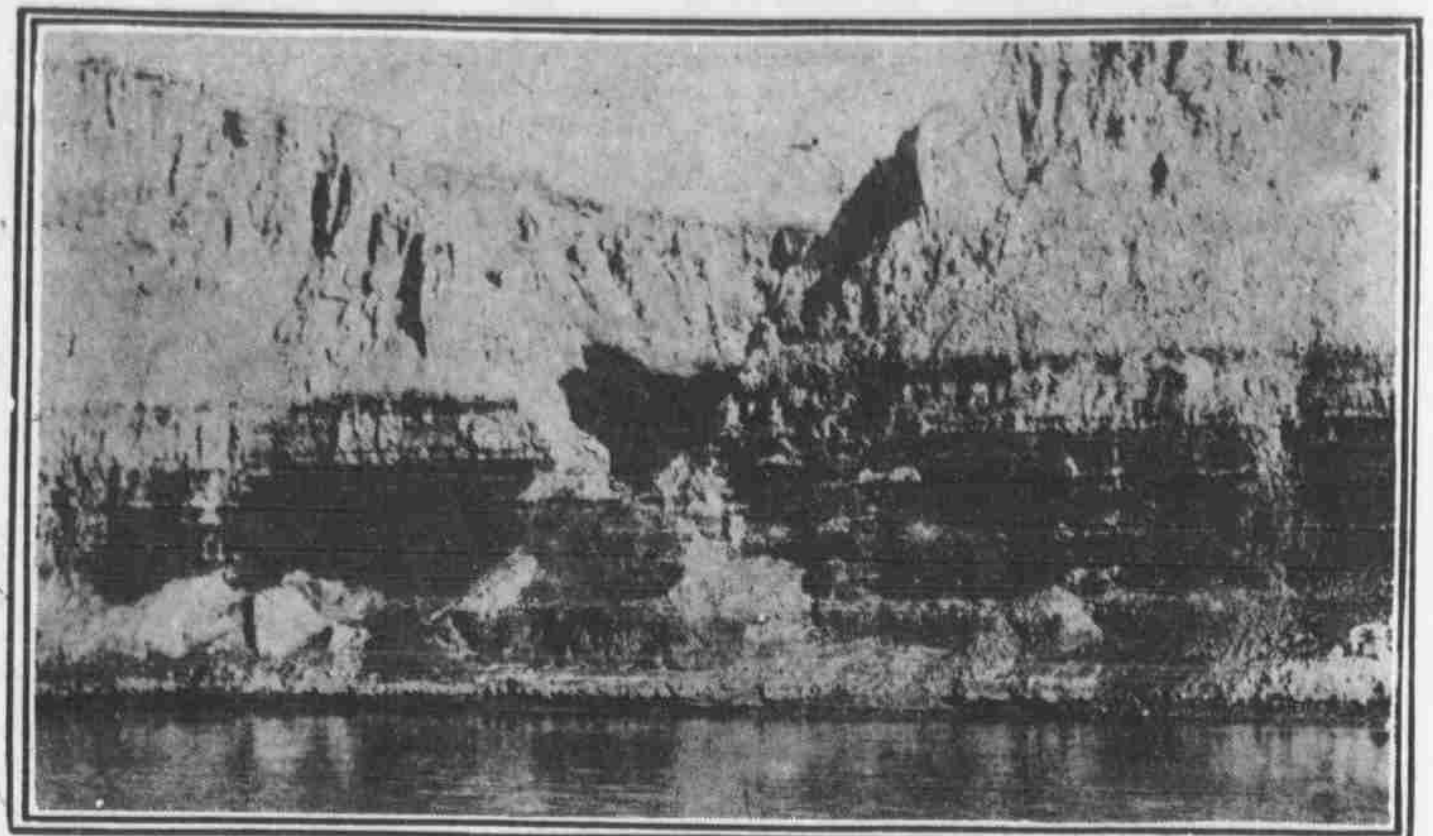


# How Uncle Sam's Coal Fields Are Prospected and Valued



GEO. OTIS SMITH  
DIRECTOR  
GEOLOGICAL  
SURVEY



LIGNITE BED IN NORTH DAKOTA  
AS BIG AS SOUTH CAROLINA

| COUNTRY             | 100,000,000 | 200,000,000 | 300,000,000 | 400,000,000 | 500,000,000 |
|---------------------|-------------|-------------|-------------|-------------|-------------|
| United States       |             |             |             |             | 480,450,042 |
| Great Britain       |             |             |             |             | 209,970,477 |
| Germany             |             |             |             |             | 226,772,605 |
| Austria-Hungary     |             |             |             |             | 43,555,315  |
| France              |             |             |             |             | 40,705,215  |
| Belgium             |             |             |             |             | 38,261,745  |
| Russia and Finland  |             |             |             |             | 23,557,981  |
| Japan               |             |             |             |             | 15,302,457  |
| India               |             |             |             |             | 10,107,230  |
| Canada              |             |             |             |             | 10,510,901  |
| All other countries |             |             |             |             | 30,462,075  |

COMPARATIVE COAL AREAS



A 7 FT. VEIN--YELLOWSTONE



BLACK PATCHES--ANTHRACITE-BITUMINOUS  
SHADED--LIGNITE

the Salt Lake City office we have received \$200,000 for such lands, and additional claims were filed that month by would-be purchasers aggregating \$200,000 more. The selling prices are fixed so that they will be attractive to the purchaser and at the same time will prevent the lands being bought and held, in order that the buyer may make a great profit out of the unearned increment thereon. The idea is to conserve the coal for the government and the people. The land office also issues patents for farm lands as homesteads, reserving the coal which lies beneath them.

"What sort of coal lands are the best investments?"

"At present the high-grade and more expensive lands are the better buys, although more of the low-priced lands are being sold. You see we have a considerable competition from the railroads that have received large grants of public lands as subsidies, and some of which own vast quantities of coal. The Union Pacific road has extensive tracts of valuable coal lands. I would say that the railroads are not anxious to sell at the government prices, and that our prices are as a rule below those asked for private coal lands in the same districts.

**The Old Plan and the New.**

"Can you give me an example of the old method of selling in contrast to the present plan?"

"Suppose we take one of the Wyoming coal fields," said the director. "Here is a township which at the old rate of from \$10 to \$20 per acre was valued at \$460,000. It is now priced at 1 cent a ton, according to its coal contents, and the value is just \$2,800,000, a difference of \$2,340,000 for that township alone. In another township in Wyoming the present valuation of the coal lands is a little more than \$6,000,000, whereas it was less than \$500,000 before, and a single square mile of that township had been valued at \$216,000"

**Surveying the Coal.**

"But how can the surveyors know just what coal there is in the land? Do they use diamond drills and bore down through every acre?"

"No," replied the director. "They can tell from the outcroppings of the coal on the mountains and hills, and the veins exposed in the canyons and valleys. If there is a bed of coal twenty feet thick in one canyon and we find a bed of the same thickness and same quality of coal some distance away with the other geological conditions, that would show that the two were a part of one and the same bed, we should conclude that all the land between the two contained coal. Our estimates are carefully made, and, as a rule, they are below rather than above the real amounts."

**The Depth of Coal Beds.**

"How deep do you fix the possibility of mining?"

"We estimate that at about 3,000 feet," replied the director. "I mean for coal. The lignite is estimated at about one-third that depth."

"How about lignite, is it of great value?"

"It will probably be worth far more in the future than it is now. We have altogether in the neighborhood of 150,000 square miles, containing about 390 billion tons of lignite, which is easily accessible. There are vast beds of lignite in northern Dakota, covered over with rich farming lands, and there are great beds in the south, including Texas and other gulf states. We have a lignite bed in North Dakota which is as big as the whole state of South Carolina. Its contents are estimated at something like 500 billion tons. Montana and New Mexico have large deposits of lignite and there are billions of tons of it in Alaska.

**Lignite Briquettes for the Railroads.**

"But have we had any practical tests of the value of lignite?"

"It is used largely in Europe," replied the director of the survey. "Germany consumes 15,000,000 tons of it annually, and in the shape of briquettes it is consumed on many of the European railroads. It is also employed there for domestic heating and gas making. Briquettes have been used experimentally on some of the railroads and we have a number of factories which are now making them. The briquettes burn without clinkers, and I have seen it estimated that if they should be substituted for coal on the railroads, the saving in our coal consumption would be something like 80,000,000 tons per annum. The geological survey has been making experiments as to briquette manufacture, and we have machines which will exert a pressure of 25,000 pounds to the square inch, forcing the lignite into briquettes without the aid of a binder, such as pitch or some other substance. Lignite coal can be used for gasmaking, and it will in time form a large source of the fuel supply for gas engines."

**The Coal Lands and the Deserts.**

"What will be done with the money that the government gets from its coal lands?" I asked.

"That is a very interesting feature in connection with the revaluation," said the director. "The greater part of the government coal lands lies in the states which are reclaiming the deserts, and this money will go to the reclamation fund. It will be used to make reservoirs in the mountains, dams for the rivers and canals to carry the water out over the land. It will enormously increase the area of irrigated land and will eventually result in the creation of thousands of farms. So far the proceeds of the coal lands have all been deposited to the credit of the irrigation reclamation fund.

FRANK G. CARPENTER.

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WASHINGTON, D. C., May 6.—(Special Correspondence to The Bee.)—I have spent this afternoon at the geological survey talking with Dr. George Otis Smith, the director, as to his new investigations of Uncle Sam's coal fields. His figures are so big that they dazzle the mind. The area of the known beds has been almost doubled within the last ten years, and it is now known to cover a territory twelve times as large as the states of Ohio, Virginia or Kentucky, or about one-sixth that of the United States proper.

Some of the new and undeveloped regions have beds thirty, forty, fifty and even eighty feet thick, and one single bed contains five or six billion tons. In the whole United States, according to the estimate of Dr. Campbell, made for the survey, the coal in the beds is more than 2,000 billions of tons, and of this more than 2,000 billion tons are accessible and easily worked. Dr. Smith says that our workable coal fields are four times as large as those of all of the country combined, and that our tonnage is twice as great as that estimated for the rest of the world.

**Uncle Sam's Big Coal Wall.**

You have heard of the great Chinese wall. I have seen it at several different places. It is about forty feet high and perhaps twenty feet wide at the top. It begins at the Yellow sea and runs across China for a distance of 1,500 miles. The wall would be a grain of sand or at least a single brick compared with the mighty wall that might be made of Uncle Sam's coal. We shall estimate the amount at only 30,000 billions of tons, taking only the workable and accessible coal into the calculation. If that coal were put out on the ground and laid up in solid masonry it would make a wall one-third of a mile high and a mile thick reaching from New York to San Francisco. Or suppose it be 600 feet thick, which is more than three times the width of Pennsylvania avenue in Washington or that of any of the largest streets of our cities, and make the wall three times as high as the Washington monument. We shall begin the construction at Boston and extend the wall westward. How far do you think it would go. Would it reach across the Pacific? Yes, it would extend from Boston to Shanghai in China, and from there over the whole of Asia and Europe, until it met the Atlantic ocean on the west coast of France. It would go on clear across the ocean to Boston, and there would be hundreds of millions of tons yet to spare.

But the Chinese wall was a useless attempt at defense to shut out the Tartars. This is a great industrial wall, which means the keeping of our factories busy and our houses warm for three or four thousand years of the ages to come.

This estimate of how long our coal will last is not Dr. Smith's. I tried to get him to tell, but he hedged. Said he:

"As reported by Mr. Parker, the survey coal statistics, the total production of coal in the United States up to date has been over eight billion tons, which, with the waste involved in mining, represents an exhaustion of about twelve billion tons. This is less than 1/4 of 1 per cent of the coal now known to exist, and it leaves us more than 99 per cent of our workable coal in the ground. The amount, as I have said, is about 2,000 billion tons, which means 4,000 times the amount we are now using each year, plus 50 per cent added as waste."

**A Million and a Half Tons Daily.**

"How much coal do we use every year?"

"Our highest production was that of 1907, when we used 480,000,000 short tons. That was about 1,500,000 tons every day. We are now using a little less, but it would take more than 300,000 trains of thirty cars each to carry the coal that we are annually mining, and the combined length of those trains would be between eighty and ninety thousand miles. They would make a solid train of coal reaching two and one-half times around the globe at the equator."

"But, Mr. Director," said I, "if we use less than 500 million tons a year, would not those 2,000 billions last us 4,000 years?"

"I don't want to talk about years," said the head

of another in the public land states. It must be remembered that a great deal of this is lignite, of such a low grade that it will be many years before it is mined.

"What is the character of the western coal?"

"It is of all grades. Some of it is anthracite and some of it is high-grade bituminous coal. We have considerable anthracite in Alaska, and also great quantities of bituminous coal which will make excellent coke and which, eventually, will be used largely in the industrial development of the Pacific coast states."

**How Uncle Sam Has Saved Millions.**

I understand that you geologists are re-surveying and revaluing the coal upon our public lands? Can you tell me how this is done?"

"The old way of selling the coal lands," replied the director, "was at so much per acre, regardless of the quality, or amount of coal it contained. The price was fixed at \$20 if the land lay within fifteen miles of a railroad, or at \$10 per acre if it were outside that limit. Our present method is to measure up the coal in each acre, and sell the land on a coal tonnage

**Where the Coal Lies.**

"Can you tell me just where our great coal fields are, Mr. Director?" said I.

"They are to be found in all but fourteen states of the union. They extend from northern Pennsylvania to Oregon, and from Canada to southernmost Texas. You can get the best idea of them from a map made for the survey by Dr. Campbell a couple of years or so ago."

Here the director sent for a map of our coal lands about four times as large as a page of this newspaper, and spread it out on his desk. As we looked at it he said:

"That great patch at the east is the Appalachian coal field, and those spots to the right of it, at the northern end, are the anthracite beds of eastern Pennsylvania. It is from there that comes the chief anthracite of the country. Those beds originally contained over nineteen billion tons of anthracite, and at the close of the year 1909 there were estimated to be over fifteen billion tons still in the ground. The Appalachian field contains much high-grade bituminous coal good for cooking, and it is by far the most important coal field of the union at the present time. A little further over is the eastern or Illinois coal bed. It covers an area as large as the state of Ohio, and on the other side of the Mississippi is another vast region underlaid with coal, while at the south are the coal fields of Texas. Our surveyors have recently investigated the coal fields of the northwest and the Rocky mountain plateau, and especially that upon the public lands, the title to which is still in the government."

**What Uncle Sam Owns.**

"Can you give me some idea of the coal lands which still belong to the government? What is their extent?"

"They cover an area of more than seventy or eighty million acres, and they contain an enormous amount. Some of the beds are twenty, thirty, forty and even as high as eighty feet in thickness, and in many of them there are several beds with clay or rock between them. In the Navajo reservation of Arizona we have the Black Mesa coal field, which is estimated to contain more than 5,000,000,000 tons, or more than all the coal that Pennsylvania has produced or wasted up to date. Altogether it is estimated that there are almost 2,000 billion tons of coal of one kind

## Pius X a Practical Reformer

**S**TUDENTS of human achievement may not entirely comprehend the intricate delicacy of the Vatican's attitude toward those countries that are steadily trying to throw off the yoke of the retrogressive and decaying system of family government, improperly called monarchical institutions. Pius X was long a parish priest and a keen observer. He will not tolerate an indolent or worldly clergy, and even cardinals in Italy having suburban sees are obliged to give them personal supervision—in other words, to be seen in Rome less and more often in their own dioceses. Rome has ceased to be a lounging place for clerics, according to Augustin McNally, writing in the New York World.

The meager cable messages making known the promulgation of some new decrees do not give an adequate idea of his character. To obtain that we must peruse the decrees themselves. They reveal a man of strong will, solid piety and a profound knowledge of his position and its obligations. He is bent upon making the world understand that everybody inside the church—priests and bishops, archbishops and patriarchs and the scarlet clothed members of its senate, students in seminaries, high and low in religious orders, and the great multitude of the laity—must observe its laws. Young men are not to be admitted to the ministry when their attitude is that of persons about to enter a profession rather than of those who esteem it a vocation; priests newly out of seminaries are not to harangue "the faithful" with flowery sermons and conferences upon subjects with which they themselves are not wholly familiar, and which, in general, are "better calculated to flatter the intellect than reform conduct." Sensational preachers are to be forbidden the privilege of the pulpit. Bishops must see to it that priests are quick to answer the call of the sick or the dying, and they themselves are ordered to give a more comprehensive account of their stewardship than has been the custom. These are but passing instances. And if we are to base our conclusion on the utterances of the pontiff there has been

need of a reformer of Rome. The pope's most recent decree forbids the clergy from engaging in any kind of commercial endeavor and they are solemnly warned against allowing the use of their names as guarantors for any project. What does this mean? It means, among other things, that a godly number of the clergy in Portugal, for instance, will have to be content with their usual salary and the stipends of the faithful for marriages, baptisms, deaths, etc. The Benedictines must close their brewery, the Father This and Father That Building and Loan association must get another name and—shades of all the Parisian eating places!—the poor Carthusians may no longer prepare those delightful white, yellow and green liqueurs.

Though these practical reforms may not seem weighty matters when viewed from the viewpoint of those who would have the simple pope rank among the eminent statesmen of the century, he regards internal reformation and the codifying of all the laws of the church as subjects of vital concern. His activities in this direction are marvelous. A president's message is brevity alongside of these long documents, teeming with wise reflections, a multitude of allusions, hundreds of citations as so many authorities for his attitude, now lamenting the utter indifference and laxity of some portion of his flock, again in forceful language announcing that such and such dangers must be avoided. Bishops shall do this, eschew that, and priests—they are forever in his mind; they are bound to be vigilant, watch incessantly over those placed in their care.

The pope is solicitous. He wants details. For instance, the bishops are ordered to make inquiry "whether the churches are free of access to the poorest, so that all may attend without discrimination or without being humiliated or inconvenienced." Interpreters of these documents claim that this clause appears to be a direct censure of the custom prevalent in this country of exacting a fee at the church doors.

"But can the government lands be sold at these high prices?"

"We are selling them. During a single month at