Coal; Prehistoric to 1938

ONE OF THE LINES OF PRODUCTION IN WHICH WELD COUNTY STANDS AT HEAD OF THE STATE.

There was a time not so many years ago when Weld County languished far down the line of the state's producers of coal, but when she finally struck her stride she forged ahead and in 1931 stood at the head of her class.

In the Colorado Year Book of 1932, page 240, the statement is made by Clark B. Carpenter, Associate Professor of Metalurgy in the State School of Mines, that Colorado's resources are greater than those of any other state in the Union. Added to this is the statement of the State Mine Inspector, (found in same book, Page 241) that the resources of Weld county are believed to be greater than those so far known, of any other county in the state. This statement is well qualified by the words "so far known," for it is always possible that some other county may discover deposits hitherto unknown, just as Weld has done, that may transfer the proud distinction of first place to that other county. When—and if—that happens Weld will cheerfully yield to the winner; but at present that honored place belongs to Weld.

It is well known in a general way that there was a considerable coal production in Weld dating back to early colonial days; that veins were found on farms in the Greeley district and elsewhere, and, even that there was a Union Pacific Coal Company that transported coal by rail as far back as 1873. But there being no official or definite record of that time this History will have to start in at about 1885 when records began to be kept.

From reliable state records of that time, the period between 1885 and 1890 had a production of 8,450 tons, and the following years showed a steady increase. In the five year period between 1890 and 1895 production multiplied by six, and a little over, the figure standing at 50,822 tons. Between 1895 and 1900 the proportion was not so great but the total increase quite satisfactory, standing as it did at 89,871 tons. Then from 1900 to 1905 it almost trebled, marking up to 137,039 tons.

From 1905 to 1910 it more than multiplied by five, and from 1910 to 1915 almost trebled again, standing at 2,038,954 tons; then from 1915 to 1920 it rose to 3,262,954 tons, and between 1920 to 1925 more than doubled that figure with 7,287,097 tons. The next five year period, between 1925 and 1930 it added something like two millions to the product, with a total of 9,336,545 tons. It was within this period that the highest single year producion was reached, which was 1929 when the figure stood at 2,177,517 tons. Then production began to fall off, the four years between 1930 and 1934 showing a total of but 5,974,087 tons.

Here the question arises why production should fall off with deposits still available; and the answer is found in three different developments; the coming of natural gas, the introduction of oil plants for heating purposes and the improved methods for the extraction of heat units from coal.

Natural gas was discovered and used in the state as early as 1892; first in Florence, Fremont county, and later in Los Animus, Moffat and Larimer counties, but did not begin to displace coal for domestic and manufacturing purposes in Weld county until about 1928 or 1929 when it entered the northern district from Amarilla, Texas. Now Colorado both exports and imports gas; imports from Texas and New Mexico and exports into Wyoming.

Oil as a fuel has not as yet displaced coal to a great extent, but what it has already done may be prophetic of the future.

There are many improvements in engines and furnaces, and even in house heaters and ranges designed to economize coal, and still greater improvements are promised for the future; all of which will have a tendency to make statistical tables seem to show a falling off in production of coal. But this will only mean that better methods of heat extraction are coming into use.

This instead of being discouraging should be re-assuring to those who have feared a coal-famine in the coming years, since it only serves the conservation of coal. However, according to the statement of R. D. George, State Geologist, there never was much danger of a coal famine any way. In his book, *Common Minerals and Rocks*, page 64, he says that at the present rate of

consumption Colorado alone could supply the whole United States for about 750 years; and the state alone about 31,000 years. By that time, perhaps, even the youngest of us will be where we will not need the heat of coal. Or, a more cheerful prospect, the world will have learned how to can up the heat of the sun in summer, and coal will no longer be needed.

Mr. Carpenter, previously quoted, states that Colorado has enough coal already discovered but unmined to hold her in first rank as a producing state for an indefinite number of years; and that Weld county has 1,049 acres of coal lands in production and as many as 5,880 acres of deposits known to exist but not yet mined.

In the Bulletin from which we are quoting, *Rocks and Minerals*, by R. D. George, between pages 94 and 95, is a chart giving the location of coal deposits in this part of the state. It is shown as a compact and continuous bed running across parts of Weld, Adams, Arapahoe, Jefferson, and Douglas counties and on down into El Paso county. As the picture lies on the map it bears a shape something like a crude drawing of a horse, with merely a body and without legs, ears or tail, the head and neck in Weld county jutting over the line into Boulder, and the rest of the body shaping itself southwestward through the other counties, giving Weld a greater area than any other single county, though not so great as all others taken together. Since this picture was drawn and its outline fixed, later discoveries have somewhat changed the outline, but the bulk of deposits still hold at about the same proportions in the counties.

Weld county has no gold deposits, at least so far as known; but is in no way envious of counties that have; for coal is more valuable than gold, not only intrinsically but in actual money value as well. Up to 1931 gold held first place as a wealth producer, but in that year gave up to coal; and coal still holds the lead. In 1931 the gold of the state was valued at $720,245,420 and coal at $729,816,680, giving coal the lead by $8,571,260. This statement is from the *Year Book* of 1932.

MINES OF WELD COUNTY

The Assessor's office kindly furnished a complete list of the actively producing mines of the county; they are here given, not in the technical terms of location on file in that office, but only in reference to their location in the county. They are almost all in the south-western part of the county, and many near Erie in the extreme southwest corner. In this locality are:

The Monroe, Columbine, Boulder Valley, Clayton, Morrison and New Graham. Those nearer Frederick are: the Sterling, Bollen-Combs, Liley, Russell, Grant, Puritan, Shamrock, Baum. Near Milliken and Beebe Draw are: the Buddy, Hubbs, Casselman and White Ash. Near Keota in the northeastern part of the county is the Keota Coal Company mine.

The last four named and also the Bollen-Combs are called wagon mines, being off the railroad and only reached by wagon or truck.

The Union Pacific Railroad owns a large block of undeveloped coal lands in the southwestern part of the county.

WHAT IS COAL, ANYWAY?

The answer depends entirely upon the point of view—or of contact—of the one answering. The exasperated housekeeper whose time and strength are dissipated in an endless and uneven battle to keep her house clean in spite of it, will answer:—especially if she came from a wooded country—"It is a dirty, black substance that the people in this benighted country have to use for fuel." But the scientist whose contact is from a much more comfortable and interesting angle will say—in language we may not understand so well—

"It is carbon, hydrogen and oxygen in proportions represented by the formula C-6, H-10, O-5. In the change from plant tissue to coal, carbon-dioxide, C O-2, Carbon-monoxide, CO, water H-2-O and marsh gas, C-2-4, are given off in such quantities as to increase the proportion of carbon and decrease that of hydrogen and oxygen, etc., etc."

And both answers will be correct.

There is not much to be said of the first answer. It begins

and ends in dirt, but furnishes the necessary heat to ward off the wintry blasts and, sometimes, to prepare the family food; so we will take up the second which, with all its mystifying terms is more interesting and enlightening.

The definition given above is quoted verbatim from State Geologist, R. D. George, who published Bulletin No. 6 on *Common Rocks and Minerals.* On page 89 he traces coal from its vegetable origin to its development into coal, and adds:

"This is the process by which the vegetable is changed back into the mineral: by the increase of the element of carbon and the decrease of the other two." And he proceeds further to show that this mineralization is still going on, and that its point of development is what makes the different grades of coal. For instance:

When the process has been going on only a few thousand years we have *peat;* a few more thousand and we have lignite; then on, the thousands giving way to the millions of years and we have *bituminous* coal; and after the measure of millions slips into what the scientist calls "ages," we have *anthricite,* and still later on *carbonite* and *graphite.* Then we quit counting and in course of time comes diamonds.

Here the orthodox imagination staggers a bit, wondering how all this is ever going to square up with the accepted theological measure of six thousand years as the age of the world.

And on this point Mr. George does not help the least bit; he only goes on to talk about how the "*growth* of mountains" had caused a "folding of the rocks" that contained the developing coal; and of how this "compression" created heat and hastened the process of development from the trees and ferns of the long ago to the "dirty, black," but tremendously important, substance we call coal.

And, to make matters worse, he asserts that while our supposed "eternal hills" were going through all these contortions the "molten rock" was being forced up from deep within the earth, up and into seams and veins and becoming coal. Sometimes this process is hastened a little too fast; in other words, the subterraneum fireman gets too hot a fire, in which case the

substance is burned up before it really reaches the stage of coal.

But even this apparent disaster may have had its compensations. If the fire down below, that is, in the interior of the earth, had been less hot, and the mountains had not grown so fast and the rocks folded up so completely, we might not have had any coal for a few millions of years yet; and maybe humanity would still be waiting for a planet to be made ready to live on. But this is drifting into a field where histories like this have no business to go; so let's change the subject somewhat and talk about—

WHAT IS IN A TON OF COAL.

In addition to dirt and heat this is what Mr. George says it contains:

Coke	1,100 to 1,500 pounds
Ammonium sulphates	20 to 30 pounds
Coal tar	50 to 80 pounds
Benzene	12 to 18 pounds
Gas	8,00 to 12,00 cubic feet

But that is where they just begin to find out what is in it. Various cyanide salts are made from the hydrocyanic acid found in the crude gas, the yield being from one to five pounds per ton.

From the ammonium sulphate is derived a very fine fertilizer, the tremendous value of which Mr. George thinks our farmers do not yet full appreciate. He states that the by-products of the salts of this element were valued, in 1910, at $3,-860,000 A part of the coal tar in that year sold for $1,600,000.

Quoting from page 97: "It would be impossible to give even a brief outline of the various and extensive industries based upon *coal-tar* as the raw material. It is used in part for fuel, for gas manufacture, for weather-proof and chemical-proof paint; for the manufacture of roofing-felt and lamp-black, and as a binder for "briquetting," (compressing) slack coal." But this is not even skimming the surface.

Coal-tar is a magic-maker. Out of it comes dye stuffs from the analine salts, over 300 in number; of perfumes and flavor-

ing extracts, a long list; medicines and pharmaceutical preparations such as carbolic acid, salicylic acid and its salts, disenfectants, antiseptics, anesthetics, etc. Also photographic preparations; creosote, and many other chemicals. The cyanide salts are used chiefly in metalurgy. When coal is burned these rare elements escape into the air. So, when we see a dense cloud of smoke rolling from a railroad engine back over the long train and being dissipated in air, we may think of the dyes, the perfumes and extracts, the medicines, etc., floating off into the air, never to be captured for the benefit and delight of human kind.

THE COKE OVENS.

There are three types of coke ovens: the beehive which saves none of the by-products; and two others called non-byproduct and by-product ovens. These, however, are retorts instead of ovens. The non-byproduct saves nothing outside the coke except the gas; but the by-product saves everything. This is a much more complicated and expensive oven to build, but pays far more abundantly in the end than either of the others. The plain beehive can be built for $300, while the by-product type costs at least $5,000.

Careful estimates by the U. S. Geological Survey shows that by-products wasted in the manufacture of coke amounts to tens of millions of dollars every year. Why, then, should the beehive oven be used at all? In truth this oven is being abandoned.

Truly coal is many times more wonderful and valuable than gold.