

and owing its compactness to the peculiar circumstances under which it has been formed, the changes it may have subsequently undergone, and the substances intermixed with it. The power of yielding naphtha by distillation, is the distinction between one end of the series and the other. The last link (anthracite) contains only carbon; so the last result of the distillation of asphaltum is also carbon.

To convert wood-coal or jet into true coal, some further process than long submersion in water seems necessary. The latter substance, jet, was reduced to powder by Dr. M., put into a gun-barrel, and covered with Stourbridge clay; it was then exposed to a moderate red heat. By this process, it was converted into a substance having all the external characters and chemical properties of true mineral coal, and the clay was converted into coal shale. But though, in the laboratory of the chemist, the last stage of the formation of coal requires artificial fire, yet in the great laboratory of Nature, vegetable fermentation and compression may evolve sufficient heat, for the ultimate formation of mineral coal. It may however deserve notice, that most great repositories of coal are intersected by beds and dykes of basalt, which is now admitted to be of igneous origin.*

Pressure and time may be alone sufficient to produce the destruction of vegetable organization, and the perfect consolidation of beds of coal, as is proved by the complete consolidation of loose materials left in coal mines, when the supports are removed, and the upper strata sink down. In a few years, scarcely a trace of former operations remains. In contemplating natural causes, we are too apt to measure their power by the results of artificial processes, and by observations continued for a short portion of human life. The substances found in the neglected vessels of the chemist, often prove to us that changes in the physical properties of bodies are effected by time, which it would be difficult to imitate in common experiments.

The great regular coal formation appears to be confined to the lower secondary strata, generally resting on transition limestone. In some situations the under transition rocks are wanting, and the series of coal strata rests on granite, with the intervention of a thick bed of conglomerate.

No mineral coal, both good in quality and abundant in quantity, has ever been found either in the primary or in the lower transition rocks or in the upper secondary or the tertiary strata. It is true, that in the oolite of the upper secondary strata, two series of coal strata occur on the eastern moorlands of Yorkshire, which are thought of sufficient importance to be worked; but the coal is very indifferent, and is used chiefly by the lime burners. This coal formation will be

* At Meisner, in Hesse, a thick bed of wood-coal or lignite is covered by an enormous mass of basalt, and is separated from it only by a thin bed of clay. The upper parts of the lignite are converted into anthracite, and even into true bituminous coal, while the lower parts are formed of earthy and fibrous wood-coal.