

Coal D, Carbon Hill, Pittston, Pa. ; Vermilion County, Ind. ; Duquoin and St. John, Ill.

Coal D or E, Sullivan County, Ind. ; Hopkins and Christian counties, Ky.

Coal E, Mammoth bed at Pottsville, Pittston, Yatesville, Pa. ; Nelsonville and Coshocton, Ohio ; Stark and Peoria counties, Ill.

Coal E and F, Wilkesbarre, Pa. ; Nelsonville and Coshocton, Ohio.

Coal F, Plymouth, Pittston, and Maltby, Pa.

Coal G, Olyphant, Plainsville, Gate and Salem veins, Pottsville, Pa. ; Pomeroy, Ohio.

At Cannelton, Pa., the number of species of plants obtained from the coal-bed of the B or C horizon, according to Lesquereux, is 140 ; at Mazon Creek, Ill., from the bottom of the coal-bed B, 150 species, and adding those from the overlying clay-bed, 200 species ; and if the species from the same bed at Murphysboro be added, with others the bed affords in Missouri, the number mounts up to 250 species, which is a very large flora for one coal-bed level. The whole number of plants thus far described from the American Coal-measures, the Permian portion included, is 900.

3. PERMIAN PERIOD.

ROCKS—KINDS AND DISTRIBUTION.

It has been stated that the Upper Barren Measures of Pennsylvania and West Virginia, having a thickness in Monongalia County of 1044 feet, were of the age of the Permian period, though continuous in bedding with the strata below. Similarly, the upper beds—clayey beds, sandstones, with some impure limestones—in the Coal-measures of Kansas, Missouri, Illinois, Nebraska, and Texas, are referred to the Permian. The same is true for an upper part of the Coal-measures of Nova Scotia, New Brunswick, and Prince Edward Island. The evidence of Permian age consists in the presence of remains of plants, Mollusks and Vertebrates, like those of the foreign Permian. Permian beds have also been identified in the region of the Colorado Cañon in Arizona and Utah, where 845 feet of limestone and shales containing gypsum, overlying Carboniferous limestone, are referred to this period. In the Wasatch, the beds have a thickness of 600 feet.

Permian beds were identified in the San Francisco Mountains by Marcou in 1853 ; and in the Guadalupe Mountains, New Mexico (a white limestone), by B. F. Shumard in 1858. About the Colorado Cañon they have been studied by Walcott (in 1880) and others. The rock in the Wasatch is the "Bellerophon limestone" described by King (1878). Permian was identified in Nova Scotia by Dawson in 1845 ; in Kansas, by Meek, Swallow and Hawn, in 1858 ; in Illinois, by Worthen, in 1858 ; and soon after in Missouri and Nebraska by Meek ; in Pennsylvania and West Virginia, by Fontaine and I. C. White, in 1880. Cope's observations in Illinois and Texas were made in 1875, and later ; C. A. White's, in Texas, in 1889. On the Kansas Permian, see, further, Prosser's paper of 1894.

The Texas Permian occupies the western portion of the Carboniferous area. North of the Brazos River the lower beds, in the Wichita of Cummins, are red clays and sandstones, with some impure limestone at top. The fossils described by C. A. White are from this part of the series, and so also the Vertebrates described by Cope. Above are the so-called Clear-Fork and Double Mountain division, and then come the Dockum beds, different in rocks and fossils, which are referred to the Triassic.