

IS MUCH BAUXITE ORE IN ARKANSAS

State Produces 92 Per Cent
of Yearly Output of
United States.

MODEL TOWN MAINTAINED

Corporation Has Done a Great Deal
for Employes at Its Saline
County Plant.

By Fletcher Chenault.

(Staff correspondent of the Gazette.)
Bauxite, April 27.—There is an agreeable way to pass the time if you feel old age creeping on, after you discover the merits of a rocking chair and your whiskers get tangled in your suspenders, if you wear either or both. You can loll in the shade on the front porch, with a pipe in your mouth and meditate upon the vanities and the chimeras of this world and possibilities of the next. You will not be annoyed if some one in the house says: "Go take grandpa his fan and tell him to put on his shoes."
When you reach that advanced age, no doubt, and here's hoping that you do, you will wonder if the races that crawl through the centuries, praying to their strange gods, always fighting and struggling, always striving to excel in art and literature, always vanishing and giving place to new races, ever will make full use of the riches of the air and soil placed here by an omnipotent Creator for their advantage. For centuries strange people have scampered over these hills, intent on their small affairs, and never knowing what treasure-houses of wealth lay under their feet, it is only recently that the white race, the most masterful of all, began to utilize the timber and water power, began to reclaim the coal, oil and gas for its own purposes; and a century from now, we are told, the soil of Arkansas will yield even greater riches than we know about now.

Arkansas Rich in Bauxite.

It was not known, for example, that Arkansas is rich in bauxite ore until the discovery was made by the late Dr. John C. Branner in 1891; and it was not until 25 years ago that the product was mined. Last year Arkansas produced 296,320 long tons of the total of 316,540 long tons produced in the United States, or approximately 92 per cent. Bauxite first was discovered in the United States in 1857 near Rome, Ga., and it exists elsewhere in the United States only in Georgia, Mississippi, Alabama and Tennessee. Bauxite is the ore from which metallic aluminum and aluminum chemicals, such as alum are made. The name is derived from district of Les Baux, France, where the ore first was discovered. It is mined in Arkansas by the American Bauxite Company, Superior Chemical Company, Globe Bauxite Company, Southern Bauxite Company, The Republic Mining and Manufacturing Co., but the mammoth plant of American Bauxite Company at Bauxite is one of the largest in the world. This company owns or leases about 11,000 acres, on which are deposits of ore in varying quantities.

The town of Bauxite is owned and operated by the company. L. R. Brantling, superintendent, and it ranks with Crossett, which is owned by the Crossett Lumber Company, and with Wilson, which is owned by R. E. L. Wilson, as one of the model towns of Arkansas. In all three of these towns are model schools, churches and com-

munity buildings, parks, playgrounds and malaria control. It would seem that big corporations often will do more for a community than the community will do for itself if left to its own resources.

Shipped to Other States.

Arkansas bauxite is far removed from the manufacturing centers and most people believe this is due to the lack of hydroelectric power in great quantities. It is a fact, however, that to produce a ton of aluminum five tons of bauxite and 27 tons of other material, such as limestone, coal, salt and sodium carbonate, are required. The freight on this other material, if brought into Arkansas, would be exorbitant; cheaper to ship the ore to East St. Louis, the assembling point, from which the alumina, a fine white powder, is shipped to Niagara Falls, and other manufacturing points where large quantities of low priced electric power are available.

Outcrop ores practically are exhausted. Most of the bauxite now is brought to the surface on inclined tracks to a narrow gauge railroad. It is transported to the central milling plant to be crushed, dried in rotary kilns, and loaded into special closed bauxite cars for shipment. The industry supports from 5,000 to 6,000 people. Including the freight, it distributes between \$3,500,000 and \$4,000,000 annually in Arkansas. A tidy sum.

When an effort was made recently to overtax this industry, John T. Fuller, who was superintendent of the American Bauxite Company, compiled figures which prove that the distance of Arkansas bauxite from the manufacturing centers, and the consequent long haul, makes it a poor competitor with foreign bauxite. Shipment of ore from South America by an all-water route has endangered the Arkansas production.

State High in Production.

But there is a vast supply here—92 per cent of the annual production in the United States to be exact—enough to bring nearly \$4,000,000 annually into the state; and there does not seem to be much strategy in plotting to kill a goose that lays a golden egg.

Limestone, coal and salt are found in Arkansas and hydroelectric power is being developed. Why not some day let's have our own reduction plants on the spot and make our own alumina?

It would be difficult to get the people of Bauxite to believe that a corporation that brings so much capital into the state and expends so much money in fostering the health and education of the community, could be a menace. What the Bauxite housewives say when the wind is from the east and dust from the big mill lows over the town, is another story.

Cement Made of Bauxite Attracts Attention of Concrete Engineers

EDWIN C. ECKEL, in Manufacturers Record.

Portland cement has now been in use as our leading artificial structural material for almost exactly one hundred years, and for many purposes it is likely to continue in use for many decades longer. But for certain special uses, and among these certain very important uses, it now seems likely to be replaced by one of the newer types of cement, made specially to satisfy special requirements. The new cements here referred to are the Alumina Cements, a term which I have applied in order to avoid using specific brand names, and which seems likely now to be adopted officially when the new cement is placed on the American market for next spring.

The alumina cements are strictly "new" only in the sense that they are novelties to the American engineer; they have as a matter of fact been made and used for some fifteen years in France and elsewhere in Europe; and they have established a certain definite success along certain definite lines. Their replacement of Portland cement for such special uses is not based on competition in price,

for the alumina cements are dearer than Portland; but on superiority in quality for the particular uses to which they are put.

Alumina cements have two valuable technical properties. They are, first of all, particularly resistant to chemical attack, and have been used successfully in sea-water and in grounds soaked with alkaline waters, where ordinary Portland cements had failed. Their second important technical property is the quickness with which they attain their total strength; a concrete made with alumina cement will give in a day or two, tensile and compressive tests equal to those given by a Portland concrete a month old. All of these facts have been thoroughly established during some 15 years experience in Europe and they are not stated as arguments but merely as summaries of current engineering knowledge of the alumina cements.

As to technical details, the alumina cements differ markedly from Portland cement in their raw materials and in their manufacture. So far as the first point is concerned, they use

limestone and bauxite as raw materials—a point which is of particular interest to the South, where all of our known bauxite deposits are located. So far as manufacture is concerned, the alumina cements are commonly though not necessarily made by complete fusion in a furnace, rather than by clinking in a rotary kiln, as are the Portlands. The reason for this difference in procedure is economic rather than technologic; with a mix high in alumina and low in lime it is easier to fuse completely than to semi-fuse or clinker; and if one intends to fuse a mix, the furnace is far cheaper than the rotary.

It is probable that the first heavy output of Alumina Cement in this country will be made this winter and next spring in one of the northern states, because of market conditions. But so far as cheapness of manufacture is concerned, localities where limestone, bauxite and coke can be assembled most cheaply will ultimately have the preference for coldly commercial reasons. It is therefore reasonable to assume that within a few years the South will have a far larger proportion of this new industry than it has of the existing Portland cement industry.

The limitations on the cement as suggested above, will arise if at all, not from technical considerations but from high cost of raw materials. At present the cheapest source of such materials are the lower grade bauxites, for which no such materials has hitherto been available; but it is by no means certain that this dependence on a bauxite supply will continue for many years longer. Investigations now in progress on a very large scale—also, it may be noted, in a Southern state—suggest that we may be on the verge of securing a far cheaper source of alumina than bauxite, not only for the Alumina Cement industry but for other purposes.

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**Scenes at Dixie Bauxite Mine Near Little Rock,
 Only One of its Kind, and Operations Foreman**



—Gazette Staff Photo.
 Photographs taken underground in the Dixie Bauxite company mine at Sweet Home show unique methods of extraction for this ore, which is ordinarily mined in an open quarry or gravel pit. John Olson, 60 years old, shown at the top, left, has more than 45 years of mining behind him, with never an accident, and is just as content to work at 60 feet as he is at 6,000. He came to this country from Norway as a boy of 15 and went to work in the Michigan fields. He was brought here to supervise the timbering of the Dixie levels, and to serve as day foreman. At his right are a group of workers, including his son, Wilfred, crew boss and general assistant. They are loading a car with ore just blasted from the tunnel's end, from which the picture was taken. Note the heavy timber work, which eventually will support a tremendous load of earth caved in from above. The negroes must shove the car on narrow-gauge rails to the shaft, but they are happy; a certain number of cars to load and they are through for the day. The lower picture shows drillers attacking the "far frontier" of the mine level with compressed air drills. This hole has been cooped into pure bauxite ore, and the timber work has not yet caught up with the drill, which is boring holes for dynamite charges. The two Olsons stand at the right. Note the lamps set in the miners' caps.

**Mine Near Little Rock Is
 Only One of Kind in World**
Gazette 5/26/28
**Bauxite Is Removed from Surface of Earth Through
 Series of Tunnels Many Feet in Depth—
 Big Factory Planned at Site.**

A labyrinth of pitch-dark tunnels, ankle-deep in water; the occasional flare of a carbide lamp, approaching or receding in the gloom; at regular intervals the boom of a descending mine bucket, the concussion of a dynamite blast, or the creaking of an ore-truck handpushed over narrow-gauge rails—that is the setting for what some might imagine a prosaic sort of business out on the Little Rock-Pine Bluff highway.

Bauxite ore is gray, uninteresting stuff. Who would think of sinking a 60-foot shaft and scrambling about underground for it? Alum is the epitome of dryness and tongue-puckering astringency: Who would associate it with the dankness and mustiness of a mine? Why should the trappings of an iron mine or a coal mine go with the extraction of a substance which looks so much like ordinary clay?

Only Mine of Its Kind.

Whatever the reasons, R. B. ("Bob") Oliver and D. B. Hill, who control the Dixie Bauxite Company, have a real, old-fashioned mine on what was once the Hoekstra farm across from the Confederate Soldiers' Home at Sweet Home, and believe it or not, it is the only one of its kind in the world. Arkansas

bauxite authorities say as much, and they can speak for the entire industry. Men have been digging like ants under the Hoekstra place since January, carving out the fingers of a gigantic, hollow glove which have groped now almost to the edge of the highway. But they have left no ant hill—not much of one, at any rate. They are working in a solid bed of ore, and whatever they ship up the shaft is too valuable to be left lying around.

Bauxite ore is generally uncovered by the simple process of stripping off whatever earth or rock happens to be above it. Sometimes after the excavation has been completed to the bottom rim of the ore bed, the miners bore straight into the uncovered ore, and criss-cross it with tunnels and sublevels under what is known as the "drift" or "incline" process.

The Dixie mine covers too small an area for this type of drilling, which requires a long upslope in proportion to the depth of the excavation. Moreover, a 20-foot stratum of lignite overlies the bauxite, and lignite isn't the easiest substance in the world to remove even with steam shovels. The shaft method has been found much more economical for the Dixie mine, and it happens also to be considerably

more picturesque.

Picturesqueness is all right, too, but the Dixie Bauxite Company isn't stopping there. It's payrolls that we need—Little Rock needs—Arkansas needs, "Bob" Oliver thought. And he thought that the way to get them was to stop sending out raw material to be manufactured elsewhere and reimported.

\$75,000 Factory Planned.

Oscar Olson, company chemist and right-hand man for the powers that be, is now engaged on plans for a \$75,000 alum or aluminum sulphate factory which will produce 50 times daily of the material now used in filtration plants all over the world. Low grade bauxite from the Dixie and Dixon mines will be used. The latter is located between Sweet Home and the Arch street "cut off," and has been abandoned temporarily, though it was here that Oliver, Olson and P. A. Dullin, Missouri Pacific freight agent at Sweet Home, launched their original scheme for exploiting the bauxite deposits in this section two years ago.

A \$30,000 calciner plant will be erected early in 1929 to dry out the ore more intensively. An 80-foot rotary kiln, twice the size of the kiln in the present drying plant, will be installed; crushers will pulverize the raw ore; and storage sheds will be provided. Baking out the water which gives cohesion to bauxite clay will mean a saving in freight charges of about 20 per cent, it is estimated, and enable the company to charge more per carload, based on the additional processing.

Both plants will be located on the Hoekstra lease. In time the lease site will be pitted with holes, because the surface eventually will cave in upon the hungry tunnels below. There are 200,000 tons of ore still to be taken out before that happens, according to Oliver, and he thinks he has 15 years to operate before the last level of the

ore beds worked.

The Dixie mine has other tricks. In most bauxite workings the air is filled with the fine, pulverized dust from the drying kilns. By means of an exhaust fan and a settling device the free dust from the Dixie furnace is drawn into a storage chamber, preserved and sold for enough to pay for the fuel. In addition, it fetches a premium of two per cent from one buyer because of its particular fineness.

Dynamite is used to gouge through the bauxite bed, and a system of delayed timing is employed to give additional force to the blasts. Parallel rows of holes drilled in the frontier wall are filled with explosive, which is detonated at about five-second intervals, so that the inner charges go off first. The outer charges then tear viciously at the ready-made central hole.

50 Men Work on Job.

Fifty men are working in day and night shifts, getting out two carloads of ore in the daytime and one at night. They are directed by experts from the Michigan mining area—Olson, who worked underground as a lad before he began studying the chemical end; his father, John Olson, a mining veteran of 50 years, who saw that the tunnels were properly timbered; his brother, Wilfred, and Larson, the night foreman.

Negro laborers compose most of the remaining force, and though they are plain cotton field darkies, they remain satisfied with their work and their hours because of the contract basis of their employment. The number of cars they load, not a fixed number of hours, determines the length of the day's labor for them. Most of them are able to quit in midafternoon.

There are all grades of bauxite in the Dixie property. Some of it is so poor that it has been left beside the hoist derrick, awaiting conversion into alum. Some of it is very good chemical ore, low in iron. Most of the iron is magnetic and can be removed with magnets. A good deal of the iron-tainted ore is marketable readily. Some buyers want one combination, some another.

All these grades are tested by Oscar Olson in the frame, gas-filled laboratory in which he works, upon Pine Bluff highway. He knew just what spot to sink the main shaft, because the principal mine buildings are clustered about it on the surface, and it was not desired to wreck them in the final cave-in of the honeycombed mass. Instead a plug of low grade ore was found through which the shaft was run.

Olson also knew the direction in which to send his tunnels, this for one grade of ore, this for another. The network now forms, as a result, a rude horseshoe, with the ends pointed toward the highway.

Finally, and most important, he knows how each carload of ore shipped from the plant tests. Not a carload has been rejected of the 2,000 disposed of in his regime.

Miner All His Life.

Olson laid out the Dixie mine and Olson is on the ground, running it now. The son of an immigrant Norwegian, born in the Michigan mine fields, he dug coal and iron ore as a young lad in Michigan, Minnesota, Tennessee and Virginia. Later he went to the Missouri School of Mines and studied the chemistry of mining. He came to Arkansas as chemist for the du Pont interests, which developed the long-abandoned Rauch mine, out on the Arch street pike. Later he worked for the Dixon brothers, and when they ceased operation he interested Oliver and Dullin in his proposition for more practical extraction of the ore. Now he draws a royalty on every ton shipped.

When the test drillers, struggling through the lignite beds on the Hoekstra farm, disgustedly asked to be relieved, expressing the profound conviction that there was no bauxite under them, Olson firmly requested that they stick to their contract and pierce the coal stratum. Bauxite is not always found near lignite, but in many cases lignite is found near bauxite. The chance was worth taking, as circumstances have well proved.

Reporters Penetrate Mine.

Two Gazette reporters, one carrying a camera, penetrated the mine the other day. From the surface it looked very dull, shoddy and uninteresting, with a conventional engine operating a conventional hoist, a conventional bucket shooting periodically into the air and emptying automatically into trucks, the trucks moving ore to an endless chain conveyor, the ore passing wet into the drying kiln and emerging on a wide belt 10 minutes later, as dry dust and pellets.

The reporters put on boots and coveralls and started down the shaft, and it ceased to be conventional. Slippery, narrow rungs, everything dark, no sound but the slush of water somewhere below. Six or seven flights, and that was ended, but it seemed like 70. Then the bottom of the shaft and the "old metal bucket," lying ready for a load, and starting with surprising suddenness when it got it. A well-lighted stretch, an empty mine car manned by negroes, slopping around in the water.

Heavy logs support this vital section of the mine. Many of them run from 18 inches to two feet in diameter. Smaller timbers form an interlacement overhead. John Olson, an impressive figure in his miner's suit, with the blaze from his lamp striking out from his cap, says that such timbering is necessary. It is not done so in the coal and copper mines, he explained, but those mines do not use the cave-in method. Eventually the timbers and "mats" of boarding overhead will bear a tremendous load. At

the very last, when all the ore has been taken out, they will be blasted away and the earth and lignite will settle down into what is left of the Dixie mine.

Safest Method of Mining.

Up a perpendicular ladder to one of the "sub-levels," one of the upper chambers that has just been started. There is hardly room to turn around, but the level will be extended to full length shortly. The ore is dropped down into the tunnel below. When there is no more at hand, another "sub-level" will be started, above it. It will be cleaned out in the same way. Then the floor will be caved in upon the first level, and the floor of that will be caved in on the ground level. Business of a collapsing shell. But the Olsons say it is the safest method of mining known.

Down the main tunnel again to the far end, almost beneath the Pine Bluff highway. Only a few feet left to go here. A negro driving a rotary drill, operated by compressed air. The holes he makes will be filled with dynamite. The miners will mark time during and after the blast, until the smoke has cleared away. Compressed air helps to drive it out. Then they will fall to with shovels, and load their cars. The dynamite crew alternates with the loading crew at either end of the horseshoe-shaped tunnel. They are loading at the other end now.

The air is filled with a fruity odor, like pineapples. They say it is from the miners' lamps. No danger from an open flame in this mine. No working under heavy air pressure, either. Olson Sr. inquires if the reporters have ever been down 6,000 feet, as he has. They deny this vehemently. He leaves the impression that it isn't so good.

A few photographs, a good deal of talk, then up again. The camera rides the bucket, something the men aren't allowed to do. Only they do it, anyhow. The reporters climb the ladder, as usual. It is easier this time. The higher you go, the solder the ground when you get there. Funny thing about Mother Earth. You never appreciate her until you leave her.

Veterans at Business.

If the Olsons are veteran miners, so is "Bob" Oliver. A contractor and road builder practically all of his life, he started mining in the South Carolina kaolin beds 32 years ago. Kaolin is another derivative of aluminum, white as chalk. He mined in the days when the upper crust of earth was stripped down with pick and shovel perhaps 30 to 50 feet deep before the ore was reached. Dump carts hauled off the cars, and steam shovels were a novelty that people came hundreds of miles to see.

The Dixie site is leased from Mrs. T. Hoekstra, who receives a royalty on each ton. There are about 40 acres in the tract. Originally it was a hill, but the Missouri Pacific railroad sliced 30 feet of gravel off the top of it and furnished a sunken level for the miners to work on. The bed of ore is 40 feet deep at its maximum, trailing off to about eight feet at the ends. The mine shaft was sunk at the apex of the hill. Counting the vanished gravel stratum, the shaft now reaches 90 feet below the original surface. It will not be drilled any deeper, because that's all the ore there is, as one might say.

Oliver has a theory that his mine used to be a swamp. When the shaft was sunk, a petrified hollow cedar was found 34 feet below the original hill-top. Inside was a petrified bit of gum. And below was the lignite bed, which everybody knows was formed by decaying vegetation under great pressure. When the drillers finished they knew it had been a swamp. Water poured into the shaft and flooded the outfit for days. It finally was pumped out, and is now collected in a 15-foot underground "sump" from which it is pushed to the surface.

Nobody agrees as to just what bauxite ore contains, but chemists say the valuable part is a mixture of alumina molecules compounded with varying percentages of water. Anyhow, the Dixie bauxite averages about 58 to 61 per cent of it. There is two to five per cent silica, two to five per cent iron, and about three per cent of titanium. The rest is moisture and other substances which pass off as vapor in the drying kiln.

**MUCH BAUXITE IS
MINED IN COUNTY
ARK. GAZETTE**
Hastily Formed Company
Finds Ready Market for
Product.
June 23 - 1927.

Fear on the part of a Missouri Pacific railroad station agent at Sweet Home that his station would be closed unless sufficient business developed to make it profitable to keep an agent there has been responsible for the building up of an industry, backed solely by Pulaski county men, that now looms big in possibilities.

The industry is not new to Pulaski county, for it is bauxite mining, but as the local company has developed it, the industry is reaching out to farmers in the vicinity of Sweet Home whose properties otherwise would not be worked for many years, and plans for erection of an aluminum sulphate manufacturing plant at Sweet Home within the next two years are being made. The company has shipped several thousand tons of ore this year and, beginning July 1, will be shipping at the rate of 5,000 tons a month.

The station agent who brought about the development of the new bauxite properties is P. A. Dullin, 2222 Vance street, Little Rock. He now is secretary and treasurer of the company which is mining bauxite and his income from the venture, to say nothing of future prospects, makes his salary as station agent appear infinitesimal, but he is still station agent just the same.

Industry Not New.

The actual beginning of bauxite mining dates back several years, to a time when the American Bauxite Company, which operates probably the largest mine in the world at Bauxite, and the Republic Company, then a competitor of the American Company, began prospecting around Sweet Home for the mineral. The Republic got an option on a deposit on the farm of J. P. Wright, about two miles southwest of Sweet Home on the Belt line, or Dixon, road which links the Sweet Home and Arch Street pikes.

Before the Republic had operated the property, and before the five-year option expired, the Republic was absorbed by the American Bauxite Company, and the latter company, after removing about 12,000 tons of ore, as provided in the Republic's contract with Mr. Wright, decided not to continue operations there.

The American Company then was mining bauxite about a mile north of Sweet Home on property owned by the Ratcliffe estate—a property which is situated alongside the Missouri Pacific railroad where the ore could be loaded with practically no haul. This property still is producing from 2,000 to 3,500 tons of ore a month and it was said yesterday, can be operated for many years more without exhausting the deposit.

Out to Build Up Business.

In 1925 the ticket sales and freight business at the railroad station had fallen to almost nothing as a result of the increased number of passenger automobiles and the transportation of freight to and from Little Rock by truck. This loss of business threatened to bring about the closing of the station.

Mr. Dullin had been agent at Sweet Home for many years. He had lived in Little Rock all that time and when the business was at this low ebb he was in Little Rock High School and wanted very much to continue until she was graduated.

To forestall closing the station and his consequent transfer to some other city or town, Mr. Dullin began casting about for a way to build up the freight business to a point that would justify keeping it open. He got Mr. Wright's consent to allow him to try to sell some of the ore on the farm.

The first letter offering the ore for sale was written and mailed August 18, 1925, to the General Abrasive Company of Niagara Falls, N. Y. This letter was followed by other correspondence over a period of two months during which several samples of ore were sent to the company for analysis. At the end of two months the Niagara Falls concern ordered a carload of ore on trial and Mr. Dullin and Mr. Wright got it loaded by employing teams and hand shovel labor.

Big Order Filled Quickly.

On November 10 of the same year, or about a month after the first car was shipped, the Abrasive Company telegraphed an order for 20 cars to be shipped by December 1, or within 20 days. After that date, the message said, there was danger of the ore freezing in the cars and being rendered unfit for use in the Abrasive Company's plant.

A company was hastily formed under the name of Dixon Brothers & Co. This concern is composed of A. M., Ed W. and Andrew M. Dixon whose farms are in the immediate neighborhood of that of Mr. Wright, D. B. Hill & Co. a Little Rock contracting firm composed of D. B. Hill and R. B. Oliver, and Mr. Dullin. A. M. Dixon was named president, Mr. Dullin was named secretary and treasurer, and Mr. Hill superintendent of mines. Later Oscar Olsen was employed as chemist and was declared by Mr. Dullin yesterday to be the most important man in the company's organization.

The contracting firm as a part owner in the company immediately shipped steam shovels and other equipment to Sweet Home and began getting out ore to fill the 20-acre order. The cars were loaded and shipped ahead of time, and the Niagara Falls company immediately ordered another 10 cars for delivery before December 10. This order also was filled on time.

To New Location.
The following year, which was 1926, the company removed the rest of the high grade ore from Mr. Wright's farm and moved across the property line on to the Dixon property, where it now is working. The General Abrasive Company was supplied with all its bauxite ore last year and will be supplied with all it needs this year. During the last winter, box cars were lined with tar paper and loaded with layers of asphalt two feet thick between which were strips of tar paper. The cars were shipped when the weather was freezing in the North, but the shipments were delivered to the abrasive plant unhurt by the low temperatures.

Thus far the company has mined on the Wright and Dixon farms approximately 40,000 tons of ore. For this ore the property owners were paid a straight \$1 per ton royalty. The company received from \$6 to \$8.50 a ton, according to grade, and from this paid the state severance tax and cost of mining and hauling to the railroad.

On the Dixon property, according to Mr. Dullin, there is sufficient high grade ore to keep the mining machinery busy for another 12 months, and large quantities of lower grade ore which they expect to sell for use at water plants for purifying purposes, or for other uses. To accomplish this machinery for treating the ore will be installed in a plant at Sweet Home.

Other Deposits Found.
With the end of the high grade ore in sight on the Dixon property the company began some time ago to prospect for other deposits. On the farm

of Mrs. T. Hoekstra, just north of Sweet Home, investigators found a deposit covering five acres with a stratum of bauxite ranging from 18 to 32 feet through. The officers contracted with Mrs. Hoekstra for this bauxite and stripping already has begun on the property.

This deposit, Mr. Dullin said, lies under and overburden of 49 feet which must be removed before the ore is reached. The first 25 or 30 feet of this is gravel and clay. Next there is a 20-foot stratum of lignite, and then the ore. It has not been determined whether the lignite is sufficiently high grade to be of commercial value but this also is being investigated and may mean another source of revenue.

Plant Ready Soon.

Materials now are being collected for construction of a crusher and dryer on the Hoekstra farm, and by the time the overburden is removed and actual mining of bauxite is started there, this plant will be ready for operation, Mr. Dullin said. The company also contemplates installation on this property of a calcine plant which will dry the ore further, and within the next two years expects to have in operation a plant for the manufacture of aluminum sulphate.

Orders already are on hand for all the ore the company can mine this year, Mr. Dullin said, and prospective purchasers of ore, after the additional machinery is installed, include the Calumet Baking Powder Company, the Superior Chemical Company of Joliet, Ill., several water purification plants, and the big oil companies. One of the largest purchasers of the company's ore at present is the Gulf Refining Company at Port Arthur, Tex., which converts the bauxite into aluminum sulphate and aluminum phosphate and uses the chemicals in an oil cracking process.

The ore at Sweet Home is said to be of the highest grade found in Arkansas.

The Dixie Bauxite Company of Little Rock, capitalized at \$40,000, filed articles of incorporation. P. A. Dullin and O. A. Olsen are the principal stockholders.

**BAUXITE COMPANY
PLANS EXPANSION**

Owners of Saline County Properties to Make Many Improvements.

Expansion of its operation in Arkansas is contemplated by the American Bauxite Company, and before the end of this year or early in 1929, a considerable sum will be spent on improvements, a group of Arkansas industrial leaders and financiers were informed at a dinner given by W. C. Ribenack, president of the Little Rock Chamber of Commerce, for officials of the bauxite company and associated companies.

Among the guests were: W. C. Neilson of Philadelphia, president of the American Bauxite Company; E. S. Fickes, vice president of the Aluminum Company of America; B. Barnes, general superintendent in charge of operations of the South American properties; John T. Fuller of Paducah, Ky., president of the Franklin Fluospar Company; L. R. Branting, general superintendent at Bauxite; H. C. Couch, Alfred G. Kahn, F. W. Niemeyer, Julian Blass, W. A. Hicks and Roy L. Thompson.

Mr. Neilson told of plans for increasing the production of bauxite and for improvements at the holdings in Saline county. Some of the processes of extracting the mineral will be changed.

The company now is improving its water supply by piping it from Saline river and filtering it properly, instead of continuing to depend upon deep wells. This change has necessitated a large expenditure.

The visitors are making a tour of inspection of holdings of the American Bauxite Company and its subsidiaries.

**TO OPPOSE REMOVAL
OF BAUXITE TARIFF**

C. of C. Committee Told Proposal Would Be Ruinous to Arkansas.

Preparations were made yesterday by the Executive Committee of the Little Rock Chamber of Commerce to oppose a proposal for removing the tariff from bauxite imported into the United States.

Action was urged in a communication received from J. H. Hand of Yellville, who is a member of the Board of Governors of the American Mining Congress, Southern division. His information came from Henry M. Payne, consulting engineer and general secretary of the Congress, and was that American importers of bauxite were asking for the removal of the tariff.

The situation was characterized by Mr. Hand as "startling and dangerous so far as Arkansas is concerned." It is believed that removal of the tariff would ruin the bauxite industry in Arkansas.

Officials of the Chamber of Commerce will send messages to Arkansas senators and representatives, asking them to work for an increase of the tariff rather than its removal.

The meeting of the Executive Board was the first of a series of weekly sessions that will continue throughout the year. Hereafter they will be held at 2 p. m. each Tuesday.

The committee decided to send two representatives to Washington to work in the interest of a new federal building for Little Rock. Efforts will be made to have an appropriation for the work included in the list for 1929, which will be completed in about two weeks.

Several other matters were referred to the committees and committee appointments of President Fred I. Brown were approved. It was announced that a program of activities taking in the ensuing five years, will be presented to the committee at its next meeting.

**Bauxite Mining in Arkansas Is
One of the State's Big Industries**

Hillsides of Little External Value Have Been Made to Yield Great Wealth, and Many People Derive Income From Capital Invested Here.

Faith, according to Mark 11:15, will move mountains, and what St. Mark said some 2,000 years ago, plus man power, steam shovels and electricity has been proved at Bauxite, Saline county.

Bauxite, be it known, is the source of a considerable part of the world's supply of the ore from which aluminum is obtained.

**REMOVING BAUXITE
TARIFF IS OPPOSED**

Discussion in Conferences Between Congressman Ragon and G. O. P. Leaders.

Conferees with Congressman Heart-sill Ragon relative to protecting the bauxite industry in Arkansas from foreign competition were held in Washington last week by Wallace Townsend, Republican national committeeman, and George L. Mallory, United States marshal and former national committeeman, it was announced yesterday following their return to Little Rock.

A tentative campaign for combating the effort to remove the \$1-a-ton tariff on imported bauxite was agreed upon by the Republican leaders and Mr. Ragon. The congressman, who is a member of the House Ways and Means Committee, which has the matter under consideration, will file a brief with the committee, Mr. Townsend said.

Petition for lifting the duty on bauxite was presented July 10, 1928, by the Kahlfleische Corporation, which practically has exhausted its bauxite deposits in Georgia and wishes to import the ore from Dutch Guiana, where it has other mines.

Removal of the tariff would prove disastrous to the Arkansas operations, Mr. Townsend said, as the cost of production in other countries is approximately \$3 a ton less than in the United States. The difference was attributed to the higher wages commanded by laborers in this country.

**Arkansas Bauxite Production
Increased During 1928.**

(From the Gazette's Correspondent.)
Washington, D. C., May 14.—Arkansas produced 361,236 long tons of bauxite in 1928, valued at \$2,193,230, as compared with 303,830 long tons in 1927 with a value of \$1,892,860. Department of Commerce figures show. The output of bauxite from Georgia, Alabama, and Tennessee, the only other producing fields in the United States, decreased from 17,110 long tons in 1927 to 14,190 in 1928. The Arkansas production overcame this deficit and produced an increase for the United States of 17 per cent in quantity and of 14 per cent in total value as compared with 1927.

**ALUMINA FACTORY
SOON TO OPERATE**

Plant at Picon Will Manufacture Product From Raw Resources of County.

The new sulphate of alumina factory at Picon, which was opened for public inspection yesterday, soon will be operating at full blast, it was announced yesterday by C. W. Linthicum, president of the company. Officials of the operating company are pleased with the outlook here, Mr. Linthicum said.

The new factory has a capacity of producing 450 tons each month, and demands already made far exceed the output, it was said. The International Paper Mills of Louisiana suggested that the company place its bid to supply the paper plants with about 500 tons of sulphate of alumina monthly. Efforts will be made to increase the capacity of the factory to compete with other plants in making bids for large contracts, officials of the company said.

Paper companies and city water plants are the biggest users of alum such as produced here, he said. The plants at Little Rock and Fort Smith, and other Arkansas towns, will be supplied with the product made here because of the attractive freight rate.

Sulphate of alumina is entirely an Arkansas product. All the constituents may be obtained in Pulaski county. The factory here is said to be the first industry of its kind in the state, as bauxite has been shipped to other states for the manufacture of alum. Every stockholder in the company is a resident of Arkansas, Mr. Linthicum said.

The town of Bauxite nestles in the foothills of the Ouachita mountains about 25 miles southwest of Little Rock, and is a thriving little village. The topography of the county immediately surrounding it is not what it used to be, for verily mountains have been taken from where they once were, and new ones have been built. And the process of remaking the face of the earth still is going on.

It requires a long stretch of the imagination to connect bauxite, the ore, with the shining pots, pans, coffee percolators and other utensils that grace the kitchen shelf, or the airplane that soars overhead on strong aluminum alloy wings. Bauxite is about the most drab looking commodity in the world outside of red and yellow clay, or rocks impregnated with iron, and that is exactly what bauxite looks like.

Romance in Its Mining.
However, the mining of this product in Arkansas during the last three decades has been filled with real romance. Hillsides of no apparent value except for the timber growing on their slopes have been made to produce great wealth. Owners of such lands have been able to sell or lease mineral rights at many times the value of the timber. Residents of the section, eking out a precarious living on unproductive soil, have been given work at wages which brought them more money in a month than they were accustomed to see in a year. Arkansas has reaped revenue through a severance tax which has gone into the state school fund and aided children throughout the state.

The town of Bauxite and most of the mining lands surrounding it are owned by or are under lease to the American Bauxite Company, a subsidiary of the Aluminum Company of America. It is the largest bauxite producing company in the world and in addition to owning approximately 6,000 acres, has mineral leases on a similar amount.

L. R. Branting now is superintendent of the company, having succeeded John T. Fuller, former Arkansas state geologist, in 1924. Mr. Fuller had served as superintendent from 1919 to 1924 and preceding him was the late Col. John R. Gibbons, the first superintendent, who was in charge of the properties for 19 years.

600 Men Employed.
The mines now employ 600 men, exclusive of contract labor used in stripping the overburden from the underlying strata of bauxite. Sixteen miles of surface narrow gauge railroad are operated over the properties, and there are eight or nine miles of underground narrow gauge track. The company has an annual production of 300,000 tons of ore, and a monthly payroll of approximately \$46,000. The town of Bauxite has a population varying from 1,500 to 1,800.

The history of bauxite in Arkansas, as a mineral of value, actually dates back to its discovery in 1887 by the late Dr. John C. Branner, then state geologist of Arkansas, the father of George C. Branner, present state geologist. It was not until 1891 that he had investigated his find sufficiently to make a report on it, however, and not until 1900 that production in commercial quantities began. Even then it was on a small scale. During the next 20 years, however, the industry was developed rapidly, reaching its peak during the war days when as many as 2,000 men were employed by the American Bauxite Company.

In the early days, and for more than 20 years in fact, all the mining was from open pits, known as strip mining. A few years ago, however, as strata of bauxite were located at varying levels, some of them 200 feet or more below the surface of the hills, it was determined that underground, or tunnel mining was cheaper than stripping off the heavy overburden. At present both kinds of mining are being used to take out the ore.

During the less than 30 years since the American Bauxite Company began its operations in Saline county, practically every nationality in the civilized world has been represented among its employes, but aside from native Americans, mostly Arkansians, the largest groups have been Italians, Mexicans and negroes.

At one time there were Italian colonies in which English hardly ever was heard and less often understood. There is now a Mexican colony and a barracks building for single Mexican men. In the Italian colony each home had its outdoor oven where huge loaves of bread were baked in quantities sufficient to take care of the family's needs for a week. In the Mexican colony the peppery dishes of the Southern republic is the order of the day and almost any time, one passing either colony at mealtimes found the air redolent with the odor of garlic.

In the strip mines the overburden of dirt and rock is removed by steam shovels where it is sufficiently heavy, and by graders where the bauxite is near the surface. On level spots strings of graders are hitched to caterpillar tractors. Before any stripping is done the timber is cut off and sawed into lumber in the company's mill to be used for new buildings in the town, about the mill, or in timbering the underground works.

Strip Mines Scattered.

Strip mines are scattered for several miles around, some of them worked out and now being filled up with the overburden from new mines. Wherever the ore is hard, and most of it is, it is broken up with dynamite and then loaded into dump cars on the narrow gauge railroad by steam shovels. In some instances, however, the ore is of the consistency of clay.

The strip mines are drained by a scientifically worked-out system of ditches, ending in a main ditch which carries the water from these mines, and the underground workings as well, for three miles to Hurricane Creek.

The underground mine has a main haul line of approximately three miles, extending entirely through a mountain. This line is on level so that heavy trains may be pulled by electric locomotives with a minimum of power. From the main line drifts are run at angles and at levels to conform with the bauxite veins.

Views Snapped by Gazette Photographer Showing Properties of American Bauxite Co., Including Section of Huge Rotary Kilns



Views of the bauxite mining properties of the American Bauxite Company, in Saline county. At the top is shown one end of the big mill where the bauxite, or aluminum ore, is crushed, brought up the grade, dried and loaded in specially constructed cars for shipment to the reduction plant of the Aluminum Company of America, in East St. Louis. Immediately below the mill and at the right, is a flashlight picture taken in one of the underground workings. The walls and ceiling of this tunnel are of bauxite. At the left in the center is Davis Portal, one of the entrances to the underground mines, with a train, drawn by an electric locomotive, just emerging from the tunnel. Below is an interior view of the mill, showing a part of one of the huge rotary kilns in which the powdered ore is dried. There are a dozen of these kilns.

Tunnels are driven back into the mountain until the back of the ore body is reached and then chambers are cut into either side of the tunnel. As the chambers from one tunnel are cut through into another, pillars of bauxite are left to hold up the roof, until most of the bauxite in a given sector is taken out. When this stage is reached miners go back to the rear, or extremities of the working, cut out the pillars and the overhead is allowed to fall in behind them. In this way practically all of the ore may be removed before any caving starts.

As the roof of an underground section caves, the entire surface of the mountain above it settles to a depth equalling the height of the tunnel underneath, and the stumps and few trees left on the surface are tumbled into a desolate looking stretch of roots and rocks.

Stretching across the mountain above the underground workings is a large pipe conveying compressed air, and as new tunnels are opened other pipes are sunk through the mountain, connecting the main air pipe, with the workers below. The air is used to operate drills preparatory to blasting the ore in the chambers or tunnels.

Most of the muckers, or diggers, are negroes, although the pay is attractive enough that many white men seek the positions. The skilled or semi-skilled workers in the underground mine are white men, except for timber men. Negroes, according to officials, have been found to make the best timber men and the work of boarding up the sides and bolting the overhead with heavy timbers is done largely by negroes.

The ore blasted out in the underground is loaded onto dump cars which are rolled down, if the side tunnel slopes downward, to the main haul line. If the slope toward the main line is upward, the cars are hauled up by winches. On the main haul line the cars are assembled into trains and hauled outside by powerful little electric engines, driven from storage batteries. Outside, the cars are picked up by steam locomotives.

The ore from both strip and underground mines is transported to a big mill at Bauxite where it first is crushed and then dried in large rotary kilns to remove the moisture, reduce its weight and thus cut down freight charges.

Ore Varies in Elements.

The ore varies in the elements it contains and inasmuch as ore for aluminum requires certain divisions of the elements, the bauxite from various mines is mixed to keep it uniform as shipped.

For instances, ore for making aluminum must contain at least 58 per cent alumina and not more than seven per cent silica. Generally, it is necessary to mix ores from several workings to get the desired ratios of alumina and silica.

Despite the comparative nearness of the Arkansas bauxite mines to the Aluminum Company of America's reduction plant at East St. Louis, the Arkansas bauxite is in direct competition with mines in South America where cheap labor and low water transportation rates permit delivery at East St. Louis at practically as low costs as that mined in Arkansas.

From the reduction plant at East St. Louis, the somewhat refined product is shipped to plants of the parent company at Niagara Falls, Massena, N. Y.; Alcoa, Tenn.; Badin, N. C., or Shawinaggin Falls, Quebec. A new plant now is nearing completion at Arvida, Quebec.

The town of Bauxite is owned in its entirety by the Aluminum Company of America, and a visitor to the village is led to the conclusion almost immediately that it would be well if a similar corporation owned most of the towns of similar size in the country.

Bauxite has well-stocked stores of various kinds. It has a theater, community hall, churches, grammar and high schools, an up to date hospital well-built homes and neat lawns, graveled streets and more conveniences generally than the average community of its size. Peace is maintained by the company's own police force, headed by Jeff Davis, chief of police. Chief Davis is well known in Arkansas as a peace officer, is one of the outstanding finger print and Bertillon experts of the state, and in addition to the authority vested in him by the company, is a deputy sheriff of Saline county and may invoke his power in this position whenever it is necessary to go outside of the confines of the company's property.

Mineral Rights to Confederate Home Lands to Be Sold.

State Revenue Commissioner David A. Gates announced yesterday that bids for mineral rights on 54 acres of state land occupied by the Confederate Home, three miles southeast of Little Rock, will be received August 7.

Practically the entire tract of 54 acres is underlaid with rich deposits of bauxite, and it is for the right to mine bauxite that the revenue commissioner will receive bids.

Large areas adjoining the Confederate Home property are being worked, the ore being removed both by the strip mining and underground methods. Two companies, the Dixie Bauxite Company and the Republic Bauxite Company, are operating in the area.

Deposits on the state property are so far underground that shaft mining is the only method that could be used without destroying the value of the surface property.

An act of the 1929 legislature authorizes the state revenue commissioner to lease certain mineral rights. It is estimated that the state property contains several hundred thousand dollars' worth of the ore.

ARKANSAS-BAUXITE LANDS TO LEASE.

According to a recent enactment of the state legislature of Arkansas, the State Commissioner of Revenues is authorized to lease state mineral lands. Notice is hereby given that approximately fifty-four (54) acres of state bauxite land located immediately north of Sweet Home, Pulaski county N. 54 acres W 1/2 NE 1/4 Sec. 25 in 12W, will be leased on a long time basis in the near future to the individual or firm prepared to make the most satisfactory lease for the state. Those interested should submit their lease bids not later than August 7, 1929. Address: DAVID A. GATES, commissioner of revenues, State Capitol, Little Rock, Ark.

To Receive Mineral Rights Bids on State Property.

State Revenue Commissioner David A. Gates will receive bids tomorrow on mineral rights to 60 acres of state land occupied by the Confederate Home at Sweet Home. The land is underlaid with rich deposits of bauxite, which can be removed by the shaft mining process without injury to the surface. No bids will be considered which do not pay as much as the usual royalty of \$1 a ton plus severance tax, it was said.

Mineral Lease Bids Received.

Consideration of bids for leasing mineral rights to land occupied by the Confederate Soldiers' Home near Sweet Home was postponed yesterday by State Revenue Commissioner David A. Gates until September 16. Several bids were received yesterday, but all were rejected because of a change in the state's specifications. It is proposed to lease the right to remove bauxite from the land by the shaft mining process which would not interfere with surface conditions.

INCORPORATION MATTERS.

The Kalbfleisch Bauxite Company, Inc., incorporated under the laws of Delaware, but maintaining its principal office at Chattanooga, Tenn., and a branch office at Bauxite, Saline county, filed a certificate of domestication in the office of Secretary of State Jim B. Higgins. The company was incorporated as the Comitiss Corporation, but the name was changed recently. Heretofore, the company has operated chiefly in Georgia and Tennessee, but plans to operate in the Bauxite section. Melvin J. Childress of Bauxite was named as agent for service.

ALUMINUM DEMAND SHOWS AN INCREASE

Many Additional Uses for Metal Discovered Since World War.

Aluminum, of which Arkansas supplies 90 per cent of the American production, now is used in so many ways that the demand has increased 300 per cent since the World war, it was said in a bulletin issued yesterday by the Arkansas State Chamber of Commerce. The figures were obtained from the report of a survey made by the Aluminum Company of America.

The survey disclosed that aluminum now is being used in the manufacture of kitchen utensils, radio sets, automobiles, airplanes, furniture, steam and electric railroad cars, vacuum cleaners, moulds, chemical and oil containers, transmission of electric power and in a variety of building operations.

"Another field of particular promise for aluminum," the report said, "is in replacing tin plate now used in the manufacture of cans for food. The high price of tin and its comparative scarcity ultimately will make the use of aluminum for manufacture of cans practical."

—Gazette Staff Photos.

PRESENT TARIFF ON ALUMINUM SOUGHT

Chambers of Commerce Urge Senators to Work for Its Retention.

4-29-30

The Arkansas State Chamber of Commerce and the Little Rock Chamber of Commerce yesterday sent telegrams to Senators Robinson and Caraway urging them to work for retention of present tariff rates on "pig" aluminum and manufactured products—five cents and nine and one-half cents a pound, respectively—and if unsuccessful in that attempt to obtain, if possible, approval of the four and seven-cent rates proposed by a conference committee of the two houses of Congress.

Dudley V. Haddock, manager of the State Chamber of Commerce, said yesterday that rates lower than those designated by the conference committee would wreck the Arkansas bauxite industry. If the aluminum tariff rates are lowered beyond those figures it will be possible for Germany and other countries to deliver aluminum "pigs" and products in the United States cheaper than American manufacturers, he said.

"We feel that everyone interested in the industrial progress of Arkansas should urge the state's delegation in Congress to protect Arkansas' interests," Mr. Haddock said.

The House of Representatives provided in its tariff bill for retention of present rates on aluminum, but the Senate sought to reduce the rates to two cents on pig aluminum and three and a half cents on manufactured products. The matter then was referred to the conference committee.

ARKANSAS FIRST IN BAUXITE PRODUCTION

351,054 Long Tons in 1929 Keeps State in Lead.

5-1-30

By PAUL C. YATES.

(Special Correspondent of the Gazette.) Washington, D. C., April 30.—Arkansas held its rank during 1929 as the leading American producer of bauxite, according to a Department of Commerce summary made public today.

Figures compiled by the Bureau of Mines of the Department of Commerce show that Arkansas last year produced 351,054 long tons of bauxite, compared to 361,236 tons the preceding year. The total American production for 1929 was 365,777 and for 1928 the total was 375,426 long tons.

The value of bauxite produced in Arkansas last year is set at \$2,181,158, as against \$2,193,230 in 1928. Arkansas mines producing bauxite last year included the Sweet Home, Dixie No. 2 and Hoekstra mines in Pulaski county and the Bauxite and Superior mines in Saline county.

Although the main production was from the Saline county field, production in this field declined five per cent, while Pulaski county production increased eight per cent. The production decline for the state was three per cent.

The Arkansas shipments were used for the most part in the aluminum industry, with the abrasive, chemical and refractory industries absorbing shipments in the order named. The average price for Arkansas bauxite, the Bureau of Mines learned, was \$6.21 per long ton, and for the United States \$6.19. The only states producing bauxite commercially, aside from Arkansas, are Georgia, Alabama and Tennessee. For a number of years Arkansas has produced more than 90 per cent of the American total.

Bauxite Discovered. 5-2-30

Gurdon, May 2.—(Special.)—It is rumored that a bauxite mine has been found at Red Springs, four miles east of Gurdon. Geologists and mineralogists have found there, they think, a bauxite formation cropping out of the ground. It is being planned to drill holes and determine just what the formation is and whether or not it is bauxite, and if so in paying quantities. As soon as leases enough to justify the test has been secured the work will begin. The find was on the land belonging to Oscar Aylor on Bear creek near Red Springs. Democrat

Arkansas Bauxite Company to Develop Holdings.

The Arkansas Bauxite Company, organized recently by a group of Little Rock men to develop bauxite holdings south of Granite mountain, filed articles of incorporation in the secretary of state's office yesterday. The company is capitalized at \$25,000, with Edger G. Hanschke as president and John F. Evans as secretary. The incorporators own a large acreage which is believed to be underlaid with bauxite, and have obtained leases on additional land. The ore crops out at the surface in places, but it will be necessary to make several test drillings to determine the extent of the deposit, Mr. Evans said. The company plans to begin test drillings soon, and if the bauxite beds are found to be sufficiently extensive, mining will be started immediately, it was said.

The East Side Furniture Company of Texarkana filed articles of incorporation yesterday. The company is capitalized at \$10,000. J. G. Bickley and others are incorporators.

June 19, 1930

Opportunities for Alumina Cement Manufacture

By

EDWIN C. ECKEL,
Washington, D. C.

FOR the first time since its invention it is now possible to envisage an intelligent and growing alumina cement industry in the United States, one whose growth and success, that is, will not be hampered by artificial (legal or illegal) restrictions, and will be limited only by the enterprise of those who take it up, and by the appreciation of their customers, the engineers and contractors of America.

The legal or patent situation is now precisely as follows: The Spackman patents of 1912, which described no process but did ostensibly at least cover the product itself, have been extended until June, 1935, under a very special act passed in 1928. The Eckel patents of 1924-5-6 are freed by agreement from any possible subservience to those Spackman patents, so that no one need fear patent litigation if he takes up the manufacture of alumina cement under license in a furnace, with incidental recovery of pig iron, high-silicon iron or even ferro-silicon. The U. S. Bureau of Mines has tested these Eckel processes with entirely successful results; the official report is published in its Serial No. 2869 of April, 1928.

As to the effect of all this on actual American development, we have certain facts to date and certain probabilities for the future. To date, the alumina cement industry, covered by the quasi-monopoly of the Spackman patents in this country and free everywhere else, has developed slowly in America. At present the United States produces and uses about ten per cent of the world output. It produces less than Asia; it uses less than North Africa; it makes about as much as a single foreign company shipped in last year into a single Canadian city. Part of this remarkably bad record for us is high cost and price under the methods heretofore adopted; part is apparently due to other causes which need no discussion here.

In order to make an alumina cement of absolutely high quality and steady grade, and to do this at a cost which will permit its sale at say \$2 to \$3.50 per barrel anywhere in the United States, the process used must be one which can utilize low grade bauxite and produce iron or ferro-silicon as a by-product. To do that requires in turn only two appliances:

A. Furnace capable of developing melting temperatures; therefore any iron or copper blast or smelting furnace, any open-hearth furnace, any electric furnace will do very well. An ordinary

foundry cupola can be rigged up so as to produce good alumina cement; obviously a better appliance with larger output, hearth capacity and draft is more economical. All this means that every blast furnace plant, every steel mill, every copper or other metal-smelting plant or refinery in the United States already has this very essential part of an alumina cement plant, about half of the total investment needed is already in place.

B. Grinding and packing apparatus for the finishing of the cement; just as in making Portland, natural or slag cement. So that every Portland, natural or slag cement mill in the United States already has this other essential part of an alumina cement mill.

It is obviously economic for the new alumina cement industry to be taken up as a side-line by a plant already possessed of half the apparatus needed, instead of being developed entirely *de novo* by people who have to build the whole plant for the new cement. But at this moment no one can say which of the two possible courses the industry will take. It may be taken up and developed by the iron or copper industries, or even by the aluminum industry. Or it may, with a late realization of the cold facts, be taken up by the more intelligent and progressive of existing cement manufacturers. Failing either alternative, it may be developed by entirely new interests, not at present too deeply involved in either the iron or cement industries. *But that it will be developed on a very large scale by one group or another is in this progressive country an absolute certainty.*

For the United States, the cheap raw material supplies are Arkansas and Missouri diaspore bauxite for the Midwest mills; Alabama-Georgia-Tennessee bauxite for the Southeast; imported bauxite for the Northeast and Middle States; alunite residue for the Colorado-Utah region; local or imported ores for the Pacific Coast markets.

I do not know of any important market area in the United States or Canada where a really high-grade alumina cement could not be supplied at a price of from \$3.00 to \$3.50 per barrel. And in saying this I am not assuming that the new industry is engaged in a charitable enterprise; at such prices it will make good profits per barrel. And by offering a cement of special quality at

reasonable price it should be possible to market it in terms of millions of barrels annually in a country such as this, where there is a demand for quality, and money to pay for it.

For it must be recalled that alumina cement is not only the quickest hardening of cements, with all the advantages that implies; it is also very resistant to sea-water attack, which is why the British Navy Department insists on its use, and it has special advantages in very cold waters.

In its development the South should have a very large share indeed. For it will be noted that the bulk of our domestic bauxite supplies occur in the Southern States; that the needed coke or electric power are also in the same states; that they already have iron, copper, steel and cement mills which could be easily and cheaply adapted to a new product; and that they include good market areas and have cheap access to other markets.

GAZETTE—11-14-30
INCORPORATION MATTERS.
The Standard Bauxite and Chemical Company, Inc., a Delaware corporation, with operating headquarters at Benton, filed domestication papers in the secretary of state's office yesterday. Jeff Davis of El Dorado was designated as legal agent.

DESCRIBES BAUXITE INDUSTRY IN STATE

G. McCulloch Warns That Excessive Taxation Will Stop Development.

Gazette 1-11-31

The paper read by G. McCulloch of the Republic Mining and Manufacturing Company at the luncheon of the South Arkansas Chamber of Commerce at Bauxite Friday corrected the report general over the state that Arkansas is producing 92 per cent of the aluminum ore recovered in the United States. This statement was true at one time, he said, but production has declined in the last three or four years until now the state produces only 42 per cent of the ore found in the United States and only 24 per cent of the world's supply.

On the eve of the convening of the General Assembly, and the possibility of an increase in taxation of industries, Mr. McCulloch warned that it is just as important to hold industries here as it is to bring new ones into the state. The statement, approved by L. R. Branting, general superintendent, follows:

"As stated by Mr. Branting, we consider it a privilege to have the South Arkansas Chamber of Commerce as our guests today, for it has made it possible for us not only to meet the people from such a large area who have come together, not for selfish purposes, but for the furthering of development in the entire state, and at the same time it has given us an opportunity to show you a little something of our industry, in which we have much pride.

"I pause here to call your attention to the brief statement on your menu with reference to the Republic Mining and Manufacturing Company, and especially to our statement on the bottom of the sheet for it is, of truth, that during the past 30 years we have not only been mining and shipping bauxite, but we have been fostering good citizenship and helping build Arkansas.

"Every one of you knew more or less of our plant and mines, but having seen the place, even though hurriedly, many questions have been raised, and while it is not possible to answer them all in a few minutes I do want to tell you a little of the history and how the bauxite industry relates itself to the state.

"The bauxite industry of Arkansas dates from 1891, when the late John C. Branner, father of George C. Branner, present state geologist, discovered bauxite in Arkansas at a point not a half a mile from where you are sitting today. A few years later there was considerable activity in the purchase of lands, but very little production was made until about the beginning of this century.

"Actual production did not begin until 1899 when Gen. J. R. Gibbons and his son, Felton, came to Arkansas from the Georgia mines for the Pittsburgh Reduction Company, now the Aluminum Company of America, bought considerable leases and actually shipped some ore. By 1904 a small plant had been built by the Pittsburgh Reduction Company and another by the General Bauxite Company. When we think of the bauxite industry, however, we really date it from 1903 in which year we produced 12,787 tons. There was a steady increase, year by year, and in 1907, 55,498 tons were shipped. The panic of that year shut the plant down and very little tonnage was produced until 1909.

"Starting with that year there was a steady increase in production of the mines with the maximum production in 1918 when 479,492 tons were shipped. At the close of the war, business dropped to a very low point, but in 1920 our own mines produced in Saline county 436,750 tons. With the beginning of 1921 the business depression closed down our mines entirely, but 1922 saw a fair resumption of business and by 1923 the demand was as great as during the war period.

"It was during this period that our boosters were announcing far and wide that Arkansas was producing 92 per cent of the bauxite used in the United States and at that time the statement was nearly true. Unfortunately, however, these figures have to be revised when speaking of the present time for during the past six years we have actually produced only 42 per cent of the bauxite used in the United States and 24 per cent of the world's supply, and for the year 1930 there was a further shrinkage of these percentages. One may well ask, when confronted with these figures, 'how come,' and the explanation is comparatively simple.

"When the bauxite industry was forming and getting under way, the demand for aluminum was small and while it sold for a high price, manufacturing costs were also high and it took some close figuring to show a profit.

"Electricity plays an important part in the manufacture of aluminum, the industry requiring about 300 HP of electrical energy per man as against 2 to 10 HP per man in most other industries. As an example of this, it requires 12 K. W. hours of electricity in the electric furnace to produce one pound of aluminum. This fact alone explains why an aluminum plant in Arkansas is an economic impossibility.

"The aluminum industry had its birth in Pittsburgh in 1888, the necessary electricity being produced by steam power, but as the industry grew it became apparent that a cheaper source of power would have to be employed if the price of the metal was to be lowered, and consequently in 1893 the industry moved to Niagara Falls where the falls were being harnessed to produce electrical energy, the aluminum industry being the first customer of the power company. In the production of aluminum it is necessary to refine the bauxite to pure alumina before reducing it to metal, and this refining is a separate chemical process, calling for an entirely different sort of a plant. The industry first figured on locating this chemical plant either in Arkansas or New York, but figures based on both of these locations appeared high so another location was sought. This chemical process calls for the use of large quantities of coal, limestone and sodium carbonate, and as all of these materials are available, at a low cost, in East St. Louis, Ill., this plant was located there. There was no sentiment at all connected with the decision for the locations of these various plants, cost of production being the deciding factors in each case. Arkansas had a large quantity of bauxite, East St. Louis had the materials used in the chemical process, and Niagara Falls had large quantities of cheap power.

"On this line-up, the bauxite industry of Arkansas progressed along parallel lines with the aluminum industry, as other power projects developed at Massena, N. Y., Shawing Falls and Arvida, in the Province of Quebec in Canada, at Alcoa, Tenn., and Badin, N. C., the Arkansas bauxite industry expanded and additional refining plants were built in East St. Louis.

"In the early part of the present

century, bauxite was known to exist only in France and the United States, but with its increased use a world-wide search was started for it, and this search developed the fact that it occurs in Australia, British Guiana, Dutch Guiana, Germany, Bulgaria, Greece, Hungary, India, Ireland, Italy, Roumania, Spain and Yugoslavia, and mining is now being prosecuted in most of these countries, which naturally reduces the use of Arkansas bauxite to a certain extent. However, the worst blow dealt the Arkansas bauxite industry came from its own people through an act of the Arkansas legislature of 1923 when it passed the severance tax and unsettled the industry by first proposing a tax of \$1 a ton on bauxite, although other commodities were to be taxed 2 1-2 per cent ad valorem. The \$1 proposal never went into effect although the legislature did levy a 25-cent tax, and later on when Governor McRae called a special session of the legislature, bauxite was put in the 2 1-2 per cent class. But the damage had been done—if the legislature could tax the industry 25 cents per ton there was no reason why it could not raise it to \$1 or any other amount, so the industry, through the old urge of self preservation, sought other accessible supplies of bauxite and developed large quantities in Dutch and British Guiana where it now operates extensive mines.

"The bauxite industry still means a lot to Arkansas, although it has shrunk from 493,000 tons in 1923 to 351,000 tons in 1929, and while this shrinkage in domestic production was taking place the domestic consumption increased to 746,589. It is one of the few industries that has gone along during the depression without materially reducing its forces or cutting wages, and it hopes to continue operations in Arkansas for a long time to come.

"One of the greatest functions of the Chamber of Commerce is to bring industry to a community and your chamber has been unusually successful in such undertakings. I submit to you that it is just as important to hold industries which you have as it is to bring new industries to the state.

"During the coming session of legislature every effort is going to be made to find new sources of revenue and to increase revenues where it seems possible to do so without undue harm to industries and persons which may be affected. None of us want to see the state take a backward step and we all know that it takes money to run the state, the same as any other business, but we must take heed lest we make the mistake of placing a burden on industry too heavy for it to bear.

"Resources of this country are so widely distributed that it is an easy matter to quit one section and go to another where the government is more friendly. Money is the most mobile thing in the world. It can be moved from place to place or it may be withdrawn entirely for a period. The case of the bauxite industry is an example of what may happen to a lot of other industries when we get over-zealous in our taxation. Our aim should be to hold what we have and then go out for more industries and be able to show them a state not only with resources, but also a state which is not unfriendly to those who would develop these resources."

SAYS ARTICLE ON BAUXITE ERRONEOUS

John F. Evans Calls Attention to Statement of G. McCulloch.

Gazette 1-17-31

In a letter written to the Gazette yesterday John F. Evans, who lives on Dixon road, Rural Route No. 4, took exception to a statement on bauxite production in Arkansas, credited to G. McCulloch of the Republic Mining and Manufacturing Company in an article that appeared in the Gazette last Sunday.

Mr. Evans quoted the article as saying that a paper read by Mr. McCulloch at a luncheon of the South Arkansas Chamber of Commerce contained the information that during the past three or four years Arkansas had produced only 42 per cent of the aluminum ore found in the United States and only 24 per cent of the world's supply.

Mr. Evans said that data obtained from the United States Bureau of Mines showed that Arkansas produced 303,830 tons, or 93.1 per cent of the United States production in 1927; 361,236 tons, or 96.2 per cent of the United States production in 1928, and 351,054 tons or 94.5 of the United States total in 1929.

Discussing Mr. McCulloch's statement that tax legislation in this state had caused the aluminum industry to go elsewhere for its bauxite and to develop large mines in Dutch and British Guiana, Mr. Evans said:

"Right at this place in the history of the industry there is an omission. He failed to tell the South Arkansas Chamber of Commerce that in running away from the Arkansas legislature his company jumped into a 10 per cent tax in Dutch Guiana, and in British Guiana a tax of 10 cents and an additional 1.5 per cent export tax, and when the ore reaches our ports the United States puts another \$1 tax on the same ton. The tax explanation is not convincing. Mr. McCulloch also failed to tell them that the South American ore must be crushed and washed at the mines to remove impurities before it is fit for commercial use."

Mr. Evans said that France and Hungary produce the bulk of European ore, but that 60 per cent of the aluminum used in Hungary in the first half of 1930 was imported from the United States. He said it was known that bauxite was being produced at lower cost in Arkansas than in South America and that Pulaski and Saline counties were losing several million dollars every year because of the imported ore.

"This is not a brief for the taxation of Arkansas bauxite, but is an effort to correct a representation that our deposits are undeveloped because of a fear of taxes," Mr. Evans said. "The intelligent development of our bauxite might make it unnecessary for this county to call on the Red Cross the next time we have a drought."

SAYS STATEMENT IS MISCONSTRUED

Bauxite Mining Company Personnel Director Answers Mr. Evans.

Gazette 1-18-31

Replying yesterday to a statement of John F. Evans on details of bauxite production, G. McCulloch, director of personnel of the Republic Mining and Manufacturing Company, said that Mr. Evans had misinterpreted figures quoted by him in an address January 9 before the South Arkansas Chamber of Commerce. Mr. Evans criticized Mr. McCulloch's speech on the basis of a report printed in the Gazette.

"The newspaper report showed that the Republic Mining and Manufacturing Company produced 42 per cent of the bauxite consumed in the United States," Mr. McCulloch said. "It should have been supplemented with the statement that Arkansas produces 49 per cent of the United States consumption."

Mr. McCulloch quoted the following figures from reports of the United States Bureau of Mines:

1924—Arkansas production of bauxite, 325,616 tons; total United States production, 347,570 tons; imports, 201,974 tons; total United States consumption, 549,544 tons; percentage of Arkansas production to United States consumption, 59.4.

He quoted corresponding figures for the following five years, showing that Arkansas production made up the following percentages of the total consumption in the United States: 1925, 44.2; 1926, 55.1; 1927, 44.8; 1928, 49.7; 1929, 47.

Discusses Taxation.

"In his statement regarding taxation in British and Dutch Guiana," Mr. McCulloch said, "Mr. Evans neglected to state these taxes are in lieu of all other taxes. There is no property tax or personal tax assessed against mining properties in these countries and the sum total of taxation is considerably less than that assessed in Arkansas through the general property tax, personal tax, severance tax and income tax. Bauxite from either the United States or South America must be crushed and dried before it is ready for the market. In the case of European bauxite it is necessary only to crush.

"South American bauxite after it is washed contains an average of two per cent silica and 60 per cent alumina. Arkansas bauxite contains an average of seven to eight per cent silica and 55 to 57 per cent alumina, and at present the Republic Mining and Manufacturing Company is installing washing machinery at its mines in Arkansas in an effort to improve the grade of its ore so that it will more nearly compete with the ore from South America."

Mr. McCulloch said that the largest user of bauxite in this country recently made the statement that Arkansas bauxite at \$4.50 a ton f. o. b. Arkansas barely competes with ore from Dutch and British Guiana (South America) at \$8.90 a ton f. o. b. New Orleans. This indicates, he said, that South American bauxite is practically twice as good as the American product.

"The statement that 'bauxite can be produced in Pulaski and Saline counties, Arkansas, at a lower cost than in South America' is erroneous," Mr. McCulloch said. "Owing to the high standard of living in the United States and the high wages paid for all classes of labor, the cost of producing Arkansas bauxite is greater than production costs either in South America or Europe. The statements and figures I have given can be verified easily by anyone.

"The statement about the Republic Mining and Manufacturing Company running away from Arkansas is refuted by the fact that we are still very much here and are spending thousands of dollars in order to make possible continued operation of our Arkansas properties in the face of many obstacles."

BAUXITE MINING IN ARKANSAS

Gazette TODAY, 1-24-31

Seven or eight years ago the aluminum industry of the United States looked to Arkansas for nine-tenths of its basic raw material. When we said then, with legitimate pride, that more than 90 per cent of all the bauxite used in this country was mined in our state, the statement was "nearly true," according to G. McCulloch of the Republic Mining and Manufacturing Company, which operates the mines at Bauxite, Ark.

But it is true no longer. Since 1924 Arkansas has produced on an average about 49 per cent of the bauxite used in this country. As far as American bauxite mining is concerned, Arkansas still stands far ahead of other states. Statistics cited by Mr. McCulloch in a paper read at the Benton meeting of the South Arkansas Chamber of Commerce credit Arkansas with about 96 per cent of American bauxite production for many years past. But our last year's production was 351,054 tons, compared with 493,830 tons in 1923. Meanwhile, importations of foreign-mined bauxite had increased from 119,020 tons in 1923 to 380,812 tons in 1929. Putting it another way, American consumption of bauxite increased 15.34 per cent during the six years. But Arkansas production fell off 26.97 per cent, and importations increased 220 per cent.

For this rapid gain in importations,

at the expense of one of our chief mineral industries, Mr. McCulloch blames in part an Arkansas severance tax policy that led bauxite users to assure themselves of a supply from other sources. It is also said that some of the foreign bauxites are superior in quality and aluminum content to the Arkansas ore. Whatever the cause or causes of the shift may have been, it is well that our attention should be directed to it, both for our better information as individuals and for the sake of better general understanding if any public action regarding the bauxite industry in Arkansas should come up for consideration.

VAST BAUXITE AREA FOUND IN ARKANSAS

Native Source of Aluminum
Likely to Be Increased
Fourteenfold.

New York Times
MODERN RIVAL TO STEEL

Ultimate Effect of This Production
Base Seen as Changing Industrial Conditions.

5-31-31

By CHARLES MORROW WILSON.

Editorial Correspondence, THE NEW YORK TIMES
FAYETTEVILLE, Ark., May 28.—
A fourteenfold increase in America's active source of aluminum is indicated by a new and authentic survey of Central Arkansas.

Bauxite, which is the ore base for metallic aluminum and several other important minerals, is challenging the supremacy of steel in modern industry and at the present time constitutes the country's most extensive metallic import.

About 95 per cent of all bauxite produced in the United States comes from two concentrated mining areas in Central Arkansas, one in Pulaski County, near Little Rock, the other mining activity is now confined to in Saline County, near Benton. All outcropping deposits in about twelve square miles of rural countryside.

Bauxite responds readily to modern methods in magnetic survey. The recent findings indicate that the two counties hold a fertile production base of at least 165 square miles, which is, so far as mineralogists know, the most extensive bauxite centre in the world—an area with ore resources many times greater than all other known deposits combined.

The ultimate effect of such a production base upon national consumption of aluminum and upon problems of international trade offers a pertinent challenge to industrial economists. Aluminum is fast increasing in commercial importance. It has become an essential in many new and vast industries, including the aviation, automobile, radio, petroleum and utensil industries. Its mining and refining involves many important by-products, which have come to be requisite in the manufacture of abrasives, aluminum chemicals, refractories and aluminum or "quick-set" cement.

By-Products Bulk Large.

Commercial by-products constitute at least 40 per cent of the value of the ore.

Bauxite consumption in the United States has risen from 512,000 tons in 1925 to 746,000 tons in 1930. Of the latter amount 365,000 tons were produced in the United States and 351,000 in the twelve-square-mile area in Arkansas. Prior to the opening of the Arkansas mines better than nine-tenths of the bauxite ore consumed was imported. But the percentage of imported bauxite has decreased from 59.7 per cent of the total used last year.

At the present time the bauxite production is, for practical purposes, a monopoly trade, controlled by the Aluminum Company of America and its subsidiaries, the American Bauxite Company and the Republic Mining and Manufacturing Company, all of which are allied with the Andrew Mellon banking interests of Pittsburgh. But it is easily possible that this monopoly has become established as a result of the supposedly limited base for the commercial mining of bauxite. Now that the theoretic and haphazard boundaries have been lifted, it seems altogether feasible to predict that aluminum's next development may take the form of spirited competition in production.

Although the refining of bauxite is an intricate process, its mining is easy enough, since commercial deposits are within handy reach of the surface, and while averaging about fifteen feet in depth, there are records of holdings seventy feet deep, which would represent a gross ore production of about 140,000 tons to the acre. Land owners have amassed fortunes from mineral royalties of 15 or 25 cents a ton. The market value of the crude ore ranges from \$4 to \$6 a ton.

Electric Power's Importance.

In estimating the probable effects of this unheralded increase in the nation's arena of bauxite, it is interesting to consider the important rôle of new hydroelectric centres upon the expansion of the fast increasing aluminum industry. The necessity for cheap and abundant power for refining bauxite ore is common knowledge. Power requisites are in fact vastly greater than would normally be available from adjoining communities or from neighboring cities. But within handy reach of the nation's aluminum centre we now see in varying stages of construction at least half a dozen major hydroelectric centres, representing a combined investment of at least \$50,000,000. The Rammel, Carpenter and the proposed Blanco Springs dams, holdings of the Arkansas Power and Light Company, propose to develop 300,000 horsepower of electric energy from the Ouchita River. Supplementing these, we observe the rise of four more power bases on White and Buffalo Rivers. Putting two and two together, it seems probable enough that this new arena of backwoods power may play an important part in the country's inevitable struggle for self-sufficiency in aluminum and kindred products.

Bauxite has been found to respond readily to modern methods in magnetic survey. The new survey and re-estimate of bauxite resources was made under the direction of George C. Branner, State Geologist for Arkansas, and Noel H. Stearn, a bauxite mineralogist who worked in cooperation with the United States Geographical Survey. An area of 1,100 square miles was surveyed and magnetic readings were taken at 1,300 stations. Besides evidencing a commercial bauxite area of 165 square miles, the survey indicated an underlying igneous province of some 400 square miles, which may provide a vast secondary base for the versatile mineral.

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Native Source of Aluminum Likely to Be Increased Fourteenfold.

MODERN RIVAL TO STEEL

Ultimate Effect of This Production Base Seen as Changing Industrial Conditions.

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"AN ARKANSAS FAIRY TALE."

Reminding us that in all fairy stories good fortune always favors the good and the beautiful, and applying that to Arkansas, the New York Times says editorially, under the headline we have used: *Democrat - 6-4-31*

"Well, Arkansas is good and—in places—beautiful. She has suffered a long time from the bad fairies which send wicked and thriftless politicians to Little Rock and drouths and floods to the state. Now, because Arkansas is good—in places—beautiful, the good fairies have their inning again. A dispatch in another column from Fayetteville today gives the happy news of the discovery of a 'fourteen-fold increase in America's source of aluminum . . . by a new and authentic survey of central Arkansas.'

"The source is bauxite, invaluable to the aviator and to the housewife. . . . From the pots and pans of the kitchen to the wings of the stately airplane its uses extend. . . .

"People who are always saying that nothing happens any more, who despair of good times ever returning, and are sure that the essential elements of the earth have all been uncovered and are disappearing rapidly, should cheer up after reading the dispatch from Fayetteville. As fish still fill the sea, so wealth still fills the earth. Doomsday is yet some time off."

In all of which we concur heartily, Brother. Not only is Doomsday "a fur piece down the big road," but Arkansas' day is closer than even home folk will admit. The South already is on the upward path to better days and Arkansas is in step with that movement. Such friendly comment as the Times' editor has offered will help a lot to get us back where we belong.

AN ARKANSAS FAIRY TALE.

In the stories which used to be told to children before higher criticism of ANDERSEN and the Brothers GRIMM frightened many parents, luck had a great deal to do with happiness. The wolf was just about to push down the door when down fell a tree upon him, breaking his back. The poor woodcutter's family was starving to death when suddenly a pig, which the woodcutter had by chance come upon and rescued from a trap years before, appeared in his true form as the Prince and scattered gold all over the place. Good fairies vied with bad fairies in these stories in the eternal strife between Ormuzd and Ahriman. But fortune always played a tremendous part, though it is fair to note that fortune invariably favored the good and the beautiful. *Editorial N.Y. Times*

Well, Arkansas is good and—in places—beautiful. She has suffered a long time from the bad fairies which send wicked and thriftless politicians to Little Rock and drouths and floods to the State. Now, because Arkansas is good and—in places—beautiful, the good fairies have their innings again. A dispatch in another column from Fayetteville today gives the happy news of the

discovery of "a fourteen-fold increase in America's source of aluminum . . . by a new and authentic survey of Central Arkansas." The source is bauxite, invaluable to the aviator and to the housewife, chief ingredient of Secretary MELLON'S aluminum product. From the pots and pans of the kitchen to the wings of the stately airplane its uses extend. We have been importing a great quantity of it at tariff rates which have caused charges to fly between the Democratic and Republican parties. Bauxite is easily mined, after tracing by the magnetic method. If the Arkansas discovery proves up to its indications, there will be benefits for many people and particularly for the State itself. After its knee-deep crop of sagging bond issues and its visitations by angry Nature, it seems the poetic justice of heaven to increase the quantity of bauxite fourteen times.

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First Geomagnetic Survey Completed

By TOM SHIRAS.

A recent geomagnetic survey of the bauxite region in Saline and Pulaski counties, by Dr. Noel Stearn, in conjunction with the Arkansas Geological Survey, has apparently increased the potential bauxite-bearing area in the district from 3.2 square miles to 165 square miles. Conclusions drawn from this survey are that many new bauxite mines will be opened up in the area in years to come, and that Arkansas will continue for a long period to supply the major portion of the domestic tonnage of bauxite, that valuable ore from which aluminum is derived.

The geomagnetic survey was the first of its kind ever made in Arkansas. The instrument used was a superdip magnetometer, which traced the course of the formations associated with bauxite, without having to penetrate the earth's crust and prowl around hither and yon with a pick, shovel and dynamite.

From the beginning of civilization men always had a strong urge to see beneath the crust of Old Mother Earth and locate valuable bodies of mineral before they started to dig, to take a straight road via the pick and shovel route, after they had located their treasure without a change of cars. In the breast of every prospector there has always burned the hope that some time or other he would stumble onto some kind of an instrument or method that would tell him where the hidden ore bodies lay. For that reason various kinds of mineral rods have been invented and manufactured to sell to the most gullible of the profession. Millions of dollars have been invested in them, but somehow or other they never seemed to work at the right places.

Use Peach Switch.

Besides the mineral rods, the V shaped peach switch has been a popular instrument for many decades past to use in locating ore bodies and under-

ground water. Try the switch yourself; maybe it will work for you, but don't bet any real money on it if it does.

Cut the switch off the tree just below a fork and trim both ends even, making it V shaped. Take one end in each hand, gripping them tightly, holding the hands up with the bottom of the V up, and start to walk around where you would like to find a fortune in minerals or locate an artesian well. If it works for you, you will suddenly feel a pull on your hands, and the top of the V will start to bend toward the earth. The action is said to be so strong with some people that if the ends of the switch are gripped tightly enough the bark will actually peel off.

The peach switch method has been very successful in locating water. The reason for this is probably that there is water under ground everywhere if one digs deep enough. No one ever made much of a success in locating valuable bodies of mineral with the switch, probably for the reason that they are few and far between. Geologists say that the switch turn downward, not from any attraction beneath the crust of the earth, but from muscular and nervous reaction on the part of the person holding it.

Science Extends Vision.

Because mineral rods and other methods of locating mineral deposits that have no scientific value, were unreliable, the old mining terms, "you can't see beyond the point of your pick," and "one man can see as deep in the ground as another," have held good for centuries.

Science is slow but sure. Every day it proves some things and disapproves others. Day in and day out, year in and year out, knowledge is gained scientifically and placed in the archives of civilization for the benefit of mankind. Present methods are abandoned, old sayings and maxims become obsolete.

One man can now see under the ground farther than another if he is provided with the right kind of an instrument. That is the reason why approximately 162 square miles have apparently been added to the producing bauxite-bearing region of Arkansas.

The bauxite district of Arkansas as it is now known is divided into two mining districts. The Bauxite district, which lies adjacent to the town of Bauxite, in Saline county, and the Fourche mountain district, which is immediately south of Little Rock, in Pulaski county. These two districts are separated by approximately 12 miles of hitherto unproductive territory. The survey indicates the possibility of ore bodies in this territory.

Buxite ore in the district lies on top and in the depressions of the granite. The ore itself is the decayed, upper crust of the granite which has undergone the necessary chemical changes to transform it into ore.

The magnetic method of exploration for minerals, such as was used in making the survey in the bauxite area is based on the fact that the earth acts as if it contained at its center, a spherical magnet surrounded by a magnetic field of force. If this magnetic field were contained in a single homogeneous substance it would be perfectly symmetrical. But the outer shell of the earth lies within this magnetic field, and the earth's crust is composed of rock formations which differ in mineral content and therefore in magnetic permeability—that is, some rocks will permit the passage of mag-

netic force much easier than others. These lines of magnetic force crowd through rocks of high magnetic permeability and avoid rocks of low magnetic permeability.

Measures Magnetic Speed.

The clays and other formations which overlie the granite on which the bauxite lies, and the bauxite itself are of low magnetic permeability. In other words the magnetic force passes through them slowly. On the other hand, the granite, on which the bauxite lays, contains magnetite, which is magnetic, and for that reason the magnetic lines of force crowd through it readily and are easily recorded. In locating the granite with which the bauxite is associated, it was assumed that ore would be found with it more or less over the entire area covered by the survey.

The underlying scientific principal in the survey was that lines of magnetic force pass through some rocks faster than others, just as water passes through a coarse screen faster than it does a fine one.

Besides the superdip magnetometer which was used to record the variations in the intensity of the earth's magnetic field, several reams of paper were used to figure out these variations. This figuring was such too, that it did not fall within the realms of the three R's.

But notwithstanding these new inventions which science has given to the mining industry, the old time prospector will still locate his ore by finding a favorable outcrop and following it via the pick and shovel route or by a hunch. If he is gullible he will of course use a mineral rod or a peach switch. He wouldn't know how to make the readings on a magnetometer, much less figure out the variations.

STATE'S BAUXITE NOT TO BE SOLD

Revenue Commissioner to Acquiesce in Opinion of Legislature.

David A. Gates, commissioner of revenues, yesterday said that no bids for mining bauxite have been received and that if any are received, the bidders will be advised that the bauxite is not for sale.

Mr. Gates advertised for bids to be received today, for mining bauxite on the land at Sweet Home belonging to the Arkansas Confederate Home. He had been advised, he said, that bauxite was included among the minerals on state land he was ordered by act of the legislature to sell. A resolution was adopted at the special session of the legislature which set forth that the legislative act was not intended to include bauxite, and Mr. Gates said he would be governed accordingly.

Governor Disapproves Measure Opposing Bauxite Sale.

Senate Resolution No. 10 by Senator Hendricks of Little Rock, expressing the sense of the Senate that the state commissioner of revenues was not authorized to sell bauxite on state lands under terms of Act 212 of 1929, relating to the sale and lease of mineral rights on state lands, was filed in the secretary of state's office yesterday with a proclamation of disapproval by the governor.

The proclamation said the subject was not within the purpose of the call for the special session and that the resolution should not have been considered.

After its adoption by the Senate, Revenue Commissioner David A. Gates issued a statement, explaining provisions of the act in question and saying he had had no intention of leasing bauxite on the property of the Confederate Home without approval of the attorney general and the state geologist. He announced that plans to lease the mineral rights to the land would be abandoned.

The Dixie Aluminate Corporation of Little Rock, capitalized at \$10,000; articles of incorporation authorizing the company to engage in the manufacture of chemical products; incorporators, O. A. Olsen, P. A. Dulin and Bennie Lee Cross. *12-11-31*

OFFER MADE FOR STATE'S BAUXITE

Commissioner Gates to Submit Sale Contract Opposed by Legislature.

12-15-31

An offer from the Pulaski Mining Company to lease mineral rights to 54 acres of state-owned land on the Confederate Home properties near Sweet Home has been received by Revenue Commissioner David A. Gates.

The company, a subsidiary of the Dixie Mining Company, now operating extensive bauxite mines in that section, proposed to lease the property on the basis of \$1.05 a ton royalty for green ore.

Mr. Gates said the offer is being considered and that a contract is being prepared which will be submitted to the governor and the attorney general for approval before it is submitted to the company.

Engineers have estimated that the Confederate Home property is underlain by several hundred thousand tons of bauxite ore.

The special session of the legislature last October adopted a resolution expressing belief that an act passed several years ago to authorize the revenue commissioner to lease certain mineral rights to state lands did not apply to bauxite deposits. Governor Parnell declined to approve the resolution on the ground that it dealt with a matter not included in the call for the special session. Advertisements for bids on mineral rights to the Confederate Home property were withdrawn after adoption of the resolution.

Mr. Gates said that if a contract is entered into with the Pulaski Mining Company, royalties from the lease will be held in the state treasury subject to disposition by the 1933 General Assembly.

Company Bidding for State's Bauxite Incorporates.

The Pulaski Mining Company of Little Rock, a corporation formed to mine bauxite at the Confederate Home, if the state accepts its proposal to lease the mineral rights to the property, filed articles of incorporation in the secretary of state's office yesterday. W. S. Farrell, Edgar S. Dixon and L. E. Farrell of Little Rock are the incorporators. The company's capital consists of 300 shares of common stock without par value. The incorporators have subscribed for \$1,000 worth of the stock. State Revenue Commissioner David A. Gates is considering a proposal submitted by the company to remove bauxite from the 54 acres occupied by the Confederate Home, on the basis of \$1.05 a ton royalty for green ore.

NEW FIRM WILL UTILIZE BAUXITE

Dixie Aluminate Corporation to Open New Plant Next Month.

Dec 19, 1931

Bauxite will be the principal raw product utilized by the Dixie Aluminate Corporation, which is completing a modern chemical plant at 1100 Fairview street, near the Rock Island tracks, P. A. Dulin, an officer of the firm, said yesterday.

The company, organized recently, has as its other officers O. A. Olsen and Miss Bennie Lee Cross. They also are officers of the Dixie Bauxite Company, which for the past seven years has produced bauxite ore in the vicinity of Sweet Home.

Associated with them in the new enterprise is C. R. Ragsdale, formerly with the Southwest Chemical Company. The Aluminate Corporation will engage in the business of treating water for city waterworks, ice plants, railroads, steam plants and other industries. Mr. Dulin said that a complete laboratory for analytical and research work is being installed in the new two-story building. He expects the company's operations to be nation-wide.

41 Men Work at Mines. The bauxite used by the Aluminate Corporation will be taken from the mines of the Dixie Bauxite Company, which employs an average of 41 men daily and which has not laid off a man or reduced wages this year, Mr. Dulin said. In peak years, the average number of employes was 65.

"The mill consists of one small dryer and one small calciner," Mr. Dulin said. "For chemical or alum ore, the dryer is used to remove 10 per cent of the free water."

Mr. Dulin said that while the Dixie company is "strictly an independent concern," it has not been discriminated against by the large producers of bauxite. He said that "the big fellows are interested chiefly in the metal game and we are too small for them to pay any attention to us."

He said that there will "always be plenty of bauxite of the grade required for the Dixie Aluminate Corporation at the mines near Sweet Home." The new firm is expected to open for business early in January.

The lease provided for immediate payment of \$500, which will be paid into the state geologist fund, and for an advance flat royalty payment of \$10,000 January 16 each year. This payment will be credited against payments on the following royalty basis:

Terms of Lease.

For each long ton of green ore, \$1.05; for long ton of dried ore, \$1.17; and for each long ton of calcined ore, \$1.80.

In event the price of the three grades of ore exceed \$6.50, \$7.25, or \$12 a long ton, respectively, the company agreed to increase the royalties proportionately.

Attorney General Involved on Both Sides in Bauxite Dispute.

Gazette 1-7-32

Mr. Norwood Sole Contributor, So Far, to Fund for Litigation Launched by U. D. C. Against Contract Signed by Him.

Whether the lease contracted by the state with a bauxite mining company for mineral rights on the property of the Arkansas Confederate Home at Sweet Home is invalidated or upheld in the courts, Attorney General Hal L. Norwood to a certain extent is going to be on the winning side and the losing side, too.

For, in his official capacity, Mr. Norwood approved the lease on behalf of the state. On the other hand, Mr. Norwood has contributed \$20 to the costs of instituting the suit to break the lease, and thus far has been the only contributor to a U. D. C. fund to be used in fighting the lease, representatives of the organization said yesterday.

Several weeks ago, the Pulaski Mining Company obtained a lease from the state of Arkansas on grounds included within the boundaries of the Confederate Home, where a large quantity of high grade ore is said to exist. U. D. C. and other Southern patriotic organizations opposed the principle of the lease, and maintained that blasting and other mining operations on the grounds would prove not only disagreeable but dangerous to Civil War veterans and to widows of veterans, who live at the institution.

So the members of the committee from the U. D. C. called on Mr. Norwood, and asked him how they might best proceed to void the mining contract. Mr. Norwood told the committee that he had signed the lease, with other state officials, because it was correct and proper in all legal aspects, but that

he emphatically was not in favor of disturbing the old soldiers.

The committee then asked Mr. Norwood what could be done to stop the mining, committee members said. Mr. Norwood was said to have advised them to see Governor Parnell, and, if he could do nothing, to institute legal proceedings to break the contract. He offered to contribute to a fund for costs of filing the suit. The committee members took both advice and offer.

Several days later another U. D. C. committee of about 40 women called on Governor Parnell, and, upon finding that the chief executive could not help them, returned to Mr. Norwood's office.

"We've come for that money you offered us, Mr. Norwood," they said.

Whereupon Mr. Norwood, after some discussion, placed a \$5 bill on the desk, saying very little. And what is \$5 to 41 women?

First Proffer Spurned. "We don't want that, sir. We're not begging, and you made the offer without any solicitation."

Mr. Norwood reached for his pocket-book accordingly. But \$20 is a lot of money in any man's life today.

"I'll lend you \$20," he countered. "\$20 for one year."

"We'll pay you interest," he was told. "I don't want interest," said Mr. Norwood graciously, placing the money on his desk.

The women hesitated, but not for long. They took the \$20, left, engaged their attorneys, and the suit has been filed.

LEASE FOR STATE BAUXITE APPROVED

Pulaski Mining Company to Extract Ore on Confederate Home Property.

1-7-32

A 10-year lease for bauxite mining rights on 54 acres of state land on the Confederate Home property, three miles southeast of Little Rock, was executed yesterday by State Revenue Commissioner David A. Gates, in favor of the Pulaski Mining Company, an Arkansas corporation formed recently to mine bauxite in Pulaski county.

The lease was approved by Governor Parnell, Attorney General Hal L. Norwood and G. C. Branner, state geologist. It was executed by Mr. Gates under authority of Act 212 of 1929, authorizing the revenue commissioner to lease mineral rights on state lands.

All mining operations are to be by the underground method and the surface of the Confederate Home grounds will not be molested or disfigured, it was said. The lease provides that no mining or excavating shall be done within 50 feet of any of the principal buildings now used by the Confederate Home.

After production gets under way and has exceeded a tonnage sufficient to offset the advance annual royalty payment of \$10,000 royalties will be paid to the state Revenue Department monthly.

No money, except the \$500 paid upon execution of the lease, will be paid by the company until after the legislature meets in 1933 and that body will appropriate money received from the mining operations to any purpose it may see fit.

Preliminary and unofficial estimates place the amount of ore available for mining at from 200,000 to 500,000 tons.

State Leases Bauxite Land Mining Rights

1-19-32

10-Year Agreement Executed on Confederate Home Properties.

A lease contract whereby the Pulaski Mining Company of Little Rock is given the mineral rights to mine and sell bauxite on 54 acres of state-owned lands on the Confederate Home properties near Sweet Home for a period of 10 years was executed yesterday by David A. Gates, revenue commissioner, on behalf of the state, and approved by Governor Parnell, Attorney General Hal L. Norwood and George C. Branner, state geologist.

Under the terms of the lease, the mining company paid the state \$500 upon its execution and agrees to pay \$10,000 each year during the tenure of the contract as advance royalty for the succeeding year or part of year.

Prices to be paid to the state for the bauxite are \$1.05 for each long ton (2,240 pounds), of merchantable green ore, \$1.17 per long ton of dried ore, and \$1.80 per long ton of calcined ore, as shown by railroad bills of lading and scale tickets. The lease provides that in no case shall the royalty be less than the figures quoted, and the Pulaski Mining Company agrees that if the price paid for bauxite f. o. b. cars exceed \$6.50 per ton for green ore, \$7.25 for dried ore and \$12 for calcined ore, royalties on each class of ore shall be increased by such per cent as the increase in price of ore may exceed these amounts, respectively.

The lease stipulates that the lessee company is not bound to produce and sell any amount of bauxite up to December 31, 1933, and failure to remove or produce any bauxite during 1932 and 1933 shall not be considered for a forfeiture or cancellation of the lease by the state as long as advance annual royalties are paid. It is set out in the lease that the mining company will remove 10,000 tons of green bauxite from the lands during the calendar year 1934, and the same amount each year thereafter as a minimum gross annual production, and failure to produce this amount shall work a forfeiture of the lease, unless the lessee shall pay the minimum advance annual royalty set out.

The lease agreement provides that if production of bauxite shall be begun on or before July 1, 1934, the amounts previously paid in advance royalties are to be applied to and deducted from the tonnage royalty, and if on or before July 1, 1933, sufficient tonnage has not been removed from the state lands to produce tonnage royalty which shall have absorbed the sum of all advance annual royalties previously paid, the balance of

the sum of the advance annual royalties shall not there after be applied to or deducted from the tonnage royalty due, but shall be considered as liquidated rents due the state.

Tests on the tract are to be made by drilling in checkerboard manner, not more than 150 feet between holes. The underground system of mining is to be used exclusively and no open pit operations will be permitted, neither will the caving system be employed in removing the bauxite upon any of the premises, leaving sufficient pillars to hold up and sustain all surface.

No bauxite crushing, drying and calcining will be permitted on the lands, and no mining structures are to be erected in certain restricted areas occupied by the administration and hospital buildings and a distance of 50 feet around such buildings, and on U. S. Highway 65.

The lease of the Confederate Home lands was made under authority of Act 212 of 1929, authorizing the commissioner of revenues to grant mineral rights on state-owned tracts, with the approval of the governor, attorney general and state geologist.

These officials stated yesterday they considered the contract an advantageous one to the state and will yield badly needed money to the state. Receipts from the mineral rights leases are credited to the state general revenue fund.

The Pulaski Mining Company is a subsidiary of the Dixie Mining Company, which is now operating extensive bauxite mines in the vicinity of Sweet Home. Incorporators of the company are W. S. Farrell, president; Edgar F. Dixon, secretary, and L. E. Farrell, all of Little Rock.

Engineers have estimated that the Confederate Home property is underlain by several hundred thousand tons of bauxite ore.

Lease of Confederate Home Grounds Called a Disgrace.

1-19-32

To the Editor of the Gazette: David A. Gates, state revenue collector, with the approval of Governor Parnell and Attorney General Norwood, has leased to the Pulaski Bauxite Company, the right to mine for bauxite on the 54 acres owned by the state and which was bought and deeded to the Board of Trustees of the Arkansas Confederate Home for the use and benefit of the Confederate veterans, their wives and widows.

They have paid into the geologist fund the first \$500 for the lease. Why not pay the money to the pension fund where it rightfully belongs if they must sell the bauxite? Selling the bauxite and permitting the mining of same at this time is a shame and a disgrace to the Confederacy. The bauxite is not going to get away, neither is it going to get any cheaper, nor is there any big demand for it or the American Bauxite Company would be running its mines at full blast, instead of letting them be idle. I know the contract says they will not mine nearer than 50 feet of the main building or the hospital building. What is 50 feet to these buildings? All one has to do is to look at the property across the highway from the home to see what will happen to the buildings on this property. The blasting will probably be the cause of a number of deaths in the home, the grounds will be torn up and be unsightly. The chart shows the main strata runs under the main body of the buildings, the water well is in the deepest part of the bauxite vein.

The residents of the home appeal to the Sons and Daughters to help us and see that an injunction is asked for to prohibit the work upon the property at any time as long as we live here. It can be made to read until the legislature meets in January, 1933, which will be only a few months and will not hurt the mining company to wait that long.

The pensions have ceased to be paid and now the peace and quietude of the home is going to be disturbed. Please Gazette, veterans, Sons and Daughters of the U. D. C., come to our aid and stop this work before it is too late. If the mining company members, the people over the state, state officials and others come to the home and see a large number of these elderly people on what is probably their deathbed, unable to walk, talk and some unable to see and a number unable to feed themselves, there would be a feeling of love go out to them and this greed for a few dollars would cease as far as this home property is concerned.

The Bible gives us three things to judge, faith, hope and charity. The greatest of these is charity or love for humanity.

Mrs. George W. Hill, Sweet Home, Ark.

FIGHT ON BAUXITE CONTRACT STARTS

Four U.D.C. Chapters Protest Lease on Confederate Home Property.

Gazette 1-20-32

PLAN ATTACK IN COURTS

S. C. V. State Commander Says Investigation to Be Made to Determine Proper Procedure.

Four chapters of the United Daughters of the Confederacy in Little Rock and North Little Rock, meeting at the Hotel LaFayette yesterday, adopted a resolution protesting against lease of mineral rights to the Confederate Home property three miles southeast of Little Rock.

A committee of 25 members of the organization took the resolution to the capitol to present it to Governor Parnell, but he was out of the city. Members of the committee conferred with Attorney General Hal L. Norwood regarding the contract and announced their intention of contesting the state's right to lease the property for mining of bauxite without specific authority from the legislature.

Mrs. R. J. Lea, state chairman of the U. D. C. Committee on Relief and Entertainment of residents at the Confederate Home, said she is positive that the property was donated to the state under the condition that it should be used for no other purpose as long as it is needed as a home for Confederate veterans and their widows. She said this angle will be investigated and, if the deed is found to contain such a provision, suit will be instituted to set aside the mineral lease.

54 Acres Involved. A contract was executed Saturday, leasing mineral rights to 54 acres of the property to the Pulaski Mining Company for 10 years. The contract was made by State Revenue Commissioner David A. Gates under authority of Act 212 of 1929, which authorized him to lease sand and gravel and "other mineral rights" to state lands.

The lease contract, approved by Governor Parnell, Attorney General Norwood and G. C. Branner, state geologist, provides that the company must remove a minimum of 10,000 tons a year and that all mining must be of the underground type, so as not to molest the surface. No processing is to be done on the grounds, but the green ore is to be trucked off the grounds for processing and shipping. No mining is to be done within 50 feet of any building.

J. S. Utley, former attorney general and now state division commander of the Sons of Confederate Veterans, said last night that an investigation will be started by that organization soon to determine if steps should be taken to cancel the contract. He said there appears to be a "widespread demand for an inquiry as to the propriety and legality of the contract." He would not say what direction the proposed investigation likely will take.

Representatives of the Church Hill, Memorial and Keller chapters of the U. D. C. of Little Rock and of the Ramsey chapter of North Little Rock, adopted a resolution which said in part:

"We protest against destruction of the peaceful quietude of the Confederate Home, feeling that the state has not reached the point of destitution where for a few dollars we would need to rob the old veterans and widows of veterans of the restful quietness that now surrounds them in their last days."

The resolution added that the U. D. C. feels that it is the duty of the organization to present a vigorous protest to the governor.

Legislator Critical. Senator G. W. Hendricks, who sponsored a resolution adopted by both branches of the General Assembly at the special session last October, expressing the sense of that body that the act of 1929 did not contemplate that bauxite mining rights could be leased under the statute, said last night that he believes the lease is "illegal and an improvident venture," but declined to say whether he will join in a movement to contest validity of the contract.

The resolution adopted by the legislature was vetoed by Governor Parnell on the ground that it related to matter not included in the call for the special session.

G. C. Branner, state geologist, said yesterday he had not considered the lease from a sentimental or legal viewpoint, but that it was his opinion that from an economic and commercial standpoint the state was "very fortunate" in obtaining such a contract.

He said the terms of the lease are so favorable to the state that he is confident no other bauxite operator in the country would offer better terms. He added that the contract protects the state and the Confederate Home fully against caving, settling or other sacrifice of the surface of the property. He said it is believed by many familiar with the bauxite deposits in that section that 20,000 to 30,000 tons of green ore may be mined annually over a period of 10 to 20 years.