The Origin of Coal

by Jean Henri Faber

"Coal is a fuel of inestimable value. By the heat which it develops in burning it gives movement to divers machines. It makes the locomotive move over the iron rails and the steamship traverse the ocean. With its aid metals are worked, fabrics woven, pottery is baked, glassware manufactured, newspapers and books are printed, tools are shaped, and all sorts of instruments necessary to our daily activities are produced. The arts and crafts have no more powerful auxiliary. If we had to substitute the heat of wood for that of coal, our forests would prove insufficient.

"What, then, is the origin of this combustible, which feeds an immense industry and is the source of incalculable riches? Ordinarily a piece of coal has no great interest for the eye. It is black, lustrous, formless, friable, without any definite character to afford us instruction. One can learn more from the fragments of refuse rejected by the miner as too poor in carbon, fragments in which the predominating element is a kind of dark stone that splits in sheets. In these a surprise is lurking that will tell us the secret of coal.

"These laminate blocks, stone rather than coal, show us, on the slabs that have just been separated by the blow of the hammer, various wonderful designs in which we recognize without hesitation the imprint or mold of some form of vegetation. There is no mistake about it; a plant has left its remains there; we behold in very truth the leaf with its subdivisions and its veins. It is all there, even to the minutest detail. It is really the leaf minus the green color, for which is substituted the black of the coal. We should not obtain a more exact representation if we ourselves took the imprint of some sufficiently firm leaf on a soft plaque of clay.

"Pending the time when some lucky chance shall bring you into the neighborhood of a coal mine where you can obtain a laminate block that you can split into sheets and thus discover for yourselves the vegetable imprints there concealed, here is a picture that will show you what these curious markings look like.

"What do you think of it? Have we not here what seems to be actual leaves, and very elegant ones too? They are spread out with a care that would appear to indicate the work of a painstaking human hand. Yes, these are real leaves, but turned to carbon and firmly incrusted in their bed of black rock.

"Similar imprints are found in great abundance in all coal mines. Certain coal-deposits, several meters thick, are composed entirely of them, the smallest chip that one splits off bearing on each face the markings of foliage. The whole is nothing but an accumulation of leaves and broken tree-trunks. An entire forest, heaped up in one pile, would not present an equal mass. Thus it is demonstrated that in coal are preserved the remains of ancient vegetation.

"During great floods the rivers of former ages swept away in enormous masses the trees they had uprooted along the banks, together with the foliage washed into the current by the heavy rains; then all this refuse was deposited in the mud at the river's mouth, or in some lake or bay. Thus were amassed here and there, under the water, during a long series of centuries, the remains of primitive forests.

“Fine clay became packed about these masses, molding itself with delicate accuracy around even the smallest leaf; the weight of the superimposed mud crushed the softened tree-trunks; a gradual decay converted the whole into charcoal; and finally the ligneous mass became a layer of coal. Later the waters changed their bed, driven elsewhere by upheavals in the surface of the earth, and the previously inundated bottom-lands became solid ground in which to-day we find coal under massive strata of rock.

“Is it possible to distinguish the forms of plant-life whence has come our coal? Yes, it is possible, so well preserved are the details of that life in the products of our mines. Now an examination of the imprints left to us in the laminæ or leaves of our stone book shows us that the plant-life of those remote ages in which the coal was accumulated bore not the least resemblance to that of our present forests. And this difference was to be expected. The animal life has changed; why, then, should the plant-life have remained unaltered?”

“Didn’t they have trees then like ours?” asked Jules.

“No,” replied his uncle; “we do not find in our coal mines any signs of the existence of trees resembling those of our day. Nowhere in the world, in fact, are there now to be seen any such forms of plant-life as flourished so abundantly in those remote ages; or if any still exist that are at all analogous, they must be sought in the islands of the tropical seas. No vegetable growth of that coal epoch, whether tree or bush or simple cluster of leaves, bore flowers. The splendors of the corolla were not to appear until a later period.

“For the most part there were only tall stems or stalks, without branches, of equal size from top to bottom, and furrowed with channels or dotted with large points arranged in spiral lines. At the top a tuft of enormous leaves balanced itself, the under surface of each leaf bearing elongated or rounded swellings containing a fine brown dust, each grain of which was a seed for the propagation of the plant.

“Plants that thus bear their seeds, or spores, in powdery masses on the under side of the leaves are called ferns. A number of species flourish in our part of the world. They are unpretentious plants, fond of shade and coolness. Old damp walls, rocks that drip water drop by drop, the darkest corners of our woods—these are the customary haunts of the fern.

“A short underground stock and a sparse cluster of leaves, very elegantly shaped, it is true, constitute our native ferns. Those of the coal epoch were of a different pattern. Some of them displayed at the top of a stem as tall as our poplars a cluster of leaves five or six meters in length. They are called tree-ferns, and they contributed the greater part of the coal-forming material.

“The accompanying illustration will give you an idea of what the vegetation of that period must have looked like. What strange trees! How different from our oaks and maples and hemlocks! The soil is a liquid mud in which lie and rot the tree-trunks prostrated by the weight of years; the air is sultry, moist, heavy, strongly impregnated with a moldy smell; and the density of the foliage barely admits a few sunbeams to flicker over the surface of the stagnant pools.

“Everywhere profound silence. No song of bird bursts forth from the foliage of those tall fern-trees, for the bird is not yet in existence. No foot of quadruped treads the ground, for the quadruped with its coat of fur will not come until much later. Some lizards lurking in the rock-fissures, some large dragon-flies at the water’s edge, some odious scorpions under the heaps of dead leaves—that is all the

animal-life to be found in the forests that gave us our coal."

Source:

Faber, Jean Henri. "The Origin of Coal". *Field, Forest and Farm*. New York: The Century Co., 1919. 336 – 341. Electronic.