

that the coal is of vegetable origin, and much of it from tree-like vegetation. With other observations we detect, many times, innumerable spores scattered through the coal. These are cells produced by vegetation which is flowerless. They answer for the fruit, but are not fruit, as the term is usually employed. The coal vegetation, therefore, was without flowers or fruits. Much of it, as we readily discover, was of the nature of ferns—some of them tree-ferns, such as grow in our times, in some tropical regions. If we were to search further we should find traces of vegetation resembling our Horsetails and Ground Pines. So we may regard ourselves quite justified in concluding that the coal which blazes and cheers on the grate, was once in the condition of a flowerless tree, rooted in an ancient soil, spreading its green fronds to the sunlight, decomposing the carbonic acid of the atmosphere, fixing the carbon in its own tissues, and setting oxygen free.

So, the sun was shining in the heavens so long a time ago. The plans of vegetable structure were in existence, and the forces of vegetable growth. How long have those plans endured! How imperishable are the thoughts embodied in those plans, and expressed by them! The tree stood upright in the soil; it drank in water by its roots, and bathed its foliage in the primeval air. It built its stem and fronds with fibers and cells like the modern fern. The sun stimulated it into action. The sun's warmth imparted strength to discharge its functions. The sun's emanations of light and heat became transformed into stem and frond and tissue. Whatever vicissitudes that growth may since have undergone, the same eliminated carbon is there; much of the same tissue form is there; it is the same transformed sunlight that it was millions of years ago. It is ancient sunlight that has been locked up like a treasure and buried in the earth for ages. Here, in this flame, the tissue-substance goes back to its primeval condition—it becomes again carbonic acid, and mingles again in the atmosphere from which it was selected. Here, in this flame, the old warmth reappears; it is the warmth of the sun which shone in the Carboniferous Age. Here, in this flame, the old sunlight is