gone on for ages as the numerous layers of coal, sand and clay indicate. The great weight of the covering matter compressed the layers of vegetable mould, and together with certain chemical changes brought about by decomposition, finally converted it into coal. How immensely thick these vegetable accumulations must have been may be judged from the fact that it is estimated it took between 30 and 40 feet in thickness to produce under pressure, one foot of coal. Imagine, then, at this estimate, what must have been its original bulk, when there are to-day many coal seams reaching a thickness of 30 feet or more. All this has been thoroughly studied out by the most eminent scientists, and there can be no manner of doubt about their conclusions. The earth or soil which supported this vegetation is still to be seen underlying the coal seams, filled with the roots and trunks of the trees. Frequently large stumps or portions thereof, are seen with their roots still attached, buried in the underlying soil, while their trunks project upwards into the coal beds themselves. So perfectly are these fossils preserved, that every feature of their structure can be distinctly made out. In many cases the woody fibre of the trees, in the form of charcoal, is clearly perceptible. Fossil botanists are thereby enabled to determine their botanical structure, and give a name to each individual species, with just as much accuracy as others can examine and name the living growth of the present time. I might here state that this vegetation of the coal period differs entirely from what we now behold. Such common trees and shrubs as the Fir Spruce, Pine, Larch, Birch, Alder, etc., had no existence. The only plants of our time at all resembling those of the above period are certain Fern trees of Australia, and some Bamboos or Canes, but they are not the same. It was thus, then, the coal layers, or seams, as they are termed, came into existence. These seams, upon analysis are found to be composed chiefly of carbon and certain volatile substances such as bitumen oil, gas, etc., mixed with a greater or less proportion of earthy matter.

Perhaps a clearer idea of the process by which coal seams were formed, might be conveyed by a consideration of the well known peat-bogs, so abundant in our country. These are simply vegetable accumulations on the surface of the earth, composed chiefly of club mosses, spagnum and other simple forms of vegetation in a state of decomposition. Could these peat-bogs be subjected to the same forces that were at work during the carboniferous period, such as great pressure under a thick cover of sand and gravel, aided by internal decomposition, they would eventually become coal.

Various attempts have been made, as you all are aware, to effect this by artificial means. What Nature in her grand laboratory accomplished long ago, insignificant man has attempted, and although fuel of a fairly good quality has been turned out, it is scarcely possible, that real coal can ever be produced by human ingenuity.

The character of coal seams varies very considerably. They range from soft dull coloured, highly bituminous (cannel) or soft coal, to the hard, shining, black Anthracite (or hard coal) as it is termed. When the carbon contents reach 60 per cent, and bitumen nearly half as much more, the combination produces a good household coal. When higher in carbon, with a less amount of bitumen, it produces good steam coal, provided it is fairly free from deleterious substances, and when still higher in fixed carbon, with quite a small percentage