frequently changed to hard quartzites, shales to cleaved slates, and limestones to a crystalline condition, as marbles. Often all the alteration is directly due to the presence of heated masses of intrusive rock, as granite, syenite or diorite, which have ascended from the heated interior along lines of fracture or least resistance, and the heat has deprived the rock in contact of much of the contained moisture, changing the texture and altering its character for a considerable distance from the line of contact of the intrusive mass.

As regards some of the more important minerals found in the stratified rock, their formation has proceeded on somewhat similar lines. Thus if we study the early history of the coal beds, some of which have a thickness of from thirty to forty feet, we find that they have originated probably from swampy deposits somewhat of the nature of our present peat mosses, and that the growth and decay of vegetable matter went on for very long periods. On the basis of eight to ten feet of peat or swamp mud being required for every foot of coal produced, a thirty foot coal seam would have required a swamp of enormous depth to have furnished the material necessary for the formation of such a coal bed. That the coaly matter has been derived from the decomposition of plants, such as tree ferns and other allied forms, which grew in the marshes of the Carboniferous time is very clear, since the remains of the coal-plants can be found well preserved in the shales which overlie the coals and in the clays which form their underlying strata, as well as in the tissue of the coal itself. It would appear that the woody or interior tissue gradually became destroyed, while the carbon of the bark principally formed the mass of the coal itself. These masses of swamp or peaty matter, gradually by submergence become overspread with sand, gravel or silt, which by continued increase in thickness acquired sufficient weight to press down the mass of bog, until by long continued pressure and other causes it became transformed into the coal which we mine and burn to-day.

Somewhat similar changes and conditions are going on at many places at the present time in our own peat deposits. Thus at the great bog near the city known as the "Mer Bleu" which is a great expanse of peat of from 8—10,000 acres in extent, the surface is covered with