

in the nearer mountains to the north, west, and south. These sources were probably in the Highlands and other ridges of crystalline rocks; the waters and sediment certainly did not come from the Catskill Mountains to the north, nor from the Alleghanies to the west. The outlet of the Hudson River of the period to the Atlantic is indicated, apparently, by the submerged Hudson River channel on the map on page 18.

The barrier along the sea margin that kept out salt water and its living species was evidently the remains of the old geanticline referred to on page 387.

The coarse conglomerate at or near the top of the sandstone series, observed at many points on the east margin of the Connecticut valley area, and on the west or inner margin of that of Maryland, Virginia, and North Carolina, in which many of the rounded stones are one to three feet in diameter, and also the similar large stones, or groups of stones, occurring isolated in some of the finer sandstones, are remarkable features of the formation. Rivers cannot transport so large boulders, unless down rapid slopes. The tide in an estuary opening seaward only moves quietly, and usually makes muddy or sandy shores. Igneous eruptions are never attended by ejections of *rounded* stones or boulders. The stones, excepting those of Triassic sandstone and trap, show by their kinds that they were from the adjoining ridges or hills. Moving ice would carry them; but the Blue Ridge and other adjoining ridges at the present time are far from high enough to have glaciers about their summits. The question arises: Were they high enough then? Was there, at or near the close of the period, an epoch of unusual cold having icy winters and covering the adjoining ridges with glaciers that carried boulders, and made streams that bore floating ice laden with stones out over the river or estuary waters?

5. *Subsidence in progress during the deposition.*—Since a thickness of some thousands of feet was acquired in the several areas by the strata, and the beds often bear evidence in their ripple-marks, mud-cracks, and foot-prints of shallow-water origin, each of the troughs of valleys must have been undergoing, during the slow accumulation, a concurrent subsidence of as many thousands of feet. On the upturning of the beds and other orographic phenomena see page 798.

*Economical products.*—The coal-beds, already described, are a prominent part of these products. Veins containing copper ores occur in Connecticut, New Jersey, Pennsylvania, which have been worked; but none are now producing ore. The copper ores are chiefly chalcocite and bornite, with occasionally native copper. One mass of native copper found in the drift north of New Haven, Conn., weighs nearly 200 pounds. A copper mine at Bristol, Conn., which was for a while productive, is situated on the western border of the Triassic, in the crystalline rocks outside of the sandstone area, but belongs to a fissure of the Triassic series. Barite often accompanies the ore, and sometimes is the chief mineral of the vein, and occasionally occurs in crystals weighing over 100 pounds. A vein in Cheshire, Conn., now exhausted, yielded a large amount of the mineral for the adulteration of white lead, and for calsomining and other purposes.

The beds of sandstone afford much rock for building purposes. The rock so used is