuffaceous, with carbon particles.	2.4
A1.	Sandstone, light olive gray, fine grained, silty, massive.	3.6

Total exposed thickness of Agate Beach fm. -- 197 feet.

Unconformably overlies the Nye mudstone.

NYE BEACH SECTION

The base of this section is in the sea cliff at the point at the south end of Nye Beach where the lowest cliff outcrop of the Agate Beach section disappears under the terrace deposits. The section continues N 82°W across the beach and includes a series of outcrops exposed on the beach at very low tides. This section is accessible only at negative tides and most of it is normally covered by beach sand except after a storm. The exposures are very poor and fragmentary. The details are therefore incomplete.

The section was measured by pacing and with the use of a Brunton compass. The bedding strikes N6°E and dips 25°W.

This section can be correlated with the Newport Beach section by lateral tracing of beds. A tuffaceous bed, unit B4, can be seen to be continuous with unit A26 of the Newport Beach section. Also, another tuffaceous bed, unit B12, can be traced laterally to a point above the top of the Newport Beach section.

NYE BEACH SECTION

Unconformably overlain by the Pacific Ocean.

<u>Unit</u>	<u>Agate Beach formation</u>	<u>Feet</u>
B16.	Siltstone, greenish gray, very tuffaceous.	10.6
B15.	Mostly sandstone, greenish gray, fine grained, silty, massive, interbedded with siltstone, greenish gray, somewhat tuffaceous. Details not clear.	33.0
B14.	Sandstone, greenish gray, coarse grained.	0.8
B13.	Sandstone, greenish gray, fine grained, silty, massive.	1.2
B12.	Siltstone, greenish gray, weathering to light gray, very tuffaceous.	16.9
B11.	Sandstone, gray, very well indurated, hard.	0.4
B10.	Sandstone, like unit 13.	1.3
B9.	Siltstone, greenish gray, sandy, somewhat tuffaceous.	4.6
B8.	Sandstone, like unit B13.	7.2
B7.	Siltstone, like unit B9.	0.2
B6.	Sandstone, like unit B13.	7.2
B5.	Completely concealed by beach sand.	50.7
B4.	Tuff, greenish gray weathering almost to white, sandy, silty. (Also exposed in cliff).	21.1
B3.	Sandstone, greenish gray 5GY5/1, fine grained, silty, tuffaceous, somewhat carbonaceous. Occasional small pelecypods. Good exposure on sea cliff.	18.9
B2.	Siltstone, greenish gray, sandy, tuffaceous.	1.5
B1.	Sandstone, like unit B13.	7.0
Total exposed thickness of Agate Beach fm. -- 183 feet.		
Base concealed by terrace deposits.		