

so that the presence of Corniferous rocks is doubtful. The recent map of the Canadian survey makes a Devonian belt (with Carboniferous beds) to come down from the far north, along by the summit of the Rocky Mountains, into the United States.

The Corniferous limestone in some places abounds in mineral oil. The oil wells of Enniskillen, western Canada, are from this rock, according to T. S. Hunt (1863); large areas are covered with the inspissated bitumen. At Rainham, Canada, on Lake Erie, shells of *Pentamerella arata* are sometimes filled with the oil; and in other localities Corals of the genera *Heliophyllum* and *Favosites* have their cells full, in some layers of the limestone, while empty in other layers.

The facts, with regard to the distribution of the Devonian formations in North America, the history of geological discovery in connection with them, their geological relations and distinctive features, are clearly and fully presented by H. S. Williams, in Bulletin No. 80 of the *U. S. Geol. Survey*, and partly from personal observation.

*Interior Continental and Appalachian region.* — The *Canda-galli grit* in New York is a drab or brownish argillaceous sandstone, often shaly and crumbling. From eastern New York it continues along the northwestern boundary of New Jersey, and the eastern of Pennsylvania, where it is a gritty slate, and is in some places 400' to 500' thick.

The Corniferous limestone in New York consists of two members, — the gray *Onondaga* limestone, or *lower* part, and the darker *Corniferous*, or *upper*. But the two alternate with one another, and no distinction is now recognized. The limestone is sometimes oölytic. Its thickness, as found where boring for oil and salt, is commonly 100' to 160'; at Ithaca only 78'. Along the Delaware, south of Port Jervis, N.Y., to the New Jersey boundary, the thickness is about 250'; the flint nodules are from an inch to a foot in diameter, and often contain shells and remains of Crinoids.

In Ohio it occurs on both sides of the Cincinnati geanticline, and also along the shores of Lake Erie. On Kelleys and Middle islands, in this lake, the beds have the characters of old coral reefs, like those at the Falls of the Ohio. It corresponds, it is supposed, to the whole Upper Helderberg period; two divisions are made out, — the *lower*, named the *Columbus*, or *Sandusky*, and the *upper*, the *Delaware* limestone.

In Missouri, siliceous and sandstone layers alternate with the limestone.

*Rocky Mountain and Pacific border regions.* — In the Eureka district, the thickness, according to A. Hague, is 8000'; the lower, 6000', limestone (see page 592); and the rest, shales. Lower Devonian fossils exist in the lower part for at least 500', and Upper, in the upper portion; but no subdivisions could be marked off. The Eureka district appears, therefore, to be the center of one of the extra thick Devonian basins, like those of the Appalachian region, and Gaspé of eastern Canada, on the St. Lawrence Gulf. How far south or north the thick beds continue is not known. To the north, in the Tucubit Mountains, Devonian occurs.

In Arizona, in the Kanab Cañon (112½° W.), the whole Devonian is only 100' thick (Walcott).

In the Wasatch region, the "Ogden quartzite" is referred to the Devonian, by King, who found it at Ogden Cañon 1200' to 1400' thick, at Cottonwood Cañon 1000', and at some points in Middle Nevada 800' to 900'. In the Wasatch Mountains, the lower 1400' or more of the overlying Wasatch limestone (7000' thick) is Devonian, it affording fossils of the Upper Helderberg, Genesee, and Chemung. See King, *Geol. 40th Par.*, page 236.

In the Laramide range of the southern part of British America occur 1500' of Devonian limestone (McConnell).