Upper Jurassic Mudstone Unit Named in Snake River Canyon, Oregon-Idaho Boundary

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WITHIN THE narrow belt of pre-Tertiary rocks exposed along the canyon of the Snake River in extreme northeastern Oregon and adjacent parts of Idaho and Washington is a well-defined angular unconformity between Triassic and Jurassic strata (see Figure 1). The Triassic rocks constitute a thick unit of predominantly volcanic origin. Included in this unit are lava, minor amounts of pillow lava, and abundant rugose beds of fragmental material derived from submarine volcanic eruptions. Subordinate beds of limestone containing fossils of probable Upper Triassic age (written communication, N. J. Silberling, 1962) are interlayered with the fragmental material. (See also, for example, Mills, 1962: 238.)

Figure 1. Jurassic shale and interlayered diorite sills overlie with angular unconformity Triassic limestone and associated fragmental rocks. See Figure 2 for location of photograph.

Unconformably overlying this thick sequence of volcanic and sedimentary material is a thinly bedded Jurassic mudstone. This unit is herein named the Coon Hollow Formation because of its typical exposures in Coon Hollow (45°57′25″ N-116°53′18″ W), a small canyon cut by a creek flowing from Oregon into the Snake River (see U.S. Forest Service planimetric quadrangle "Dead Horse Butte," scale: 1:31, 680). In addition to mudstone, the sedimentary rock of the Coon Hollow Formation includes subordinate amounts of pebble conglomerate and minor amounts of lithic graywacke. Diorite and quartz diorite, occurring predominantly as sills, have been injected into the Coon Hollow Formation at many localities.

Extent and Thickness

Figure 2 indicates the location and the approximate extent of the known exposures of the Coon Hollow Formation. The unit crops out along the canyon of the Snake River over an area about five miles in length and three miles in width. Its southern limit is marked by an angular unconformity

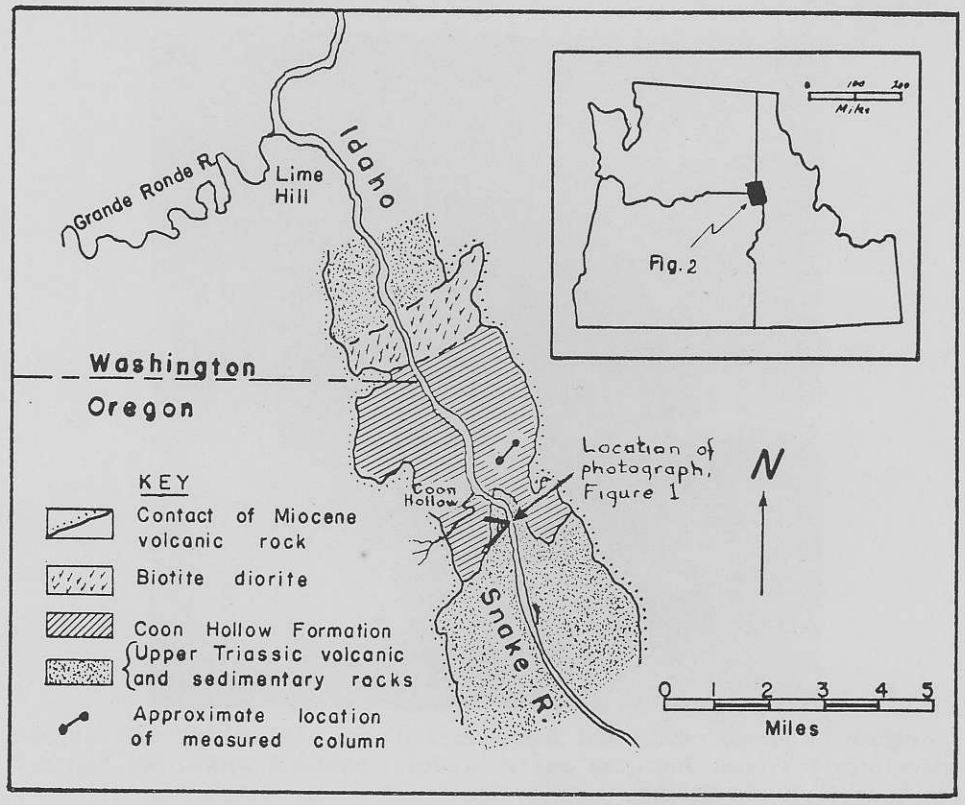

Figure 2. Sketch map showing location and approximate extent of the Coon Hollow Formation in the vicinity of the type locality.

where the base of the Coon Hollow Formation overlies the eroded surface of Upper Triassic limestone and associated fragmental rocks. Along this contact the lowest unit in the Coon Hollow Formation is a basal conglomerate containing boulders derived from the underlying limestone and volcanic rocks. Toward the east and the west, the Jurassic sedimentary rocks of the Coon Hollow Formation disappear beneath the Miocene lavas of the Columbia River Plateau. Toward the north, the unit is terminated by a small intrusion of biotite diorite.

Because of structural complications, the total thickness of the Coon Hollow Formation cannot be measured through a single, continuous section. A measured section, representing the major part of the total stratigraphic thickness, however, is illustrated in Figure 3. This section, measured from approximately the center to the northeast corner of section 6, T. 30N., R. 4W., Nez Perce County, Idaho, is proposed as the type locality of the Coon Hollow Formation. It includes rock exposed in the northern wall of the valley cut by the unnamed creek which empties from the Idaho side into the Snake River, opposite the northern of the two small islands in the bend of the river.

The stratigraphic column represents a thickness of approximately 1250 feet of sedimentary rock as well as approximately 550 feet of quartz diorite sills. The sills are not formally part of the Coon Hollow Formation. In addition to the stratigraphic thickness shown in Figure 3, there is an estimated 275 feet of sedimentary rock below the base of the measured column and another 400 feet stratigraphically higher than the top of the column. The minimum stratigraphic thickness of the Coon Hollow Formation is therefore estimated to be nearly 2000 feet.

Lithology

Black mudstone is the most abundant and characteristic rock of the Coon Hollow Formation. It is noncalcareous, hard, and well indurated. Splintery fragments, abundant on most weathered outcrops of the mudstone, have resulted from a well-developed pencil structure which is controlled by intersecting planes of incipient cleavage.

Bedding is defined by light-colored lenses less than one inch thick, interlayered every few inches throughout the black mudstone. The lighter-colored lenses are coarse silt and very fine sand. In thin section individual angular grains of quartz and chloritized plagioclase may be distinguished in these coarser lenses, whereas even under high power, the black mudstone matrix is an irresolvable turbid chlorite-magnetite-quartz mixutre. The light-colored, coarse silt lenses characteristically display small-scale graded bedding.

The conglomerate of the Coon Hollow Formation is composed of well-

sorted, rounded pebbles, occasionally as large as five inches in diameter, which are densely packed to form a hard, resistant rock. The epiclastic pebbles are so tightly compressed, in part as the result of mutual solution along grain boundaries, that the amount of intergranular void space and fine-grained interstitial matrix material is negligible.

Most of the fragments are clasts of sedimentary rock. Chert pebbles and rounded fragments of silicified siltstone are most common. Less abundant are

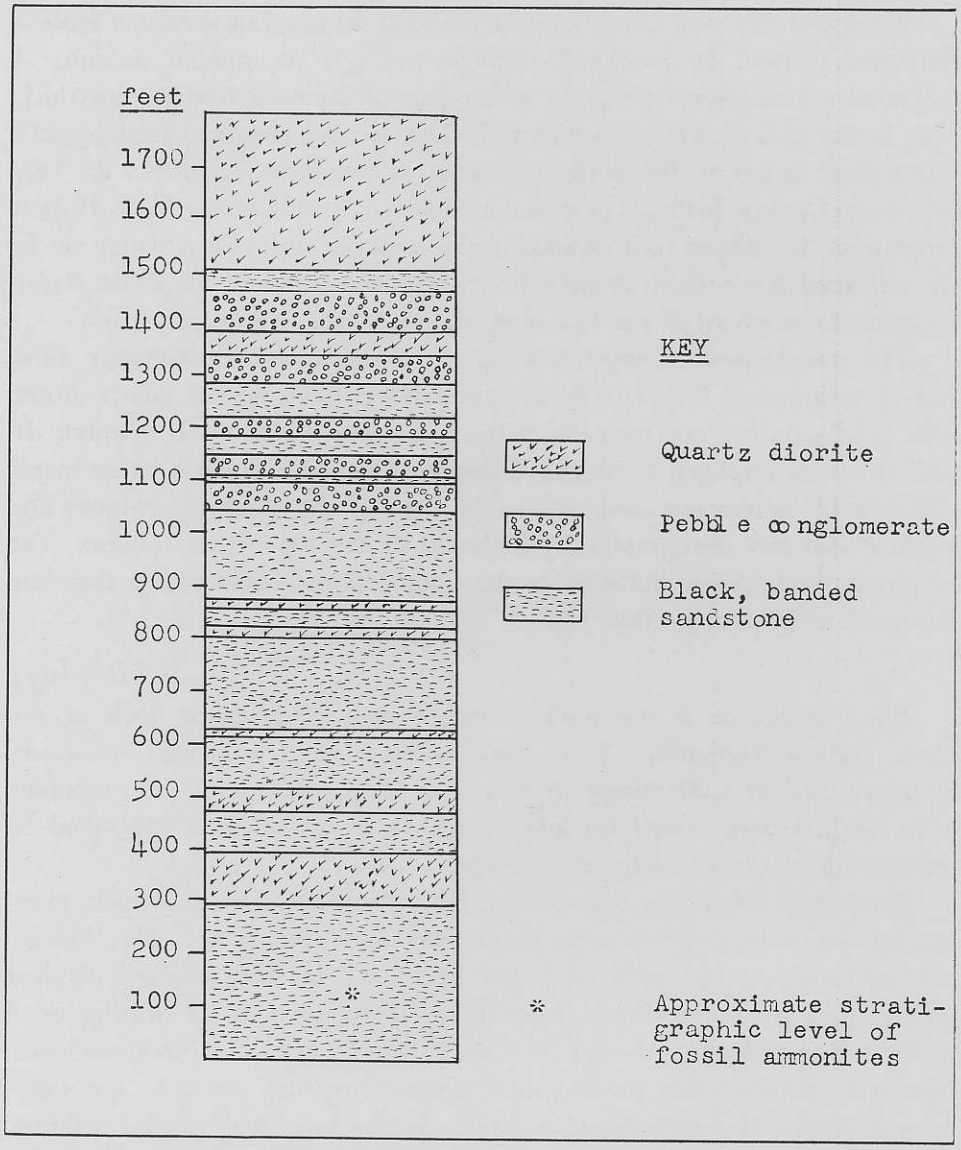

Figure 3. Stratigraphic column.

clasts derived from rocks of volcanic origin that are dominantly slightly altered aphanitic andesite. No fragments of coarse-grained plutonic rocks or of limestone have been found above the basal conglomerate in the body of the Coon Hollow Formation.

Age

Fossils are sparse in the Coon Hollow Formation. The fine pencil structure which characterizes the black mudstone makes preservation of megafossils on weathered surfaces unlikely. Five ammonite specimens have been obtained, however, by quarrying to a depth of several feet in order to expose more massive mudstone. These were identified by R. W. Imlay, who reports that they are identical with the inner whorls of *Cardioceras* (*Scarburgiceras*) *martini* Reeside from the basal part of the Naknek Formation, Alaska. He states (written communication, 1962) that the genus *Cardioceras* in Northwest Europe occurs only in the lower part of the Oxfordian stage.

As indicated in Figure 3, the dated fossils occur stratigraphically low in the Coon Hollow Formation. No fossils have yet been found in the upper part of the formation.

Acknowledgments

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Literature Cited

Mills, J. W. 1962. High-calcium limestones of eastern Washington. State of Washington Div. of Mines and Geology Bull., 48. 268 p.

Morrison, R. F. 1961. Angular unconformity marks Triassic-Jurassic boundary in Snake River area of northeastern Oregon. State of Oregon Dept. of Geology and Mineral Ind., The Ore-Bin, 23: 105-111.