

County, where the Catskill is made 4500' thick, 2300' to 2443' are referred to the Chemung and Portage (I. C. White). Above lies a transition Catskill-Chemung group of 1000', regarded as transitional because they are so in color, and contain some Chemung fossils; and to the west, the true Catskill group wholly disappears; that is, the rocks have nothing of the Catskill characteristics.

In Prosser's section in Monroe County, Pa., referred to on page 594, he found the beds to correspond to the Portage, Oneonta, and Chemung, through a thickness of 3050', and to include the Chemung beds of White, and the overlying Starucca sandstone, 600', New Milford shales, 100', and the Delaware flags, 1200'. Above come the Montrose shales and the so-called Catskill beds, the last consisting of the Honesdale sandstone, the Cherry Ridge group, 325', the Elk Mountain sandstone and shale, 200', and the Mount Pleasant, 1150', Red shale, 300'; about 2000' in all.

The "Black shale" of the Central Interior occurs in Indiana, at the Falls of the Ohio, with Genesee shale fossils at its base; in Kentucky, 200' thick in the northeast part, and diminishing southwestward. In Illinois it is 40' to 60' thick, the thickest along the Ohio; it contains a Genesee *Lingula*. In Tennessee, through much of the state, it is 100' thick and less. Owing to denudation, it is not found in central Tennessee. In Arkansas and Missouri, its equivalent, the Eureka shale, is 0' to 50' thick.

In Ohio, the *Ohio shales* include the Cleveland shale, Erie shale, and Huron shale of Newberry; a belt of it, 10 to 20 miles wide, and several hundred feet thick, stretches across Ohio from Lake Erie to the Ohio Valley, and is noted for its calcareous and ferruginous concretions; the lower part corresponds to the Huron shale, and the upper beds to the Cleveland shale. At its base, or directly below it, Hamilton fossils have been found; but above, a few Portage and Chemung species. The Cleveland shale has afforded many remains of Fishes. The Perry sandstones of southern New Brunswick are mentioned on page 594.

The yellow sandstone at Pine Cove, Muscatine County, Iowa, and the Rockford shale belong near the base of the Chemung.

In a paper by Darton (1893) it is proposed to adopt the name Catskill for the period including the Chemung and Portage. But, as has been shown, it has not the fossils that would entitle it to such a position. In fact, the name Catskill has no right to a place in the time series. Its introduction was from the first an error.

In the Arctic regions, on the eastern part of the north coast of Grinnell Land, at Dana Bay, occurs an area of rocks containing *Productus mesolobus* or *costatus*, a *Spirifer*, etc., which are referred by the authors to Devonian (Feilden & De Rance, *Q. J. G. S.*, xxxiv., 1878); but these fossils are Carboniferous.

An interesting excursion in eastern New York, for the study of the Devonian series, may be had by going to Catskill Village, and passing westward over the hills at the base of the Catskill Mountains. Over the Hudson River slates lies the water-lime of the Middle Upper Silurian; then the successive subdivisions of the Lower Helderberg. Beyond lies the Corniferous limestone of the Lower Devonian; then the Marcellus shale and Hamilton sandstones. Moreover, the flexures of the rocks are instructive. See W. M. Davis on the Little Mountains, *Appalachia*, 1882, page 20.

Rondout, N.Y., on the Hudson River, affords a section from the Hudson beds to the Corniferous inclusive, part quite fossiliferous, and the line of a great fault above the Hudson beds, and is another good place for the geological student. See W. M. Davis, *Am. Jour. Sc.*, 1883, vol. xxvi.

The Devonian series of the Pahrangat Range, central Nevada, is 3000' thick, and is fossiliferous. It rests on the Silurian. For notes on the Upper Devonian of the Eureka district, see pages 589, 592.

*Mineral oil and gas.*—The upper part of the Upper Devonian is the chief source of the mineral oil and gas of Pennsylvania. The drillings