

wood-coal and common coal bear in other respects too close a resemblance, to allow us to ascribe to them a different origin, though they were probably formed from different tribes in the vegetable kingdom, and under different circumstances.

*Wood-coal** is found in considerable quantities at Bovey Heathfield, near Exeter. Several beds of coal are separated by strata of clay and gravel: the lowest is seventeen feet thick, and rests on a bed of clay, under which is sand resembling sea sand. The coal in contact with the clay has a brown colour, and appears intermixed with earth. In other parts the laminæ of the coal undulate, and resemble the roots of trees: in the middle of the lowest stratum the coal is more compact, and is of a black colour, and nearly as heavy as common coal.

A great repository of this kind of coal exists near Cologne: it extends for many leagues: it is fifty feet in thickness, and is covered with a bed of gravel, from twelve to twenty feet deep. Trunks of trees deprived of their branches are imbedded in this coal; which proves that they have been transported from a distance. Nuts which are indigenous to Hindostan and China, and a fragrant resinous substance, are also found in it. A similar resinous substance occurs in the Bovey coal, and was also discovered with fossil wood, in cutting through Highgate Hill. Mr. Hatchett, by whom it was analyzed, has given it the name of *retinasphaltum*.

In wood-coal we almost seize nature in the act of making coal, before the process is completed. These formations of coal are of far more recent date than that of common coal, though their origin must be referred to a former condition of the globe, when the vegetable productions of tropical climates flourished in northern latitudes. The vegetable origin of common mineral coal, appears to be established by its association with strata abounding in vegetable impressions; by its close similarity to wood-coal (which is undoubtedly a vegetable product); and, lastly, by the decisive fact, that some mineral coal in the Dudley coal-field is composed entirely of layers of mineralized plants.

But though the vegetable origin of mineral coal may be satisfactorily established, there is considerable difficulty in conceiving by what process so many beds and seams of coal have been regularly arranged over each other in the same coal-field, and separated by strata of sandstone, shale, and indurated clay. It will tend to simplify the enquiry, if we examine a coal-field of very limited extent; such as those which occur in small coal-basins called *swilleys* on the hills in the West Riding of Yorkshire, and which are not more than one

* The description of wood-coal ought to be given in the account of the tertiary strata and diluvia, but it offers many circumstances which tend to elucidate the formation of mineral coal.