

covered by a series of tertiary deposits, consisting of sand, sandstone, clay, and lignite, constituting what is termed a *brown coal formation*. On these strata an extensive layer of gravel is superposed, over which is spread a loosely coherent, sandy loam, provincially termed *loess*, which contains recent species of terrestrial and fresh-water shells, and forms the subsoil of the vast plains in which Bonn and Coblenz are situated, extending as far as the falls of Schaffhausen.

48. BROWN COAL FORMATION.—As the usual condition in which bituminized vegetable matter occurs in the tertiary formations, is well exemplified in the brown coal, or lignite, of the Rhine, it will be instructive to examine the characters of this deposit somewhat in detail; for we shall thereby obtain data which will prepare us for the investigation of the ancient carboniferous system. This formation, which is spread over a great extent of country on both sides of the Rhine, consists of clay, sand, sandstone, conglomerates, clay and ironstone, and lignite, or bituminized wood of various qualities, disposed in distinct beds, and intermixed with argillaceous matter. The breadth of the ridge of low hills formed by this assemblage of strata on the left bank of the Rhine, is from three to five miles, its elevation varying from 50 to 200 feet.

The lignite occurs in the following states:—

1. A black earthy and pulverulent substance. 2. Con-