

Idaho's Coal Fields and Their Possibilities.

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THE fuel problem in Idaho is one of the most serious questions touching the future material development of the state; for while our territory is lavishly endowed by nature with a variety of natural resources, the one most important of coal resources is rather deficient in its development as at present 95 per cent of the total area of the state is occupied by volcanic or metamorphic metal bearing formations. However, recent investigation has shown that Idaho possesses a limited area of the most important coal bearing formations of the west, as far as known this coal bearing region is not to exceed 20 by 30 miles in extent and covers a portion of the eastern border of Fremont and Blaine counties, adjoining the Wyoming state line.

LIGNITE COAL DEPOSITS.
Deposits of lignite coal have been discovered in half a dozen different sections in the state, but with the exception of those at Salmon City, none have been disclosed so far of commercial importance in this line. The lignite coals are usually very high in ash and moisture, and while some of them may prove of considerable value as a source of domestic fuel, it is fairly likely that they will never cut much figure in a commercial way, as they are usually of very limited area.

The coal deposits of Blaine and Fremont counties are of the bituminous variety and are contained in a well developed series of cratonic coal bearing formations. Lower Laramie, without question a part of the rich coal bearing series of western Wyoming, and contain the characteristic fossils of that series extensively developed.

AT HORSE SHOE CREEK.
The most important occurrences of coal in the state, so far discovered and developed, are at Horse Shoe Creek, a tributary of the Teton river, in Fremont county, about 25 miles east of Sugar City, and the same distance from St. Anthony and Rexburg.

Looking east from Sugar City, the peaks of the grand Teton are observed, excepting their highest crests, by a long line of low hills, which in elevation to about 1200 feet above the general level of the Snake river plains, and form a horn shape from the Teton range. They separate the main Snake river valley from the Teton basin and die out in a low escarpment to the north between Canyon Creek and Haden on the stage line extending from St. Anthony to Victor and Jackson Hole. The "big hole" ridge is an artificial fold that is broken at its north exposure in the direction of the South Fork canyon, but its northerly termination seems to be less disturbed and to have a rather uniform structure. A cross section of this uplift from west to east shows a series of alternating layers of lava sheets that cover the entire easterly slope of the ridge and extend nearly to its crest that aggregate 500 feet in thickness, as exposed by a fault in the Snake river canyon near Haden hot springs.

A PECULIAR FORMATION.
Underlying this immense flow of lava and forming the actual crest of the ridge is a series of heavy beds of quartzite sandstone and massive beds of blue and gray cratonic limestone of a very pure quality. Underlying the heavy beds of limestone is a geological width far nearly a mile, a series of beds of cratonic sandstone and shale beds, with numerous intervening seams high grade bituminous coal and overlying this series on the extreme easterly slope of the ridge is a prominent of the same shale that is exposed on the western slope, which is probably the eastern limb of the anticline, and indicates that



Photo by Johnson.
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The coal series was originally entirely capped with this immense rhyolite flow, and has since been covered along the crest of the uplift in a north and south direction, exposing the full width of the coal bearing series. This anticline has been accompanied by north and south fault lines that have broken the coal bearing formations into immense blocks that range from half a mile to a mile in width, and tilt the series from their original horizontal position to a steep pitch varying from 10 to 50 degrees.

PRINCIPAL LOCATIONS.
The principal coal locations of this field are the Horse Shoe, the Brown Bear, the Boise and the Park Saddle, each of which embraces 540 acres and represents an association of qualified coal holders.

The ground is held by possession and has been developed in several instances to a point of preference right, when the land is surveyed. It is still in this locality unsurveyed government land, and cannot be entered and patented until the proper plat is filed in the government land office at Blackfoot. An application for the survey of this land has been made to the surveyor general and will probably be acted upon soon.

There has been disclosed on these four properties by more or less extensive preliminary development, 13 different seams of coal of workable size that varied from two feet to 20 feet in width, and are apparently continuous for nearly four miles in length. These seams strike north 40 degrees west and dip to the southwest at angles varying from 40 to 50 degrees from the horizontal.

THE DEVELOPMENT.
The development consists of shallow

ing an important part in relieving the serious fuel famine situation that exists in that region at this time, and the profits of this operation are religiously put back into new development of this company, and a new cross-cut tunnel is now being run to tap the vein to a depth of 500 feet. Here a much harder and blockier quality of coal can reasonably be anticipated from the action of the vein at the level now worked, which rapidly softens as the coal is worked toward the surface, and produces considerable slack which is a dead loss to the operators under present conditions.

This coal is of the same quality as the analysis given above for the Horse Shoe vein, at comparatively shallow depth of being enclosed in very hard quartzite sandstone walls. It is worked with chutes and handled entirely by gravity without any shoveling, and in such a solid formation affords a very cheap method of mining. The vein is practically free from bone and the only waste occurring in the vein is about two inches of some black carbonaceous clay.

The vein is practically worked on the long wall method with short butt pillars left to protect the entry.

THE COAL ON THE MARKET.
The coal gives excellent satisfaction on the local market. In fact it is desired and commands a premium of \$1 a ton over coal shipped in from other points to the railroad towns. It is sold at the mine principally to the farmers of the thickly settled surrounding country at \$2.25 per ton for round, \$2.00 for run of mine, and \$1 per ton for slack, and a great deal of the fuel is carried to St. Anthony where it commands \$11 per ton, which is \$1 a ton better than the eastern coal now being imported to supply that market, as it gives much better satisfaction than the imported article.

Joining the Brown Bear company to the north, the property of the Boise Coal company carries the same series of veins. In fact it has one clean coal blossom vein in shale fully 100 feet thick, which, however, has not been developed below the blossom stage. Another vein four feet wide in hard sandstone walls has recently been cut on this claim to a depth of 100 feet with a cross cut tunnel that is entirely free from waste or bone streaks, and contains an interesting development of fossil rosin in its structure and joint parts.

NEEDS OF MARKET URGENT.
Adjoining the Boise claim to the north, the Pack Saddle company has recently commenced the development of a nine foot vein of clean coal, and has commenced to put a very good article of fuel on the market. Its property covers the same series of seams, fully half a dozen of which have already been spotted by surface development. Its main opening consists of a tunnel 180 feet long from which an incline is now being sunk to the vein for the purpose of gaining depth more rapidly and making coal available for the present urgent market.

ENORMOUS RESOURCE.
These coals are free burning high grade bituminous quality that give a long, free, oily flame, and are especially adapted for locomotive steam use, and consequently for every other purpose of a high grade bituminous coal. It is apparent from the number of seams that have been disclosed, that the series carries an aggregate width of fully 40 ft. of this clean high grade fuel, which means that a resource of fully 10,000,000 tons of this rich fuel exist on these four properties within the comparatively shallow depth of 500 ft. below the surface in the several veins all of which can be made valuable by cross-cut drainage tunnels without the intervention of hoisting and pumping, and the pitch of the veins guarantees a cheap and economical method of extraction.

On the adjoining Brown Bear property to the north, the most important development of the field has been done. At this point the Brown Bear Coal company has tapped a vein five feet thick at a depth of 100 feet and has driven an entry on it at that horizon 800 feet. From this mine several thousand tons of coal have been extracted and sold to the local settlers, and the mine is play-



LOADING BINS, BROWN BEAR COAL CO.

hardly any likelihood of their proving a serious detriment to the deposits or to the future of the industry. And there is no geological reason why these seams may not continue to be productive on their dip to an indefinite depth and provide a resource of high grade fuel for the people of Idaho independent of its neighbors for its essential necessity of human existence.

EXPERTS' OPINION.
These properties have been examined by a number of expert practical coal mine operators who have passed conflicting opinions on the future of the field. People used to flat vein mining are afraid of the dip of the veins and consider it too steep. Men of broader experience, including the steep pitching veins of Pennsylvania, and other important fields whose deposits range from flat to vertical have a high opinion of this Teton field.

Mr. T. W. C. Whyte, head fuel man of the Anaconda Copper Co., and one of the best practical coal mine valuers in the west, after a cursory examination of these properties, including a dozen average samples from the different veins, informed the writer that he had never met with as many veins of such size in the west that were cleaner and carried such uniform low ash moisture and sulphur contents, and he fully anticipated the development of an important basin of excellent steaming coal at this point.

Similar favorable impressions were obtained after an examination of these properties by Gomer Thomas, ex-state coal mine inspector of Utah, whose experience extends from England to the west coast of the United States, and whose well known ability to judge such matters needs no comment from me. Mr. G. C. Cateau, chief engineer of the Bunker Hill and Sullivan Mining company, and a geologist of international experience in coal, made a critical buyer's report on these properties and highly recommended their purchase and development.

In addition to their virtue as coal

several years ago to sink for oil, as numerous oil seams can be found along the horse shoe valley, from the crest of the valley to the other. This well was equipped with a 75-foot derrick, and had 90 feet of 14-inch casing and 200 feet of 8-inch casing. It was cut down to a depth of 550 feet, but was abandoned four years ago without definite results.

EXTENSIVE DEVELOPMENT.
This fall the Teton Valley Coal company obtained leases on a very extensive area of these valley lands, undertook to put this well deeper and investigate the reported discovery of a 12-foot vein of coal which was supposed to have been cut at 650 feet deep. The well has been sunk to a point 75 feet deep and careful sampling tests along its walls to 250 feet sections have been made, and the results have been very disappointing. The drill, however, has passed into what appears to be the coal bearing series of the state, and there is strong hope of encountering an important coal vein that may be conformable to the broad flat valley surface, as the Idaho Fuel company's well exposed in Horse Shoe Creek, near the edge of the valley, a short distance above Hedges' ranch, occur at a horizon not to exceed 200 feet below the east leg of the rhyolite anticline, and the stratified dip at this point, as compared with a steeper dip of the veins higher up Horse shoe creek, is an indication that the coal series may pass under the broad valley in a nearly horizontal position or as a low incline.

IMPORTANT WORK.
The extensive development of this coal field would prove of more importance to Idaho citizens and business life generally than would any other mineral resources of the state, as fuel is absolutely essential to the successful development of many other important resources of the state, and the geographical position of these properties, together with the quality of the coal, gives them an advantage that goes without comparison.

The properties described are unfortunately in the hands of people of limited means and their development has been much slower than the showings have warranted.

The great agricultural resources of the Snake River valley are capable of supporting a population of a million people. When properly handled, the Snake river will irrigate 2,000,000 acres of land and 2,000,000 acres are now under process of being reclaimed by a numerous large irrigation enterprise of our state, but there is nothing that will stimulate the progress of this great work of the material development and home building more than the development of a cheap and easy available resource of fuel.

IDAHO FOR HERSELF.

The citizens of Idaho all over the state, as far east in the direction of the source of supply as Pocatello, are now paying from \$3 to \$12 per ton for Wyoming Illinois coal, and are glad to get it at these figures, and judging from current reports of the advance of 25 per cent per ton for Rock Springs coal at the mine, the prospect of the coal industry in Idaho is bright. The coal industry in Idaho is a reduced source rather remote, and Idaho's prominent citizens are warranted in taking much more active interest in the development of their own proven resource in the mining coal.

The metal output of Idaho for 1907 will fall short of last year fully 15 per cent, due to the same causes that have affected other states. Our big lead-silver deposit in the north, in respect to development and have made very large output this year, until recently when the output has been restricted by the inability of the smelters to receive the ore.

The mining industry as a whole all over the state has enjoyed a very prosperous year, and our year's dividend record will aggregate fully \$5,500,000.

New development is in progress at numerous points in the mining counties, and I look for a continued and steady increase in our metal production.

BLACKFOOT AND VICINITY RAPIDLY FLOURISHING AHEAD.

BLACKFOOT is the county seat of Blaine county, Idaho, and is ideally located in the eastern portion of the Gem state, in the great Snake River valley. It is on the main line of the Oregon Short Line railroad and besides is on the Salmon river branch, which extends westward to central Idaho. Blackfoot is 26 miles north of Pocatello, 158 miles north of Boise, and 196 miles from Salt Lake City. The population is nearly 3,500, and each month adds to the general tone.

EXCELLENT SCHOOLS.

Blackfoot supports excellent graded schools, furnishing employment for many teachers, and it is the proud boast of residents that no county in the state in proportion to population maintains better pupils.

Some better idea of the enterprising spirit of Blackfoot residents can be had when it is mentioned that a dozen different secret and fraternal lodges are represented.

The business of the town is carried on in substantial buildings. Blackfoot is supplied with telephone, electric lights, electric power, a water system with plenty of fire pressure, a modern volunteer fire department, an electric and company, a National bank, a large flouring mill, a state hospital, the Southern term who for a United States land office, a best sugar factory and many other institutions of major importance.

SPLENDID ROADS.

Aids from transportation by means of railroad, Blackfoot has in addition to the main line of the Oregon Short Line and the usual telephone and telegraph lines, Blackfoot is the central station through which the main line of the Oregon Short Line, for Idaho, Oregon and Montana, and the telephone company has erected a large brick building for this exchange.

Blackfoot is situated in a great expanse of agricultural lands which are partly settled and cultivated; many small farms are being constructed for irrigation, tapping the Snake river and carrying the water out upon vast plains which constitute the blackfoot valley of the Snake.

ranging from \$50 to \$100 an acre, while unimproved land may be had for much less, and at prices that insure the investment to be profitable.

GRAINS AND GRASSES.

Every kind of grass grows in the middle states will grow in and about Blackfoot. Alfalfa, the most nutritious of forage plants, resembling clover, flourishes, and forms one of the staple products. It makes two or three crops each year, and what is not used by the farmer commands ready sale to stockmen, who range their herds in the mountains in summer, and winter them among the farms near the sugar factory, where they use the best pulp in connection with hay and grain.

Cereals, fruits and vegetables attain the highest degree of excellence, and grain averaging 60 bushels per acre, weighing heavier than in almost any other state is the rule. Whole fields of oats have been raised that weighed 45 pounds per bushel.

MARKET INCREASES.

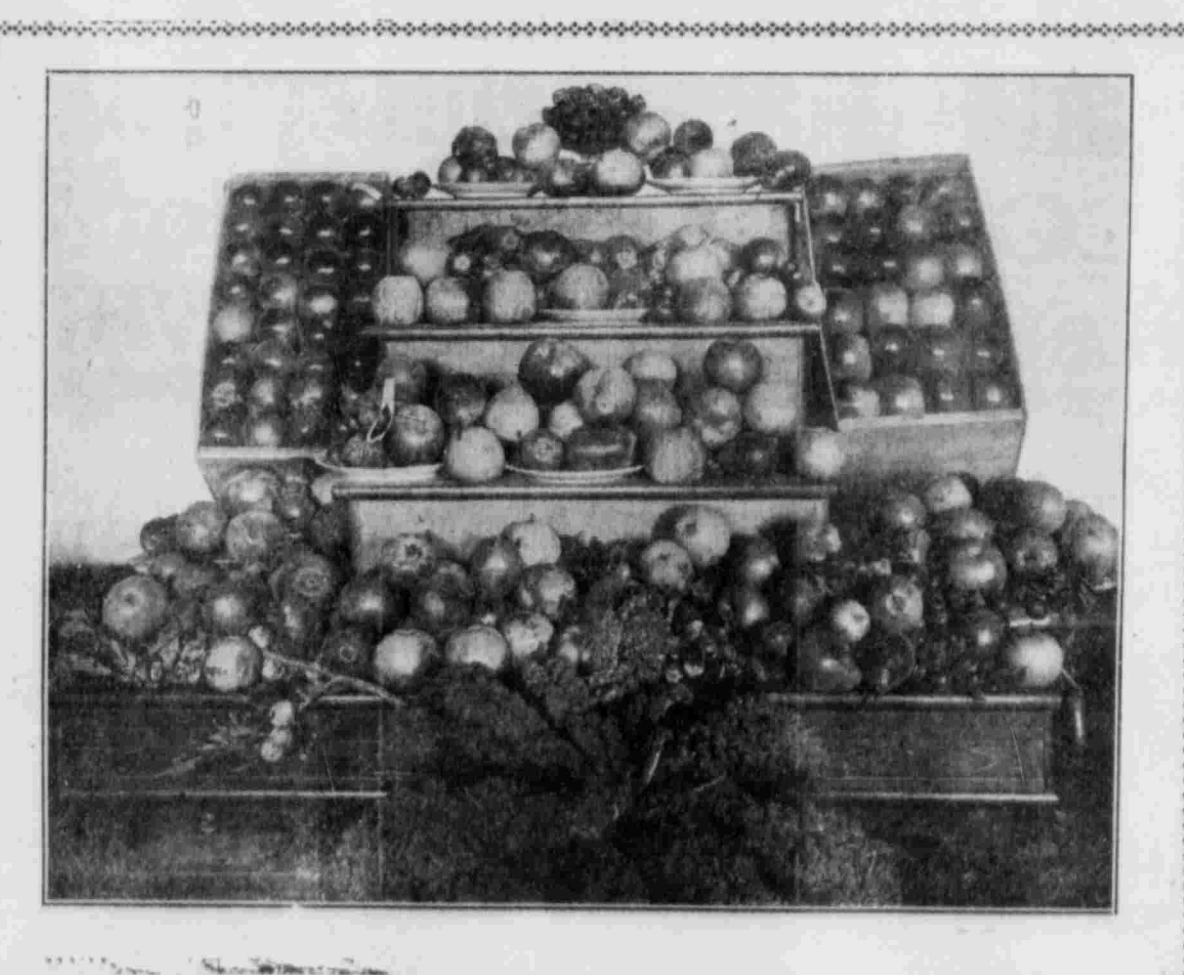
The great mining and lumbering sections of the state constitute a rapidly increasing market for the products of the farm in every form, and gives the farmer the opportunity to compete with distant localities in production.

The altitude of the valley is about 4,500 feet, and the climate is milder than in corresponding latitudes in the central states because it is modified by the prevailing winds from the southwest. The winters are not severe.

REVOLUTIONIZING FARMING.

The establishment of the numerous sugar factories in the Snake river valley inaugurated an industry which is revolutionizing the entire farming industry and giving greater wealth to agricultural classes in and about Blackfoot.

At National Bank of Blackfoot was established October 19, 1904, the local capitalists interested in it giving to Blackfoot and vicinity the only national bank it can boast of up to date. These gentlemen were E. M. Kennedy, E. A. Doherty, D. P. Pratt, L. Blawie, C. M. Bumgarner and E. H. Caple.



SAMPLE OF SPLENDID FRUIT R ISED IN AND ABOUT BLACKFOOT.

In Blackfoot can lay claim to as large a percent of its stock being held by local capital.

A large amount of credit for the success of this institution is due to the service of D. V. Archbold, the efficient assistant cashier, who has been with the bank for the past two years. He is at all times polite, gentlemanly and careful in caring for the wants of their customers combining the qualities of business and sociability in one.

One of the largest mills. The Blackfoot Mill and Elevator company, limited, with a capital stock of \$25,000, operates one of the largest mills in the state of Idaho. The daily capacity is 200 barrels with a storage capacity of 5,000 bushels. The company was incorporated in 1902 and its business extends to the Oregon line on one side and east to and into Wyoming.

When Mr. Smith arrived in Blackfoot he was the only man who had any faith in that section as a fruit growing country. Now the demand upon his and other nurseries is far greater than the supply. Mr. Smith's tree sales amount to \$10,000 annually. The nursery is located just two miles from Blackfoot, proper off the Mackay branch.

Mr. Smith desires to form a co-operative nursery and produce company to carry on a general nursery business together with handling produce, apple boxes and berry crates.

Another feature of the company would be to plant orchards and acquire all lands possible. Farmers throughout the valley are interested in the plan to incorporate a company at \$10,000. Mr. Smith putting in his property at a valuation of \$20,000.

WATER POWER OF IDAHO.

ALTHOUGH, considering the density of its population, southern Idaho is making a magnificent showing as a manufacturing state, the time is at hand when better results and greater achievements will crown the brow of Idaho manufacturers. Among all the Rocky Mountain states Idaho is the best watered and consequently the best equipped for natural power. It is no exaggeration to say that this state abounds in power sites. There are the great falls at Shoshone, the famous Twin Falls, the powerful American Falls, a few miles up the river from Boise is the immense dam being constructed by the government, there is the dam at Milner and so we could go on endlessly, each of these named being capable of producing horse power up into the hundreds of thousands. Consider for a moment the great manufacturing industries which almost in a night sprang up at Niagara Falls and then compare the strength of even the great river to the power generated by the streams of Idaho. Some of this has already been harnessed, a plant has been established at Shoshone Falls, taking some small share of the power which that stream produces. The American Falls and the Idaho falls have been partially harnessed. Boise and many other cities are now lighted by water power, the Boise and Inter-urban electric road and the mill of the Harber Lumber company with its annual pay roll of \$200,000 are operated by the same means.

BLACKFOOT NURSERY.

One of the important institutions of Blackfoot is the great nursery of that name established in 1897 by Mr. O. F. Smith. This flourishing tree-man reached Idaho Falls in 1893, purchased a position as free salesman and the following year found him in Blackfoot. He started in accumulating land and began the planting of orchards. From this humble beginning he built up a business which today amounts to \$20,000 from an invested standpoint.

her which is being carefully tended and preserved. If it can be well viewed the forest reserve in the same light as does the government, namely as a lumber farm, a place on which to grow trees for the market, you will see what a great source of wealth it holds. In the not very distant day when the Pacific coast states shall have been denuded of their lumber, as was Michigan, Wisconsin, Illinois and other states, Idaho's 20,000 acres of timber will stand forth in the United States like an oasis in the desert of Sahara.

Already these forests are pouring their products into the market. In the last year several logging firms have been working in the forests and have found that an excellent profit can be made in the lumber business by the new method. While these logging companies are cutting the matured trees, the forestry department are planting new ones and caring for the young forest, making a permanent and lasting source of wealth not equaled in these United States of America.

The Rat Campaign.

Before winter sets in every farmer should inaugurate a vigorous rat campaign and keep at it until every one of the pests is annihilated. If such a thing is possible. A recent government bulletin on the subject points out the urgency of a campaign against the rodent pests when it states that they annually destroy \$100,000,000 worth of agricultural products and merchandise. Among the poisons recommended is barium carbonate or barites, which is without taste or smell and in small quantities which would be used for rats, is harmless to the larger farm animals. The action of the poison is slow, giving the rats time to leave the buildings in which the poison is placed. It may be given in the form of a 20-cent made of one-half barites to four-fifths flour, or the poison may be mixed with eight times its bulk of common oatmeal and made into a stiff dough or it may be spread on bread and butter or unsalted toast. The poisoned food should be placed in the roadway in small quantities and the dose repeated if the first dose does not seem to do the business. Of the devices which are used in securing the rodents the galliotins have been found to be most effective and satisfactory. This may be baited with a piece of bacon, cheese or kernels of corn.

Why?

A young lady who taught a Sunday school class of young boys was asked by one of the inquisitive questions sometimes propounded by her young pupils.