

it overlies it, has deprived the upper coal of its volatile ingredients, while its influence has not always extended to lower seams. In some spots, the conversion of coal into coke seems to have been brought about, not so much by the heating agency of the intrusive basalt, as by its mechanical effect in breaking up and destroying the integrity of the beds, and rendering them permeable to water, thereby facilitating the escape of the gases of decomposing coal.

In conclusion, I may observe that I was much struck with the general similarity of this more modern or Oolitic coal-field, and those of ancient or Paleozoic date in England and in Europe generally. I was especially reminded of the carboniferous rocks near St. Etienne, in France, which I visited in 1843. These also rest on granite, and consist of coarse grits and sandstone derived from the detritus of granite. In both coal-fields, the French and the Virginian, upright Calamites abound; fossil plants are met with in both, almost to the exclusion of other organic remains, shells especially being absent. The character of the coal is similar, but in the richness and thickness of the seams the Virginian formation is pre-eminent. When we behold phenomena so identical, repeated at times so remote in the earth's history, and at periods when such very distinct forms of vegetation flourished, we may derive from the fact a useful caution, in regard to certain popular generalizations respecting a peculiar state of the globe during the remoter of the two epochs alluded to. Some geologists, for example, have supposed an atmosphere densely charged with carbonic acid to be necessary to explain the origin of coal—an atmosphere so unlike the present, as to be unfit for the existence of air-breathing, vertebrate animals; but this theory they will hardly be prepared to extend to so modern an era as the Oolitic or Triassic.*

During my visit to one of the coal-pits, an English overseer, who was superintending the works, told me that within his memory there had been a great improvement in the treatment

* See a paper on this coal-field, by the author, Quarterly Journal Geolog. Soc., August, 1847, vol. iii. p. 261, and an accompanying memoir, descriptive of the fossil plants, by Charles J. F. Bunbury, For. S. G. S.