

animal life. The means by which nature decomposes these elements, or reconverts them into a solid form, are not sufficiently known; but if the end could be accomplished by mechanical force, it is almost certain that the power necessary to produce it would at least equal that which was generated by the original combustion. Man, therefore, does not create power; but, availing himself of his knowledge of nature's mysteries, he applies his talents to diverting a small limited portion of her energies to his own wants; and, whether he employs the regulated action of steam, or the more rapid and tremendous effects of gunpowder, he is only producing on a small scale compositions and decompositions which nature is incessantly at work in reversing, for the restoration of that equilibrium which we cannot doubt is constantly maintained throughout even the remotest limits of our system.

The operations of man participate in the character of their Author; they are diminutive, but energetic during the short period of their existence; whilst those of nature, acting over vast spaces, and unlimited by time, are ever pursuing their silent and resistless career.—*Babbage.*

#### GEOLOGY.—COAL FORMATION.

This valuable production consists of carbon in the proportion of sixty, and bitumen in that of forty parts. The newest formation is considered to be that of alluvial soils, where the strata are not paralled. The next in age is the newest floetz trap, the result, as Werner supposes, of deluges. The coal of this class is generally covered with clay or basalt, and contains no vegetable impressions or remains.

The independent coal formation is considered to be the oldest, as the beds are unconnected. The strata are remarkably parallel, and overspread with indurated clay or shale. It contains

numberless impressions of vegetables, and sometimes of fresh water shell-fish. Of this kind are the great coal deposits of England.

Between the strata of coal occur one or two of sandstone, clay, bituminous shale or rubblestone, argillaceous ironstone, or limestone.

It is observable in every country, that though the shale above the coal contains impressions of vegetables or fish, the strata of the subjacent substances are destitute of them. Although the strata are generally parallel, yet they are frequently interrupted in other directions by slips, sinkings, &c., called *Troubles*, resembling cracks or fissures, filled with sand, gravel, and other deposits. Sometimes they are divided by vertical veins of basalt called *dykes*, which separate the strata without altering their direction. Close to the dykes the coal appears as if it had been pulverized, and even decomposed.

The dislocations of the coal strata are also termed *faults*, which are generally advantageous, though they partially interrupt the miner's operations; for fractured strata are often bounded by faults which arrest and prevent an overflow of water.

Coal occasionally contains metallic substances, as native silver, sulphuret of lead or of mercury, and antimony; pyrites, however, or the sulphuret of iron is the most common.

The vegetable remains, particularly the stems of plants in coal measures, are frequently of great size. In the quarry of Craighleith one of forty-seven feet in length was discovered, having its bark converted into coal. Many of the plants indicate a climate of excessive heat, and it is said that the vegetation is not continental but insular.

Buffon states that there are no fewer than 400 collieries in France: that at Namur is the deepest in the world, being 2,400 feet. Our coal, however, is unquestionably superior in quality to all other, and occurs in greater quantities.