

## T H E S I S .

Subject, Bituminous coal Geographically

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There may have been a time when people knew nothing or very little about coal. But there are very few now who do not know what the origin of the coal which they use so freely, and which in obedience to their demand has been brought up more than a thousand feet from the interior of the earth; there is no doubt we feel more or less thankful that such a store of heat and light was long ago laid up in this earth of ours for our use. We can scarcely imagine the industrial conditions of our country in the absence of so fortunate a supply of coal.

Coal is the mineral which has resulted, after the lapse of thousands of thousands of years, from the accumulation of vegetable material.

caused by the steady yearly shedding of the leaves from the forests which existed in an early age; this decayed material formed in the first place, perhaps, beds of peat; these beds have since been subject to an ever increasing pressure of accumulating strata above them, compressing the shavings of a whole forest into a thickness in some cases of a few inches of coal, and have been acted upon by the internal heat of the earth which has caused them to part with some of their gases which helps to form them.

In considering the sources whence coal is derived, we must remember that coal itself is but a minor portion of the whole formation in which it occurs.

Geologically speaking, the car-

boniferous formation of coal occurs near the close of that group of systems which have been classed as "palaeozoic," younger in point of age than the well known Devonian and Old Red Sandstone strata.

The thickness of single seams varies from that of a knife-blade to over a hundred feet, the largest of occurring in Pennsylvania and Southern France.

It is impossible to realize completely the significance of the coal beds in themselves unless there is a knowledge of the remaining composing parts of the whole formation.

The strata found in the various coalfields differ in a large degree among themselves in character but as we are particularly interested in

the "Upper Productive Coal Series," or Monongahela River Series, I will mention the strata of this Series only. They are as follows: - Shale, sandstone, limestone, and fire-clay alternating with coal-beds which may reach a proportion of one to twenty.

It is noticeable that the various seams of coal in this region deviate but little from the horizontal; consequently the coal is easily taken out and the mines are self-drawing, the dip is so gradual that starting on the southern line of the state, on the Upper Monongahela the seam, in about fifty miles, attains an elevation of at least three hundred feet above the river, where the coal crops out on the top of the hill. Now comes a break on a line running

east and west, and the seam,  
drops down to the water's edge;  
This is near the town of Brownsville.  
This striking feature arrested the  
attention of the celebrated English  
geologist Sir Charles Lyell, when  
he visited this locality as a scient-  
ist. After expressing his astonish-  
ment at the magnitude of this  
seam of coal, he says, horizontal  
shafts may be driven everywhere  
at very little expense, and so worked  
as to drain themselves, while the  
cars laden with coal and atta-  
ched to each other, glide down on  
a railway so as to deliver their  
burden into barges moored to the  
river's bank. No doubt Sir Charles'  
amusement was increased as he  
compared the ease with which this

coal is mined with the difficulties of mining coal in his native land, where the seams are scarcely more than four feet in thickness, and the dip is so great that already a depth of from one thousand to two thousand six hundred feet has been reached and thereby increasing the labor of digging and hoisting the coal.

The gradual rising of the main coal seam is repeated, for, starting from the river's edge at Brownsville, where it dropped, it gradually rises, and, forty miles distant crops out three hundred feet above the river on the hills just south of Pittsburg.

On the upper Monongahela ninety miles south of Clarksburg, a seam of coal eleven feet thick

was passed through while boring for saltwater; this was far below the river, while above it, in the hill side are several seams, one above another. In 1886 while drilling for gas in the vicinity of Fayette City about forty miles south of Pittsburg, the drill passed through a seam of coal nine feet in thickness, and at a depth of six hundred feet below the river.

Coal is found along the upper Monongahela, in West Virginia, and its tributaries especially in the vicinity of Clarksburg, here the main seam is from ten to twelve feet in thickness, below which is still another, somewhat thinner, but of a coal more highly bituminous.



Bituminous coal mines are thickly dispersed all along the Monongahela river and upwards of 4 000 000 tons are shipped annually by river alone to the markets along the Ohio and Mississippi rivers to New Orleans. From these coal fields come the coals which are manufactured into coke in the great Connellsville region.