

In the coal-measures, *pottery clay* occurs immediately below the vegetable soil. Its colour is bluish or smoke-grey, and sometimes yellow approaching to orange, in consequence of a mixture of iron ochre. It is used in the manufacture of coarse earthen-ware, bricks, and tiles.

The trap rocks occurring in connexion with the coal-measures, whether as dykes, overlying masses, or beds, will be noticed in a separate article in the Appendix.

*The minerals that accompany the coal strata are the following*; clay-ironstone forming thin beds or nodules in the strata of shale; in the nodules of clay-ironstone are found galena and iron pyrites; and the latter is found in great abundance crystallized and disseminated in the beds both of coal and of shale. Calcareous spar is common, either blended with the coal, or in the form of stalagmites.

*The organic remains found in the coal strata are*, according to Messrs. Winch & Thomson,—In the shale, the impressions of several plants, amongst which is a variety of fern. Another fern or two is found in the nodules of clay-ironstone, as well as impressions of cones. Impressions of the bark of a plant resembling euphorbia, in iron pyrites, are found in several collieries; of another plant in coal: vegetable impressions in sandstone: the cast of a cane-like vegetable: an aggregate of black quartz crystals diverging from the centre, having the interstices filled with yellow ochre; it is supposed to be a mineralized tree, and is found at Bigge's Main colliery, and often in large masses on the sea-shore. Bivalve shells, like those of the freshwater muscle, in dark grey ironstone, and in black shale and ironstone: the same in black shale in Hebburn colliery, at the depth of 780 feet.

In one of the sandstone strata, termed *fire-stone*, a tree has lately been discovered, 28 or 30 feet in length. The trunk and larger branches are siliceous, while the bark, the small branches, and the leaves, are converted into coal; and it is believed, that the small veins of coal, called by the miners *coal-pipes*, owe their origin universally to small branches of trees. It is stated by Mr. Winch, as a remarkable and interesting fact, that, while the trunks of trees in the Whitby alum-shale are mineralized by calcareous spar, clay-ironstone, and iron-pyrites, and their bark is converted into *jet*; those buried in the Newcastle sandstones are always mineralized by silex, and their bark is changed into common coal. (Ann. Dec. 1817. p. 68.) In the introductory chapter a more precise account of these remains will be found.