

## FAUNA FROM THE EOCENE OF WASHINGTON

by

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### INTRODUCTION

The purpose of this paper is to place on record the description and illustration of new fossil molluscan species from the Eocene formations of western Washington. For several years the writers have been engaged in an investigation of the Washington Eocene, the results of which are to be published in a stratigraphical and faunal history of the Eocene of the Northwest. Extensive collections were made from the Eocene formations of Washington as well as those of Oregon. These were in every case, where possible, tied into stratigraphic sections. A preliminary study of the faunas was made in the paleontological laboratory of the University of California. Later the material was divided into duplicate collections, one of which was retained by the senior writer for study in the paleontological laboratory of the University of Washington and the other by the junior author at Cornell University. Accordingly there has been opportunity for study and comparison with the marine Eocene of California as well as with that of the Atlantic and Gulf. Of the new species recognized as a result of these investigations, sixty-four are described in this report. A list of faunal localities in western Washington has been included. This list is a continuation of the series as published in volume 1, number 1, of the University of Washington Publications in Geology.

**FAUNAL LOCALITIES IN WESTERN WASHINGTON**

315

At dam just below the railroad bridge on the west bank of Olequah Creek about one-third of a mile below the junction with Stillwater Creek, near Vader, Lewis County. Opposite 316. Section 32, Township 11 North, Range 2 West. Eocene.

316

At dam just below the railroad bridge on east bank of Olequah Creek about one-third of a mile below the junction with Stillwater Creek near Vader, Lewis County, Section 32, Township 11 North, Range 2 West. Eocene. Old locality 240.

317

On the south bank of Stillwater Creek at its junction with Olequah Creek, near Vader, Lewis County, Section 32, Township 11 North, Range 2 West. Eocene. Old locality 5.

318

On the north bank of Stillwater Creek at its junction with Olequah Creek, opposite 317, near Vader, Lewis County, Section 32, Township 11 North, Range 2 West. Eocene.

319

At McClarety ranch on the south bank of Stillwater Creek one mile west of Vader, Lewis County, Section 30, Township 11 North, Range 2 West. Eocene. Old locality 294.

320

On the south bank of Stillwater Creek below the graveyard about one and one-fourth miles from Vader, Lewis County, Section 30, Township 11 North, Range 2 West. Eocene.

321

On Booth ranch two and one-fourth miles up Stillwater Creek from its junction with Olequah Creek, near Vader, Lewis County, Section 25, Township 11 North, Range 3 West. Eocene. Old Locality 296.

322

On small creek about one-third of a mile from its junction with Brinn Creek, under an old bridge, Lewis County, Section 24, Township 11 North, Range 2 West. Eocene. Old locality 3.

323

In bed of small creek entering Olequah Creek on the east, opposite locality 324. Section 29, Township 11 North, Range 2 West. Eocene. Old locality 297.

324

In west bank of Olequah Creek about one-eighth of a mile north of Vader station, Lewis County, Section 29, Township 11 North, Range 2 West. Eocene. Old locality 297.

325

On Olequah Creek one-fourth of a mile above Vader station in the east bank of creek, just north of point where the small creek enters Olequah Creek on the east, Section 29, Township 11 North, Range 2 West. Eocene. Old locality 237.

326

Bluff on west bank of Olequah Creek about 500 feet below the little falls, back of Armstrong place about one-half mile north of Vader, Lewis County, Section 29, Township 11 North, Range 2 West. Eocene. Old locality 231.

327

East bank of Olequah Creek back of Cantwell place about one mile north of Vader, Lewis County, Section 20, Township 11 North, Range 2 West. Eocene. Old locality 300.

328

East bank of Olequah Creek about one and one-half miles north of Vader where creek runs near railroad track. Seam of brackish water fossils. Section 20, Township 11 North, Range 2 West. Eocene. Old locality 295.

329

West bank of Cowlitz River at bend and extending several hundred feet below near Vader, Lewis County, Section 28, Township 11 North, Range 2 West. Eocene. Old locality 233.

330

On east bank of Cowlitz River, about one mile above the ferry on Greece's ranch, four miles east of Vader, Lewis County, Section 25, Township 11 North, Range 2 West. Eocene or Oligocene. Old locality 239.

331

In railroad bluff about one and one-half miles south of Vader, Lewis County, about 700 feet below railroad post No. 79, Section 4, Township 11 North, Range 2 West. Eocene. Old locality 299.

332

Bluffs along Stillwater Creek about one-half mile above the junction of Olequah and Stillwater creeks, near Vader, Lewis County, Section 30, Township 11 North, Range 2 West. Eocene.

333

On Stillwater Creek about three-fourths of a mile above its junction with Olequah Creek. A narrow seam. Section 30, Township 11 North, Range 2 West. Eocene.

334

On Cowlitz River about three-fourths of a mile below Olequah station, about 800 feet below post No. 81, where path leads down the bank to the river. Section 4, Township 10 North, Range 2 West. Eocene.

335

At old dam about three-fourths of a mile above the junction of Mosquito and Coal Creeks, Cowlitz County, Section 10, Township 8 North, Range 3 West. Eocene.

336

About one-fourth of a mile above the old dam on Coal Creek, Cowlitz County. Brackish water shells and fossil leaves found in high water bed across from high bluffs. Section 11, Township 8 North, Range 3 West. Eocene.

337

About one-half mile above old dam, on west bank of Coal Creek, Cowlitz County. Fossil seam in high bank. Section 11, Township 8 North, Range 3 West. Eocene.

338

About 400 feet below locality 339, on Coal Creek, Cowlitz County, Section 11, Township 8 North, Range 3 West. Eocene.

339

About one-fourth of a mile below Inman-Polson shops at bend in creek about 200 feet below high bluff where railroad is visible on Coal Creek, Cowlitz County. Large oyster bed. Section 11, Township 8 North, Range 3 West. Eocene.

340

About 200 feet below railroad trestle on east bank of Coal Creek, Cowlitz County. Oyster beds. Section 11, Township 8 North, Range 3 West. Eocene.

341

At Inman-Polson shops (old Inman-Polson store) about two and one-half miles up Coal Creek from Mount Solo, Cowlitz County, Section 2, Township 8 North, Range 3 West. Eocene.

342

About one-fourth of a mile above Inman-Polson shops on Coal Creek, Cowlitz County, Section 2, Township 8 North, Range 3 West. Eocene.

343

On west bank of Coal Creek, Cowlitz County, about one-half mile above where small creek enters on the east, at Inman-Polson shops, Section 2, Township 8 North, Range 3 West. Eocene.

344

On Coal Creek, Cowlitz County at falls about one-fourth of a mile above wagon road bridge, Section 35, Township 9 North, Range 3 West. Eocene.

345

On Coal Creek at large falls about one-half mile below the schoolhouse, Cowlitz County, Section 35, Township 9 North, Range 3 West. Eocene.

346

At small falls just below bridge at schoolhouse settlement on Coal Creek, Cowlitz County, Section 35, Township 9 North, Range 3 West. Eocene.

347

Back of old Leybo place about one-half mile below old Inman-Polson camp, on Coal Creek, Cowlitz County, Section 27, Township 9 North, Range 3 West. Eocene.

348

On Coal Creek just above old Leybo place about one-half mile above the footbridge, Cowlitz County, Section 27, Township 9 North, Range 3 West. Eocene.

349

On Coal Creek at old Inman-Polson camp about six or six and one-half miles up Coal Creek, just above where small creek enters on the east side. Section 27, Township 9 North, Range 3 West. Eocene. Old locality 243.

350

On Coal Creek about one-fourth of a mile below the old Inman-Polson camp, Cowlitz County, Section 27, Township 9 North, Range 3 West. Eocene.

351

On the east bank of Cowlitz River about one-fourth of a mile below Greece's ranch, small seam in the river bed, Section 26, Township 11 North, Range 2 West. Oligocene or Eocene.

352

In railroad cut on Oregon-Washington R. R. & Navigation Co. line, one mile north of Lincoln Creek station in Section 27, Township 15 North, Range 3 West. Oligocene. Old locality 256.

353

One mile south on west shore of bay, from boulders not in place, near Quilcene, Jefferson County, Section 24, Township 27 North, Range 2 West. Oligocene.

354

About one-half mile north of Centralia, on the Northern Pacific Railway, Lewis County, Section 4 North, Township 14, Range 2 West. Eocene.

355

From cliffs about one mile north of Point Grenville, north of Moclips, Grays Harbor County, Section 13, Township 21 North, Range 13 West. Pliocene.

356

From cuts on grade of Willapa Harbor branch of Milwaukee R.R. at Sudbury, 15 miles east of Raymond at summit, four miles east of P. and E. junction, Pacific County. Miocene.

357

From cuts in grade of Willapa branch of Milwaukee R.R., in cuts about two miles east of P. and E. junction, 13 miles east of Raymond, Pacific County. Miocene.

358

At Joyce Station, one-fourth mile east of Tongue Point R. R. at Port Crescent, Clallam County, Section 22, Township 31 North, Range 8 West. Eocene.

359

In wagon road cut just east of Porter, Grays Harbor County, Section 27, Township 17 North, Range 4 West. Oligocene.

360

From bluffs at Porter station in Northern Pacific R.R. cut, Grays Harbor County, Section 22, Township 17 North, Range 4 West. Oligocene. Old locality 160 .

361

Exposure on east bank of Porter Creek just above where wagon road crosses creek at the town of Porter, Grays Harbor County, Section 27, Township 17 North, Range 5 West. Oligocene.

362

Exposure about one mile up Porter Creek from station on east bank just above the wagon bridge, Grays Harbor County, Section 22, Township 17 North, Range 5 West. Oligocene.

363

Exposure on Porter Creek, one and one-half miles from Porter station, Grays Harbor County, Section 22, Township 17 North, Range 5 West. Oligocene.

364

Exposure at old dam about three miles up Porter Creek from station, Grays Harbor County, Section 14, Township 17 North, Range 5 West. Oligocene.

365

Bluff on west bank of Porter Creek about three and one-half miles up Porter Creek from station, Grays Harbor County, Section 22, Township 17 North, Range 5 West. Oligocene.

366

At contact between the Oligocene sediments and Eocene basalt four and one-half miles up Porter Creek, Grays Harbor County, Section 14, Township 17 North, Range 5 West. Oligocene.

367

On Gibson Creek, a few hundred feet above where the creek crosses the Northern Pacific R.R., about three miles southeast of Porter, Grays Harbor County, Section 2, Township 16 North, Range 5 West. Oligocene.

368

At German's place, Castle Rock, Cowlitz County, Section 24, Township 9 North, Range 2 West.

369

Head of Arkansas creek, Cowlitz County, Section 24, Township 10 North, Range 3 West.

370

At Scattagrege Falls, Cowlitz County, Section 18, Township 9 North, Range 2 West. Eocene.

suture; canal short, wide; aperture subovate; suture appressed; sutural band on the upper portion of whorl bounded below by a depression; the sutural sinus, formed by the lines of growth, makes at the lower margin of the sutural band a reentrant curve at an angle of approximately  $50^\circ$ ; whorls decorated by seven revolving lines, with 19 on the body whorl; the spiral lines are crossed by 12 or 13 longitudinal ribs which follow the curves of the growth lines, these ribs continue over the length of the whorls of the spire but are only slightly developed on the body whorl, becoming obsolete on the lower region of that whorl.

The sculpture of this shell is more like that of some of the recent West Coast species which Dr. Dall calls *Moniliopsis* than like that of the Eocene type *Pleurotoma elaborate* Conrad which is beautifully and profoundly cancellated. In shape, position of the sinus of the longitudinal striae, and the character of the aperture and canal, *fryei* has the characteristics of typical *Moniliopsis*.

Named in honor of Dr. T. C. Frye of the Botanical Department of the University of Washington.

*Dimensions*.—Altitude 7.5 mm.; width of body whorl 2 mm.

*Occurrence*.—At locality 329 (University of Washington Palaeontological Collection) at bend in the Cowlitz River, near Vader, Lewis County, Section 28, Township 11 North, Range 2 West.

#### GENUS CONUS LINNEAUS

#### CONUS VADERENSIS n. sp.

Plate XII, Figures 7, 8

*Conus hornii* Weaver, 1912, Wash. Geol. Sur., Bull. 15, pl. 11, fig. 17; not *Conus hornii* Gabb, 1864.

*Conus remondii* Dickerson, 1915, Proc. Cal. Acad. Sci., vol. V, No. 3, pl. 11, fig. 7; not *C. remondii* Gabb, 1864.

*Description*.—Shell of medium size, biconical; whorls four to five with three to four smooth, apical whorls which are very pointed; suture appressed; area between the suture and the shoulder of the whorls concave and sculptured with fine, curved striae; shoulder decorated with 16 or 18 nodes; body whorl covered with revolving, microscopically, raised ribs crossed by longitudinal lines. The spiral ribs or lines are better developed on the posterior region of the whorl; aperture long and narrow with parallel sides.

This shell is close to *C. remondii* Gabb. Gabb states that the sides of the whorls are straight and regularly conical. His illustration bears out this characteristic. The sides of the whorls of *C. vaderensis* are concave. The general

appearance of this species is somewhat similar to *C. cowlitzensis* Weaver, but the spire of both young and mature individuals of *C. vaderensis* is only about one-half that of *C. cowlitzensis*. The former possesses also a characteristically greater diameter.

*Dimensions*.—Altitude of shell 29 mm.; width of body whorl 12 mm.; apical angle 60°.

*Occurrence*.—At locality 329 (University of Washington Palaeontological Collection) at bend of Cowlitz River, near Vader, Lewis County, Section 28, Township 11 North, Range 2 West.

GENUS GONIOBASIS LEA

GONIOBASIS HANNIBALI n. sp.

Plate XII, Figures 2, 3

*Description*.—Shell medium, thin and polished; elongate-conic in shape; whorls probably eight, specimens usually broken at fourth or fifth whorl; sides of the whorls very slightly convex; suture linear; aperture subovate, produced below, not sinuated but widely united at the anterior end. Surface ornamented with from sixteen to twenty vertical ridges or plications which are developed in parallel waves over all the whorls; crossing the longitudinal ribs there are usually six spiral lines or ribs with interspaces half their width; at the intersection of the vertical and spiral ribs fine nodes are produced which give the longitudinal ridges a beaded appearance; the vertical riblets do not continue over the basal portion of the body whorl, that region ornamented by spiral lines only.

The decoration of this shell is extremely variable. The extreme form in sculpture has been taken for the type of the species. *Goniobasis olequahensis* (Arnold and Hannibal) represents the smooth type of shell. A large amount of material collected of this species contains specimens of all stages of sculptural development. The smooth shells reveal on the lower whorls only fine wavy, oblique lines; many shells have oblique, longitudinal, plications on the nuclear whorls which may be absent on the lower whorls. The occurrence of the spiral ribs is not definite, they may occur on one whorl and not on the others; they may be present on the upper portion of a whorl or whorls, or they may occur only on a portion of one or several whorls. The occurrence of the spiral band or line just below the suture is not a constant character, and on the lower portion of the body whorl there may or may not be a set of spiral lines. The figured specimens of this species (Pl. XII Figs. 2, 3) illustrate a difference in sculpture. The collection contains specimens which show transition stages between the two types of shell as illustrated.

## EXPLANATION OF PLATE XII

All figures approximately natural size unless otherwise stated

Fig. 1.	<i>Gemmula fasteni</i> n. sp. x 2 -----	p. 42
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