

News of Other Days

Fifty Years Ago.

(Arkansas Gazette, September 25, 1887.)

That Arkansas minerals are attracting a great deal of attention abroad is demonstrated every day by the letters of inquiry about them that come pouring in. Men who have money to invest, and who will invest it nowhere where there is any doubt of the wisdom of the investment, are particularly interested. Yesterday Messrs. G. N. Tillman of Birmingham, George W. Ware of New York and George Little, state geologist of Mississippi, arrived here to look for a location for a smelter. They were taken to the exposition building where 10 tons of manganese from the mines of Mr. Hiram Robbins, 10 miles from this city have been placed. The gentlemen were surprised that the mineral could be found so near the city, but it gave Little Rock another advantage to offer for the location they were seeking. They left for Batesville last night to inspect manganese mines, after which they will return to Little Rock. They propose making large purchases of manganese and iron lands.

Manganese Production Tops 1936

Special to the Gazette. 10-17-37

Cushman, Oct. 16.—Reed Denison said today that manganese production from the Batesville-Cushman field will be approximately 3,000 tons larger this year than last. There is a good demand for the higher grades of ore, but the price is not as satisfactory as it should be, he said.

The Arkansas Manganese Company, a new concern in the field, is operating the Aydelott mine on a lease and making a good production. They are mining oxide ore and are washing some of it from the ore bearing dirt. They have a log washer in operation that handles about six tons an hour.

New Digging Opened.

Walter H. Denison is opening a new digging in Pine Hollow, three miles west of Cushman. It is what is known in the district as a hard rock mine, and the property is being equipped with a compressor that will operate two jack hammers. They are starting in on an irregular blanket vein that carries both carbonate and oxide ore.

The same concern is beginning side drifts from the main tunnel at the new Clughouse mine, which is located one-half mile west of Cushman. They have spent the last two years in driving this main tunnel through the mountain on the ore vein, taking out about 2,000 tons of ore in the operation. The tunnel is 700 feet long. They have several years' production ahead of them in this mine. They are breaking the ore with jack hammers, power for which comes from the power plant at the old Clughouse mine, across the hollow. The latter has been operated by Mr. Denison for the last 10 years and is about exhausted, although some pocket mining is still in progress there.

Mr. Denison expects the field to market some 10,000 tons of ore this year, against 7,000 tons last year. About three per cent of the production will be carbonate of manganese and the rest will be oxide. The bulk of the production will run from 30 to 40 per cent.

World War Would Put Small Arkansas Town In Limelight Again

Evening Shade—In the event of another World war, the little community of Cushman might become highly important, for around it lie one of the few fields of manganese in Arkansas. And manganese is essential to the making of steel used in the manufacture of munitions.

The little town came into being because of this brownish ore, some in lumps, and some lying in heaps like brown dirt. Old-timers tell the following story of the establishment of Cushman:

A decade or so before the Civil war one Henry Newman, bitten by the wanderlust bug, ventured as far from his native North Carolina as the present site of Cushman. A tribe of Indians, presumably of the Osage nation, lived there then.

There are several more or less logical stories as to how Newman acquired land. But, to sum it up, he bought 250 acres for his new home. He cut the trees off one hillside, and built a log cabin. This home was graced in the course of time by a wife. She was Miss Betsy Rogers,

the daughter of one of the few settlers of this part of the state. Many families in and around Cushman are descended from this couple.

A few other settlers came to the section. In 1885 a small one-room schoolhouse had been put up, and Miss Nancy Dodd was the first teacher.

In 1886 came the discovery of manganese. Someone noticed the stuff which lay round about. At first it was thought to be iron ore. Assays showed it to be manganese, important in the manufacture of steel. It is put into the molten mass of steel to absorb the gasses. It also makes the steel tougher.

An Eastern company, hearing of the discovery, wrote and offered to buy or lease the land. Apparently vast quantities of the ore existed. Many persons came to work in the mines, and they and their descendants still live there. The land is unsuited to farming, so mining constitutes the main source of livelihood. New mines even today are being opened.

W. H. and Reed Denison are the main shippers of manganese. So important did manganese become during the World war that prices shot "sky high." A period of unparalleled prosperity came to the little town. The mineral rights alone brought high prices.

Times are not so good now, although a considerable tonnage of the ore is mined and shipped. Much native stone is shipped from the area around Cushman. This is mainly used by the government in revetment work.

To return to the past, however. The town was named for Mr. Cushman, president of the mining company. He was also instrumental in getting a railroad branch built from Batesville to Cushman. This was in 1887. Before that time the ore had to be hauled by wagon. The first hotel was built in that year by Henry Frazier.

Miller Seeks Approval of His Manganese Purchase Bill. Gazette 3-9-38

Washington, March 8 (P).—Senator Miller (Dem., Ark.) asked the Senate Military Affairs Committee today to approve his proposal for government acquisition of manganese for steel making as a national reserve. Under a bill introduced by Miller, up to \$40,000,000 would be appropriated for the purchase of domestic manganese ores and concentrates containing a total of 554,000 long tons of metallic manganese.

Miller's Bill Is Studied by Senate Group Democrat 3-22-38

Senator's Measure Seeks Subsidy for Developing Manganese Sources.

By B. N. TIMMONS.

Washington—Senate investigations into the steel scrap export situation have turned into a general hunt for the right thing to do about all war materials from coffee to steel, it became apparent today.

Although hearings on a bill to embargo shipments of steel scrap are scheduled to be reopened April 5 by a Senate military affairs subcommittee, it is doubtful, according to Senator Thomas of Utah, chairman, that it will get much more serious consideration and it is doubtful that an embargo bill will be passed.

Another member of the subcommittee, Senator Edwin C. Johnson of Colorado, said he wants to see exports continued because "we ought to export as much of everything as we possibly can."

The hearings started off as an investigation of various bills in both houses, bills providing for an embargo on scrap exports and others providing an investigation of the situation. But now it has turned into a search for the proper way to develop preparedness for materials the country would need in case of war.

Miller's Bill Studied. This last started when the subcommittee took up a bill introduced by Senator John E. Miller of Arkansas providing a subsidy for developing manganese deposits in the United States. The deposits here are not rich enough to be worked in competition with foreign deposits so practically all the manganese used is imported. Miller's bill would open up the lower grade deposits in Arkansas, South Dakota and elsewhere by having the government pay a high enough price to make their operation profitable. Under the plan, the government would not only pile up a large reserve, but would have the plants available and in operating order if necessary in time of war.

With this start, the subcommittee looked into the position of other commodities which the country does not produce and which are necessary. The list includes coffee but

not tea. While both are needed, the coffee sources could easily be cut off in case of war, while tea comes from so many different places that there is little danger of it being shut off. Being given similar consideration for much the same reasons are tin, nickel, rubber and similar commodities, all alike in that they are needed but are not produced here.

The subcommittee is considering drafting a general plan to cover all these things in a preparedness program, to build up large reserves of them. Thomas said there is little probability of such a measure being introduced and passed this year. When the time comes, he said, the manganese plan may be sent up first as a trial balloon to learn the attitude of Congress and the country toward it.

Navy Buys Its Manganese In U. S.

Gazette 4-3-38

Washington, April 2 (P).—Senator Miller (Dem., Ark.) expressed gratification today at the Navy Department award of contracts for purchase of 11,500 tons of ferro-manganese domestically instead of buying it outside of the United States. He has offered a bill providing for purchase by the War Department of 554,000 tons of ferro-manganese domestically as a national defense measure.

"The navy's awarding to two domestic companies contracts for ferro-manganese produced entirely from domestic ores is a significant step toward putting the national defense on a sound basis," Miller said. "It is a small beginning but it demonstrates the soundness of the idea."

The navy ferro-manganese will be acquired from sources in Arkansas, Tennessee, Virginia, West Virginia, Montana, Colorado, Utah and Idaho.

Incorporation Matters Democrat 4-4-38

The Walter H. Denison Manganese Company, Inc., of Cushman, Independence county, having an authorized capital of \$100,000, filed a certificate of incorporation at the office of Secretary of State C. G. Hall today.

Mining operations in the manganese fields of north central Arkansas and the marketing of the ore is proposed by the company. The incorporators are Walter H. Denison, J. Reed Denison and A. Milne Denison, all of Cushman.

SEN. MILLER TELLS OF MANAGENESE CRISIS



Newport Weekly Independent 4-1-38

Arkansas' junior senator, John E. Miller, joins with Sen. Jas. Murray of Montana and Rep. Francis Case of South Dakota in a legislative drive to encourage domestic manganese industry. They consider it a grave crisis as looming foreign wars threaten to cause a shortage of this mineral which is used to harden steel.

Gazette 6-23-38 NOTES OF THE DAY.

Manganese, vital in steel making, is found in 20 of the United States. In 1936 it was produced in 14 states, headed by Montana, Virginia, Arkansas, Minnesota and Michigan, yet the production is far short of the country's needs. About 13 times as much as is produced here must be imported, and a recent shipment of 6,000 tons of the ore received at Baltimore had

come from East Africa. Russia produces about half the world's supply, and the other chief sources are India, Brazil and the African Gold Coast. Manganese was used in small quantities for various purposes by the ancient Egyptians, says a bulletin of the National Geographic Society, but there was no considerable production until after the American Civil war. The heavy demand for the metal grew up with the steel industry. Here its important function is to take the "hot air" out of the steel. During the smelting of steel the addition of manganese eliminates all air bubbles and blow-holes and makes the finished product harder, stronger and less porous. Though 92 per cent of the manganese goes into steel, it is used also in making iodine, chlorine, dry cell batteries, disinfectants, etc.

LATEST EXPERIMENTS MAY INCREASE USE OF ARKANSAS MANGANESE 7-3-38

Engineers in the Westinghouse Research Laboratories in Pittsburgh, Pa., are experimenting with a battery of electric furnaces that get steel so hot that it stretches like taffy candy.

Results of these experiments are being watched eagerly by operators in the Arkansas manganese fields, because manganese takes the air bubbles and blow holes out of steel, making it less porous, harder, stronger and builds up resistance.

The battery of electric furnaces being used at Pittsburgh test steel alloys used in the high speed machinery of

blades of the turbine have only a few thousandths of an inch clearance, it is possible for a little "creep" to be disastrous.

Through the development of steel alloys in which the "creep" can be either reduced or eliminated, it will be possible to find increased uses for them. In this way, the amount of manganese that is required will be increased.

Of the 14 state producing manganese, Arkansas ranks with the leading five in the output. The other four leaders are Montana, Minnesota, Virginia and Michigan. But despite the fact that 20 states have manganese deposits, only a small part of this country's consumption comes from within the borders of the United States. In fact, almost 13 times as much manganese ore is imported as is produced here.

Rarely occurring in a pure state, manganese is grayish white with a reddish tinge, resembling iron. While it is soft in the pure state, it is ordinarily hard and brittle. Use of manganese dates back to the early Egyptians, but it was not until after the War Between the States that it was produced in large quantities. Even today many countries have not exploited their deposits of manganese ore. Russia produces more than half of the world's supply and India, Brazil and the African Gold Coast produce part of what is used.

Arkansas Leads Production.

Last year operators in the Batesville-Cushman field mined and shipped more high grade manganese ore than any domestic field. Both high and low grade ores are found in this field. All that which runs below 30 per cent metal is classed as low grade, and that above as high grade. The Batesville-Cushman field embraces an area about 15 miles wide and 25 miles long in Independence, Izard and Stone counties. Cushman, in Independence county, is the center of the industry. For the most part the ore is mined by an open cut and shaft and drift methods, although in some instances where the ore lies close to the surface steam shovels are employed.

Like nitrates, the bulk of manganese ore is consumed in places distant from its sources. Large production is in outlying, less highly industrialized regions, and it can stand the cost of long shipments only because it is so essential in the manufacture of steel. It must enter steel destined for almost everything, from razors to locomotives. Russia is the only country that has within its borders sufficient manganese to supply its needs. During and immediately after the World war manganese shortages threatened steel industries in Western Europe and the United States, because of shipping restrictions and revolution in Russia.

Ninety-two per cent of the world consumption of manganese goes into steel, but there are other industrial uses for it. It serves in the making of iodine and chlorine, and its salts are vital to the manufacture of disinfectants, deodorizers, sterilizing agents, photographic developers and leather. Permanganates or manganese salts are important for lumber preservation and the bleaching of fabrics. Manganese dioxide or pyrolusite is used in dry cell batteries.

Manganese is essential to plant and animal nutrition. Most soils contain enough manganese for plant life, but in some sections a lack of it retards and even prevents growth. Demonstrations have shown that addition of small quantities of manganese sulfate makes fruitful land formerly considered useless for cultivation.

Big Manganese Deposit Found By Surveyors

Special to the Gazette. 9-11-38

Batesville, Sept. 10.—One of the most valuable discoveries of mineral made by the state mineral survey in Independence county is a new manganese ore-bearing area that lies in parts of Sections 11 and 12 in the Floral neighborhood, 16 miles south of Batesville, in the south part of the county.

William Rhinehart, county survey director, estimated the deposit contains a minimum of 1,000,000 tons. It is disseminated ore and is associated with sandstone. Some of the larger chunks of free ore that have been recovered from the deposit have been assayed and run as high as 54 per cent metallic manganese, which is well up in the high grade class.

Most of the ore now being mined in the Batesville-Cushman manganese field is chunk ore. In order to recover the values from the newly discovered deposit it will be necessary to establish leaching or electrolytic equipment.

Mr. Rhinehart has also directed his attention to deposits of fine manganese that occurs in a distinctive black dirt formation in several sections of the county. He said that the tonnage of this crude ore is gigantic, running into millions of tons. Assays show this char-

acter ore runs from 10 to 30 per cent metallic manganese. In order to mine and recover the mineral content of this character of ore successfully, leaching or electrolytic equipment would have to be installed. No such equipment is being operated in the field now. Practically all the ore that is being mined and shipped is boulder ore, which needs no treatment after it is taken from the ground.

Road Materials.

The survey has saved WPA and the county a large sum in rock for road surfacing. A road is under construction now from Pleasant Plains to the west line of Independence county. Gravel was being hauled from Rosa, a distance of 20 miles, for surfacing. The survey located a body of surfacing stone a quarter of a mile from the new road. Construction costs have been reduced \$1 a yard for surfacing material as a result of the discovery.

Rocks adaptable for the manufacture of rock wool have also been found and a plant to make this product is now under construction four miles west of Batesville.

The water resources have been ex-

plored, and the Ozark spring, which was a popular watering place in the early history of the county, has been relocated and checked. An analysis of the water shows it to be one of the strongest mineralized springs known.

It contains 3.57 solids, which consist of iron, chlorides, sulphates, magnesium and ammonia. The spring runs about two gallons a minute. In the past a good road led up the mountain to it, from Jamestown. Numerous summer cottages covered the mountain-side around it. A summer hotel did a good business.

Big Manganese Deposit Again Located 11-13-38

Special to the Gazette.

Cushman, Nov. 12.—Miners working on a Denison lease, eight miles west of Cushman, are down 129 feet in a shaft which is the deepest that has been sunk in the history of the Batesville-Cushman Manganese field.

The last 34 feet had been through solid manganese ore that runs about 32 per cent, which is in the low grade class, and they are not through the vein. This is one of the thickest veins of ore of this class that has even been found in the field, and it promises to produce a large tonnage of ore.

This body of ore is not a new discovery in the literal sense but has been lost for many years. Years ago it was mined from the side of the mountain, miners taking the ore out of a large room. The over-burden was so heavy that it gradually settled and they had to abandon the digging. Attempts have been made by miners numerous times to re-locate the deposit by driving tunnels into the old drift, but they were unsuccessful. The heavy over-burden either caved in their drifts, or they drove them too high.

New Exploration Method.

Several months ago two miners working on the lease conceived the theory that if they would go higher up on the mountain and drive a vertical shaft they would strike the ore, and they were successful. The depth of shafts in the field has never been over 100 feet before this shaft was sunk, as miners here have always reasoned that no ore would be found deeper.

A few years ago an Eastern steel concern took an option on the property with a clause that allowed them to prospect it before they purchased it. They sank eight shafts up to a depth of 50 feet, struck no ore, and thinking there was no ore of consequence on the property, did not take up their option. Now all the men who have mined the property before wish they had explored deeper.

Edward Thoma and E. R. Swindler, who recently took a lease on the Martin land four miles west of Cushman, on Lafferty Creek, have encountered a good run of manganese ore on the property and are making a good production. They are mining the ore from tunnels driven into the side of the mountain. They have taken out two cars to date, with plenty of ore in sight. They are mining both oxide and carbonate ores of good grade.

Carbonates Increase Reserves.

For many years only the oxide of manganese ores were mined in the field. Carbonate of manganese which was discovered several years ago, has increased the potential reserves of the field enormously. The carbonate ore runs in blanket veins and is continuous over most sections of the field where the for-

mations are still in place. In some of these blanket veins of carbonate where the overlying formations have been cracked, allowing water to wash through them, the ore has undergone a chemical change, turning to oxide and most of the mines now that produce carbonate also produce oxide.

DEFENSE DISCUSSIONS AROUSE INTEREST IN MANGANESE DEPOSITS

11-27-38

By CARUTH S. MOORE.

Evening Shade, Nov. 26.—Every time people begin talking about war—anywhere—people in northeast Arkansas begin wondering about Cushman, center of one of the largest fields of manganese in North America. War means munitions, and munitions require steel. Steel cannot be made without manganese.

Cushman has already suffered varying fortune, directly connected with war and its subsequent demand for manganese, the ugly, dirty-looking substance essential to the making of clean, shining steel.

Nobody knows how many million tons of manganese lie around the little village. It forms entire hills. It crops out where culverts have been laid across the highway. It lines the water courses of the streams thereabouts, and colors their flow. It lies under foot, everywhere, in chunks, mixed with sandstone and limestone, and even in powdered and granulated form.

Manganese Built Town.

Manganese was directly responsible for the development of a lone settler's home into a town. A decade before the Civil war, so the old timers tell you, a man named Henry Newman was bitten by the wanderlust bug, and wandered as far away from his native North Carolina as the site of the present Cushman.

Several more or less logical stories of his dealings with Indians, presumably the Osages, are told. To sum these up, he bought 250 acres of land from the redskins, cut down enough trees from a hillside to build a cabin and in due time, installed the former Miss Betsy Rogers in the cabin as his wife. A few other settlers drifted in. In 1885 matters had progressed far enough that a one-room schoolhouse was put up. But the next year, 1886, some one noticed the brown stuff that lay about everywhere. Out of curiosity, they sent enough of it away for an assay. "Manganese" was the verdict.

The news spread. An Eastern company leased the territory and began to mine the mineral. Settlers flocked in, and have remained, to work in the mines. This still forms the chief means of livelihood for the people.

The town was named for a Mr. Cushman, president of the mining company. He was instrumental in getting a railroad built in 1887 from Batesville to Cushman.

Boom During World War.

So important did manganese become during the World war that a period of unparalleled prosperity came to the little town. Prices soared sky high. A miner's daily wages trebled those in ordinary times. Landowners sold the mineral rights of their land for thousands of dollars.

But since then manganese prices have dropped, until, at times, little has been mined. The production from the Cushman field has been increasing, however, for the past three or four years. W. H. Denison and son, Reed, are now the largest producers in the field.

From discussions of the nation's defense plans, residents believe things are definitely "looking up" in Cushman. There is much talk among the miners of "the government going to buy up the ore."

Few people know how manganese, which may look like a brown or black chunk rock enters into the making of steel. The substance is put into the molten masses of metal when it is white-hot, for two reasons: One, to absorb the gases which would make "holes" or faults in the finished metal;

Gazette

and two, to make it ductile. That is, so that it may be shaped into the many articles made from steel and used in our present day lives.

Steel Right Handy Stuff.

Bullets are not the only things made from steel today—not by any matter of means. It has been said that the average American begins his day with a signal from an alarm clock made mainly of steel. He may take a bath or a shower in a bathtub, or under a shower fixture, both made with steel, with water run through steel pipes. Next he dries on a towel woven on steel looms, shaves with a razor of steel, standing before a mirror rolled between steel rollers, and dresses for the day in clothes that were woven on steel looms, and which contain many pieces of steel.

Then, breakfast, cooked, if his wife uses a gas or electric range, on a steel stove. He may eat oranges or drink milk taken from a steel refrigerator. His subsequent meals contain food preserved in steel cans of tin plate.

His automobile, his modern desk chair, the elevator which whisks him up and down to his office, the telephone he talks over, his typewriter, the electric lights through which electricity comes from steel wires, his bedsprings at night, and many other things too numerous to mention, all are made altogether or in part, of steel. For each of these articles there is a special steel, and here manganese enters again.

Methods of Manufacture.

Different methods of manufacture, that is manipulation at different temperatures, with the addition of varying amounts of manganese, result in these special steels. There are three methods of making steel in common use today, namely, the pot-furnace, open-hearth and Bessemer.

To describe these briefly: The first consists of melting the iron, to which carbon, manganese, and other substances are added, in small vessels or "pots." Frequently odds and ends of steel and old iron are melted up by this method, resulting in low grade metals. These are used in articles not requiring the higher grades. Steel so made is often termed "pot steel." It is possible, however, to absorb its impurities by addition of manganese in considerable quantities, and to use it even for the making of tools.

The open-hearth, or Siem-Martin process, gives a very malleable steel. A portion of the iron is oxidized in this process, and this oxide of iron would make the product hard and unworkable, were it not for manganese again. Manganese absorbs the oxygen because it has a greater affinity for it than the iron has.

The Bessemer process is perhaps the best known. This consists of a violent stirring of the molten metal, which is literally torn into spray by mechanical means. By this means the pure steel is separated from the lighter slag and other impurities contained in it. The problem of handling the molten metal, and keeping it molten while subjecting it to as many as 1,500 streams of air, is necessarily difficult. A silicon is used abroad for a lining of the huge, dipper-like cranes which pour it. Manganese is so used here.

New Deposits Discovered by WPA.

One of the most valuable discoveries made by the mineral survey now being conducted in Arkansas by the WPA is that of a new manganese bearing ore that lies near Floral, Independence county. It is undoubtedly a part of the Cushman manganese field. The new find is 16 miles south of Batesville.

The deposit has been estimated at 1,000,000 tons. While much of it is in powdered and decimated form, there is also much chunk manganese-bearing rock. Some of these "chunks" show as high as 54 per cent manganese, it is said by those making the survey.

The survey established the fact that there are large deposits of fine manganese in a distinctive black dirt formation in the county, not hitherto recognized as valuable. Assays of the dirt show 10 to 30 per cent metallic manganese.

In order to mine this type of manganese leaching or electrolytic equipment would have to be installed. No such equipment is used in the Cushman field now, the "chunk" or boulder ore needing no treatment after it is taken from the ground.

U. S. Buying of Manganese Sought by Batesville C. of C.

1-27-39

Special to the Gazette.

Batesville, Jan. 26.—The United States government would become a large purchaser of manganese ore under terms of bills pending in Congress, it was said in a letter received by the Chamber of Commerce from J. Carson Adkerson, director of the American Manganese Producers Association, Washington, D. C.

The Chamber of Commerce telegraphed Senators Hattie W. Caraway and John E. Miller asking them to use their influence to have the Thomas bill amended so it will give preference to American manganese producers.

The chamber also asked Congressman Wilbur D. Mills to support a similar measure pending before the House Military Affairs Committee. Its provisions are similar to those of the Senate bill, except that it gives preference to domestic producers.

Enactment of either of the measures, it was said, would increase production in the Cushman field near Batesville to the highest point since World war days.

Cushman's Manganese Field Will Become Very Valuable If Another War Is Launched

CARUTH S. MOORE.

Evening Shade.—In the event of a general war, or even if the United States only continues its preparedness program, the manganese deposits of north Arkansas may become highly important.

Chief of these is the Cushman field, near Batesville, one of the largest in North America. This field has been worked, more or less spasmodically, since its discovery in 1886. During the World war a record impetus was given the mining.

A bill now pending before Congress provides for the buying and storing of immense stocks of such materials as manganese, tungsten, tin, and other ores Cushman expects to cash in on this.

Used in Steel.

Manganese is important because it is essential to the manufacture of steel. And, steel is used to make armaments. Manganese, when added to the molten iron and other ingredients which go into the making of steel, absorbs the gases in the mixture. It also makes the steel capable of being shaped. The higher the grade of steel, such as that used for the manufacture of fine firearms and expensive tools, the more manganese needed.

It is not known how many square miles are contained in the Cushman field. Manganese exists in all known forms there powder, lump or boulder, and vein formations. The deepest shaft in the field is 129 feet. The last 34 feet have been through solid manganese ore, which runs about 32 per cent. Such a per cent is low grade. But, the fact that there are continually being discovered such deposits of manganese, in spite of the fact that the field has been worked so long, argues the large quantities available.

For many years only the oxides of manganese ores were mined at Cushman. Carbonate of manganese was discovered several years ago, and enormous reserves of the last named substance are now found to exist. The carbonate ores, run in blanket veins, and is continuous over most sections of the field. Water often runs into the veins where the oxides exist, changing them to carbonates.

New Methods Predicted.

W. H. (Walter) Denison, and his son, Reed, are principal owners and operators of the Cushman field. A mining expert recently made the statement that so crude have manganese mining efforts been in the past, that probably 1,000 tons of so-called low grade stuff has been wasted for every ton of high grade ore taken out of American fields. He predicted that, in the event of another World war, science will find methods to utilize the low grade manganese and the by-products of the ore.

This expert also said that it was very probable that oil and gas existed in or near the Cushman fields. If this were the case, a cheap fuel would enable factories to be built where the ore was mined. As it is now, the ore is shipped to the East, where it is made into steel, and sold back to Arkansans at high prices.

Aside from its use in armaments, steel plays an important part in the modern person's life. It has been pointed out by a leading steel manufacturer that the average man

in a modern city rises from his bed, which has springs of steel, shaves with a razor of steel, using water which had been brought into his home through pipes of steel.

Steel Indispensable.

He wipes his face on a towel woven on looms of steel, steps into an elevator of steel, is whisked to his office in an automobile, many parts of which contain the same substance. Arriving at his office, he talks over a telephone, in the construction of which steel has largely entered, and may dictate into a machine made in the same way. Back at home, he listens to a radio, and eats food preserved in cans with steel linings or stored in a refrigerator in which one of the materials is steel. If the food was cooked on an electric range or a gas stove, the same thing is true. And so on, ad infinitum.

Cushman was founded by Henry Newman. He came from his native North Carolina, and, according to several more or less logical stories as to his dealings with the Indians, bought a considerable tract of land from the Osages. In the course of time he married Miss Betty Rogers, a daughter of one of his few neighbors.

By the time of the Civil war quite a village had sprung up. In 1885 a one-room schoolhouse was built, and Miss Nancy Dodd installed as the first teacher.

Soil Not for Crops.

But the soil around Cushman was largely of a dark, greasy looking substance, rather averse to growing crops or gardens. Many boulders and lumps of the same substance lay about, apparently good for nothing but to stumble over. Many people thought it to be a form of low grade iron ore. Moved by curiosity, someone finally sent a specimen for an assay. The substance was pronounced manganese. The news spread, and an Eastern company leased and bought holdings in the vicinity. Many settlers came to work in the mines.

Cushman has always been a mining town. As has been stated, the soil is not suited to the growing of crops, and the many steep slopes make farming difficult. What soil there is has, in many cases, washed off the slopes, leaving the veins and other formations of manganese exposed.

Demand For Manganese May Increase

7-16-39

By CARUTH S. MOORE.

Special to the Gazette.

Evening Shade, July 15.—North Arkansas's extensive manganese fields, some of which have been worked from time to time for more than 50 years, may become highly valuable in event of a general war, or if the federal government begins buying large quantities of minerals and ores necessary in the manufacture of munitions.

For war munitions are made of steel—and the addition of manganese to other ores is essential in the manufacture of steel. Manganese absorbs the bases in molten masses of iron and other ores. It gives steel ductility, permitting it to be shaped. The finer the grade of steel, the more manganese it contains.

Largest and best known of the north Arkansas manganese fields is the Batesville-Cushman field in Independence county. Worked more or less regularly since its discovery in 1886, its ore seemingly is inexhaustible. Discoveries of deposits totaling several square miles have been made within the last 12 months.

All known forms of manganese are found in the Batesville-Cushman field. These include powder or dirt formation, lump or boulder, and veins. The deepest shaft in the field is 129 feet, the last 32 feet of which was dug through almost solid ore. This "proved" only 32 per cent, which is rather low.

For many years only the oxides of manganese were taken from the earth at Cushman. In recent years carbonates of manganese, running in blanket formation over much of the field, have been discovered. Water running into the veins where oxides exist changes them to carbonates.

It has been said mining operations in north Arkansas have been so crude and wasteful that 1,000 tons of low grade ore have been discarded for every ton of high grade taken out. Scientists are working on processes and methods to utilize low grade ore.

Some mining experts claim oil and gas usually may be found near large deposits of manganese. Discovery of cheap fuel at or near the Batesville-Cushman field, making possible the manufacture of products on the field, would greatly reduce expenses of handling the ore.

The field was opened up by eastern capital but now it is owned largely by Arkansans. Cushman was quite a village at the time of the Civil war, and its farmers had noticed chunks of

a dirty, rather greasy looking substance. Identity of the ore as manganese was not established until years later when someone, out of curiosity, sent a sample for an assay.

Comparatively few persons realize what an important part steel—and hence manganese—plays in our everyday life. It has been pointed out that an average man in a modern city rises from his bed, which has steel springs, and shaves with a steel razor, using water probably piped into his room through steel pipes.

He dries his face on a towel woven on steel looms, steps into an automobile, many parts of which are of steel, takes a steel elevator to his office, talks over a telephone containing steel, and talks into a dictaphone, also containing steel parts.

Back at home, he listens to a radio, operation of which might not be possible except for steel, eats food kept in a refrigerator containing steel and cooked on a stove which probably also contains steel.

60 Arkansas Manganese Mines Open

9-7-39

Special to the Gazette.

Cushman, Sept. 7.—A survey of the Batesville - Cushman manganese field disclosed approximately 60 small mines being worked by from two to four men each. The field includes parts of Independence, Izard and Stone counties, with Cushman the hub. Practically all ore produced this year has been high grade, running from 35 per cent metallic manganese to above 50 per cent. Reed Denison, who handles most of the production in the field, estimates that it will produce approximately 6,000 tons of high grade ore this year, if the present rate of production is continued.

Manganese is an important war mineral and it is expected the demand will increase and the price advance.

No big boom is expected. Large steel concerns have large stocks of Russian high grade manganese. A local operator said they probably have enough for three years. The smaller steel concerns, however, are not so well stocked. During the World war, the big boom in manganese did not come until after the United States entered the war.

Treaties Have Hurt Industry.

The local industry got along very well until trade treaties were made with foreign countries several years ago. The tariff was reduced 50 per cent. That dealt the Arkansas industry a hard blow. Since that time approximately 60 per cent of the high grade ore used in the United States has come from Russia and a considerable part of the lower grade ore from Cuba.

Other states that produce manganese are Montana, Colorado, Georgia, Utah, Washington, Virginia and Arizona. During the past nine years, Arkansas has averaged second in the production of high grade domestic manganese ore. The largest producers in the field now are the lessees of the Walter H. Denison lands Denison & Peterson, and Sims Bros. The lessees on the Walter Denison lands are scattered over the whole field. Denison & Peterson are operating the Polk - Southard, near Cushman, and Sims Bros. of Cushman are operating the Cave mine, near Pleasant Grove in Stone county. The latter mine is a natural cave along a well defined fault line. Much of the ore is mined from the roof of the cave with the miners using ladders.

Field Has Possibilities.

The Batesville-Cushman field is capable of producing an enormous tonnage if a profitable market could be obtained for ore running from 20 per cent up. Mr. Denison said that his concern alone could produce 35,000 tons annually. This field has a bigger reserve tonnage of manganese ore running from 20 to 25 per cent than any other field in the United States.

Wm. Rhinehart of Batesville, head of the mineral survey of Independence county, said that electrolytic plants in the field would solve the low grade problem.

One of the big costs connected with low grade ore is freight to the furnaces. In shipping 20 per cent ore, producers ship 20 per cent metallic manganese and 80 per cent waste. If this ore could be refined here and only the metal shipped, it would reduce the tonnage four-fifths.

Until several years ago manganese always was smelted by heat. The Bureau of Mines installed a electrolytic plant at Boulder City, Nev., for experimental purposes three years ago and it is said that this process can now be applied to manganese ore successfully and economically.

Practically all of the work being done in the field today is by hand.

Manganese Deposits Reported Found in Izard County.

Special to the Gazette.
Melbourne, Sept. 26.—Extensive manganese deposits covering several hundred acres have been reported west of here in the town of Jumbo. Land owners in the community have organized a company and are preparing to begin mining. It is reported that samples assayed 80 per cent.

Report Being Prepared On Manganese Reserves.

Special to the Gazette.
An estimate of manganese reserves will be completed in Independence and Izard counties soon and published by the Arkansas Geological Survey, Dr. George C. Branner said yesterday. The state geologist said the work is being finished by Howard Millar of Murfreesboro and William Rinehart of Batesville. He said all mines and prospective mines sites will be mapped and reserves estimated.

The Arkansas deposits produced 127,560 tons of manganese ore valued at \$2,500,000 from 1881 to 1938, Dr. Branner said. The peak year was 1917, when 140 tons valued at \$448,000 were produced. Dr. Branner estimated that about 20 to 25 per cent of the area's deposits has been mined.

Confident Arkansas Can Supply All the Manganese Needed.

Special to the Gazette.
Some days ago we read in the press that the War Department had expressed fear that our own government might be unable to secure from foreign lands some much-needed war materials, such as manganese, and possibly others. We see no reason for any alarm about manganese. In the northern part of Arkansas several mines are now open ready to produce manganese. They have already taken from those great hills many tons, and as there are untold millions of tons deposited there, all that the government has to do is to make contracts with the mine operators, and miners who are now living in Arkansas will swing into action, so that ample supplies can be in transportation to the mills. In Arkansas there have been discovered some 60 different kinds of metal, and manganese is one. From the best information we have, the mines of northern Arkansas can supply this great nation, War Department included, all the manganese they will need for the next 50 or more years. All the government has to do is to make contracts with the operators and they will be promptly filled. They do not have to depend upon any foreign nation for the supply. This will also give idle American labor a good job.

New Process to Enable U. S. To Refine Own Manganese.

Special to the Gazette.
Chicago, Oct. 24 (AP).—Dr. R. S. Dean, chief metallurgist of the United States Bureau of Mines, said tonight the government had perfected a process by which it could refine enough domestic manganese to make this country self-sufficient. The chief consumer of manganese, a grayish white metal, in the United States is the machine tool industry. It obtains about 96 per cent of its supply from Russia.

Dr. Dean said the Bureau of Mines and the Bureau of Standards had discovered an electrolytic refining process which produced a better grade of manganese—although at higher cost—than that obtained from manganese ore used in industries.

Several companies, he said, have licenses to produce the metal under the government patent.

Dr. Dean said there were several manganese deposits in the United States, especially in South Dakota, Montana, Arkansas and Oregon, but the ore is poor.

Denies Arkansas Has Plenty Of High Grade Manganese Ore.

Special to the Gazette.
A recent writer in the Gazette's From the People column tells about north Arkansas supplying the manganese requirements of our nation.

I wish he would come up into north Arkansas and show us some of these large deposits because we can now sell them to the steel companies even though Arkansas manganese contains too much phosphorus to meet War Department specifications.

I can find plenty of miners who will pay him \$1,000 for showing them a deposit of high grade manganese ore containing 1,000 tons of ore that is not now being worked.

Manganese ore seems to be scarce the world over.

A Manganese Dealer.
Cushman, Ark.

Manganese Miners Await War 'Lift'

Gazette 11-5-39

Special to the Gazette.
Evening Shade, Nov. 4.—Operators and miners in the Batesville-Cushman manganese field do not expect a boom in the industry, but they do count on the present European war and the possibility of this country's becoming involved in it, to provide a needed "lift." Prices of the ore, particularly of the low grade, such as is found for the most part in the Cushman field, has been low the past few years.

Prices soared sky-high during the World war, especially after the United States entered it, but then they dropped so low that it hardly paid to mine the ore. The independence county field is one of the largest in North America. But the manganese industry has been dealt some hard blows in the last decade.

Tariff Removal a Blow.
Chief among these was the removal of the tariff on the ore shipped into this country. Done against the advice of the senators from Arkansas, the congressmen from this section, this enabled such countries as Russia to undersell manganese producers of the United States. Russia, with its low wages and co-operative labor systems, produces raw materials and manufactured articles at costs far below American goods. Russian manganese of higher grade than American ores is said to have been bought and stored away by steel companies for just such emergencies as may lie ahead.

Manganese forms an integral part of steel, the metal used in munitions. There are about 60 mines in the Batesville-Cushman field. Many of these are worked by one or two men. Chief shippers of manganese are W. H. and Reed Denison, Denison and Peterson, and Sims Brothers. Of these the Denisons are by far the largest producers.

It is said that the Denison mines alone could produce 35,000 tons annually. This field has probably the largest reserve tonnage of ore, estimated at 20 to 25 per cent of the capacity of any other field in the United States.

Home Smelters Needed.
One of the big costs to low grade manganese mining is the shipping to furnaces. If the ore runs 20 per cent, this means that 80 per cent waste that is no value is also shipped. If the ore could be refined in smelters near the mines, tonnage would be reduced about 80 per cent.

Manganese usually is smelted by heat in furnaces. The government Bureau of Mines recently placed an electrolytic plant near Boulder City, Nev., for experimental purposes. It is expected that the experiment will show that such a method of refining manganese ores would be easy and profitable for low grades.

Geologist Says Benefication Process Need of Manganese.

Special to the Gazette.
Cushman, Nov. 4.—Hugh D. Miser, veteran geologist with the United States Geological Survey, who has been studying the manganese deposits of this section for the last quarter century, left for Washington, D. C., yesterday, after a week's reconnoiter of the field. During his week's visit here he studied the carbonate of manganese deposits, "covering" all the new mines and prospects which have been opened up on this ore since his last visit. Most of the carbonate ores fall in the low grade class, running from 35 per cent down, and the low grade class is the big problem of the Batesville-Cushman field.

In discussing the market possibilities of low grade carbonate ores, Mr. Miser said: "At the present time there are only two market possibilities for low grade carbonates. One, a national emergency, which would create a high price for them so they could be mined at a profit. The other, to work out some benefication process, which would remove enough of the foreign matter in the ores to bring them up into the high grade class."

While the Batesville-Cushman field mines a big tonnage of high grade ore, the reserves of high grade deposits are only a drop in the bucket compared with the reserves of low grade.

Lou Peterson Back In Field as Operator.

Lou Peterson, who has been engaged at different times in manganese mining in this field during the last 20 years, has started operations again and is making a good production. He is working three properties, the Turner, Polk Southard and Felts. His production is all high grade ore. Most of the ore is boulder ore, ready for shipment as it comes from the ground. His wash ore is being washed and jigged at a washing plant on the Blue Ridge property.

MANGANESE MINING AT PEAK BUT NO FEDERAL AID SEEN

12-11-39

Special to the Gazette.
Cushman, Dec. 9.—Manganese miners in the Batesville-Cushman field were asked this week to submit bids to the government on manganese ore. A bill passed by Congress last year authorized the government purchase of \$5,000,000 worth of this ore, to be held as a reserve. The blank bids received by Cushman operators came from the Procurement Division of the United States Treasury Department.

These blank bids listed ore specifications and procedure of sale. They were so intricate that it is likely that no bids will be submitted from this district. Operators said it is doubtful if any manganese field in the United States could fill the specifications for ore, they are so exacting. Apparently it would take a chemist, with many stock piles at hand from which he could select the proper ore mix, to bring the ore to the exact standard the government demands, operators said.

The government asked bids on three grades, A, B and C. The percentages specified are as follows:

Grade	Manganese	Iron	Silico
	Min.	Max.	Max.
A	48%	7%	8%
B	48%	7%	10%
C	48%	7%	7%
	Phosphorus	Alumina	Zinc
	Max.	Max.	Max.
A	0.12%	3%	1%
B	0.18%	6%	1%
C	0.15%	6%	1%

These specifications, which seem to be hard and fast requirements hardly could be met by miners here. A maximum phosphorus content of 0.18 per cent in Grade B ore is the highest phosphorus content allowed. The high grade ores of the field carry from 0.25 to 0.50 per cent phosphorus, but they are under specifications in other objectionable substances. They carry only from four to five per cent iron, three to four per cent silicon, three to four per cent alumina, which is nothing more or less than clay, and no zinc at all.

Another objectionable specification is the screening requirement. It says: "Preferably all ores should pass a four-inch screen and contain a minimum of fines; however, no ore will be accepted which will not pass a six-inch screen, nor which contains

MANGANESE ORE SHIPMENTS TOP 1939 PREDICTION

7,435 Tons Shipped In Four Months.

1-7-40

Special to the Gazette.
Cushman, Jan. 6.—The production of manganese ore in the Batesville-Cushman field exceeded the 1939 estimate.

A total of approximately 7,435 tons was mined and shipped during the year. Of this approximately 5,465 tons was in the high grade class and 1,970 tons in the low grade class. The Walter H. Denison Manganese Company, Inc., shipped 3,465 tons of high grade and 1,900 tons of low grade. Approximately 2,000 tons of high grade was produced by other operators.

Reed Denison reported his firm shipped more ore during September, October, November and December than it shipped during the entire year of 1938. The war, which brought heavier demands for steel, probably was the cause for a stronger demand for manganese, he said.

"In September, after the demand strengthened, many miners who had been working on WPA and on other jobs returned to mining and some 60 digs were put into operation," he reported. "I do not know exactly how many are operating now, but somewhere between 75 and 100. Some of these miners who are operating on leases are making as much as \$200 a

three went into good carbonate of manganese. The drill cut a good vein of water in the fourth hole before it reached the ore level, and this will be used for a water well. This is the first prospecting done with a churn drill in this vicinity.

In an interview with Reed Denison on the value of drill prospecting, he said:

"I think it would greatly increase the potential ore reserves of the field. Most of the ore mined to date has been mined from the edges of the hills, in broken ground because it can be mined cheaper. But few tunnels have ever been driven through a hill, and but few shafts have been sunk from the top.

"I think in most instances, where outcrops are found on two sides of a hill, the ore vein will go clear through. This has been proven at the Club House mine, which we operated for years."

It is said that the Bureau of Mines will start investigations of ore deposits in the field soon, and it probably will do some drilling to prove the extent of the blanket veins of ore.

While the weather in January was the worst on record for mining, the Denison Corporation produced 190 tons of high grade and 200 tons of low grade during the month. It mined more than they could get hauled and loaded for shipment.

Manganese Deposit Found In Big Cave

Gazette 4-20-40

Special to the Gazette.

Cushman, April 20.—One of the largest caves discovered in the Batesville-Cushman manganese field was found recently on Ozark No. 1 property under lease to Walter H. Denison, six miles northwest of Pfeiffer. Boulder ore was found at four places in the floor of the cave. Some of the chunks weigh as much as 300 pounds, which indicates that some good deposits of ore lie adjacent to the cavern. Shafts are being sunk to locate them.

Dave Dunnigan and associates, who are working the property, drove into the cave at about the 50-foot level while sinking a shaft. The opening to the cavern was about two feet high, between two ledges. Reed Denison recently surveyed the cavern, for a quarter-mile. Some of the grottoes are 150 feet in width with 40-foot ceilings. At one place for a distance of about 200 feet the ceiling descends to within three feet of the floor.

Besides the boulder ore found in the floor of the cave, some peculiar onyx formations were found. There were fewer stalagmites and stalagmites than in most caves in this section, and those found were cloudy with wavy patterns.

Manganese Mill To Install New Washer.

Coy Claxton, official of the Arkansas Manganese Company, has announced that his company is installing a new log washer on the Aydelott property, which it will place in operation soon. The new log in the washer will be 21 feet in length and will give the company a higher grade product than did the shorter log it was using. It will employ a 25 horse power oil engine. The plant will have a capacity of 25 tons of crude ore a day, which will show a recovery of from 40 to 50 per cent of clean ore. All of the ore produced by this company is of high grade, running more than 40 per cent. The firm shipped five carloads in March, running about 50 tons to the car, and has shipped two cars this month.

Manganese Deposit Survey Asked.

Special to the Gazette.
Harrison, May 11.—L. A. Watkins, president of the Missouri and Arkansas railway, has asked the Arkansas State Mineral Survey to determine immediately the extent of a manganese deposit uncovered in White county, near Letona, on the M. & A. Railway. Mr. Watkins and Fred Durst, mining engineer, spent a few days this week prospecting the deposit.

Extent of the deposit has not been determined, but the quality is exceptionally good, Mr. Watkins said. Manganese forms an integral part of steel, the metal used in munitions, and it is expected that the demand for the ore will increase.

Zinc Shipments Regular.

Truck loads of zinc ore from the mining field at Zinc arrive regularly in Harrison. William Thornton has one of the best producing mines in the Zinc field and the most prolific producer for the past month. The zinc is free and is bought by the Manda Industrial Corporation and shipped over the M. & A. Railway.

Federal Tests Of Manganese Deposits Made

5-12-40

Special to the Gazette.

Cushman, May 11.—W. F. Jahn, with the Bureau of Mines and H. D. Miser, with the United States Geological Survey, arrived here this week to select drilling sites to test out manganese ore deposits. The work that will be done here is part of a general plan now being worked out by the government to determine the ore reserves of strategic war minerals, that might have to be drawn on in case of a national emergency. Mr. Jahn said that manganese was the most important of all minerals in this class.

The carbonates and ledge ores, few of which come within the high grade class, are the grades that will be covered by the proposed tests. The market for the lower grades is so low, now that little tonnage is being produced. In case of a national emergency, however, they would assume greater importance, as they can be utilized for the manufacture of steel the same as the high grades.

While it has been proven in a few cases that the carbonate and ledge ores follow through a hill, it has not been determined definitely that this is general throughout the field. These tests will probably settle this question.

Manganese Process Plan Offers Hope

6-9-40

Special to the Gazette.

Cushman, June 8.—William C. Kirkpatrick of Alhambra, Cal., who was active in the manganese mining industry here during the first World war, has worked out a process to beneficiate low grade carbonate ores and bring them into the high grade class.

During the last few months Tom Shell of Cushman has been collecting samples of carbonates for experimental purposes. The beneficiation is a calcining process. The carbonate ore has a limestone base. The ore is heated to a temperature sufficient to convert the limestone into lime, leaving the metallic manganese values intact. From one ton of ore running 28.33 per cent metallic manganese, he recovered 1,560 pounds of ore running 44.09.

Reed Denison of Cushman said there was an appreciable difference in price, based on today's market. The ton of low grade carbonate running 28.33 would have brought \$6.77. The 1,560 pounds of processed ore would have brought \$12.65, a difference of \$5.88.

Big Need for Such Process.
If the process could be worked out on a commercial basis, millions of tons of this low grade ore in the field could be processed into the high grade class.

Four different ore bearing tracts in the field have been selected for drilling by the government and work will start sometime soon. Drilling will be supervised by W. F. Jahn of the Bureau of Mines. This work is a part of the government plan to determine the potential tonnage of vital ores in the United States, of which manganese is the most important.

Rich Manganese Discovery In Pike County Reported.

6-29-40

Special to the Gazette.

Glenwood, June 28.—J. E. Henderson of the North American Manganese Corporation of Glenwood, who has been prospecting and mining manganese ore 12 miles west of Glenwood, in the northern part of Pike county, has opened what is believed to be one of the largest and most valuable deposits of high grade manganese ore ever found in the United States, he said today.

Mr. Henderson is sinking three shafts on a vein of manganese which he has traced and prospected more than a half mile in length. One of the shafts is down 110 feet. This shaft was started on a six-inch vein of ore, and each foot the shaft was taken down the vein widened. Mr. Henderson said. At a depth of 50 feet the vein of high grade manganese was 44 inches wide and at 70 feet, it was five feet wide, and changed to what is known as Pyrolusite ore, the

best and highest grade of manganese ever found, it was said. This ore assays from 68 to 72 per cent from the 70-foot level down to the present depth of 110 feet.

In the past in this territory most of the prospecting and mining has been scratching the surface. Many of the engineers have condemned deep mining, believing the manganese ore was only in pockets and not in veins.

DEMOCRAT 7-1-40 Rich Manganese Vein

Reported at Glenwood

Glenwood—What he believes is one of the largest and most valuable deposits of high-grade manganese ore ever uncovered in the United States has been opened in northern Pike county by J. E. Henderson, of the North American Manganese Corporation of Glenwood. The lode is 12 miles west of this town.

Three shafts are being sunk on a vein of manganese which Henderson said he had prospected extensively and found to be more than a half-mile in length. One shaft, which Henderson said was started on a six-inch vein, is already 110 feet deep. At a depth of 50 feet the vein had widened to 44 inches and at 70 feet it was reported to be five feet wide, and had changed to what is known as Pyrolusite ore. Pyrolusite ore, regarded as the best of manganese ores, assays from 68 to 72 per cent.

Henderson's idea of going deeper to find the higher grade of ore is an innovation in this vicinity. Previously engineers in this section had recommended shallow mining, working on the theory that manganese ore is to be found only in pockets and not in veins.

Exploitation Of Manganese In The County Is Planned

Batesville Daily Grd

A project to drill in the Batesville manganese area is under consideration, Dr. George Branner wired Governor Bailey from Washington yesterday where he has been studying possible development of state resources in connection with the rearmament program.

Quicksilver and manganese are strategic minerals in Arkansas which may be developed by the U. S. Bureau of Mine in connection with the national defense program, Dr. Branner wired the governor.

Dr. Branner, following a conference with the bureau's representative in charge of strategic minerals, said a project "to drill in quicksilver area has been favorably considered, but beginning date not definite." Quicksilver deposits in Pike and Clark counties are being mined. "Project to drill in Batesville manganese area under consideration", the geologist continued. He said Bureau of Mines

representatives, after surveying a Sevier county area producing anti-mony, were "not optimistic as to the quantity of ore available and doubt if their drilling can be economically justified. I am to supply the bureau with additional data which will be considered with respect to the possibility of justifying the drilling program."

A message to the governor from H. K. Thatcher, executive director of the state Agricultural and Industrial Commission, said that a location in the Munsey building had been obtained for the state's office at Washington, established for the purpose of bringing war industries to Arkansas. Mr. Thatcher, Dr. Branner and L. A. Henry, engineer-director of the state Plan-

ning Board, went to Washington to open the office.

TEXANS COME TO LOOK INTO MANGANESE

Mena Star 6-26-40

A party of Dallas, Texas, residents, interested in manganese deposits in the Mena Mining field, was here Tuesday to make inspections and get first hand information about this greatly needed war mineral. The party, headed by C. J. Colp, included Mr. and Mrs. L. V. Ezell, Mrs. Lillie Frazier, Mrs. W. Knowles and E. E. Burns. After making a visit to mineral claims, the party returned to Mena in the afternoon and started back to Dallas.

Drilling Survey to Be Made in Missouri and Arkansas Territory

Marshall Mtn Wave

An extensive drilling survey to determine the presence in commercial quantities of useful minerals in territory served by the M. & A. railway will shortly be started, it is announced by L. A. Watkins, president. Federal agencies and the State Geological Survey will cooperate in the survey and the expense of making the tests will be borne by the government, it is announced.

While zinc and lead are admittedly the most prevalent of any mineral deposits likely to be found in large quantities, there is the possibility that other mineral deposits will be located in this section in sufficient quantity to justify commercial exploitation.

The Federal government is obviously interested in learning the extent of mineral deposits which may have a bearing as a source of supply in the extensive armament program now being started, the State Geological Survey is interested in the development of all natural resources within the state and the railway company is concerned with any industrial activity which offers promise of increased freight tonnage for the road.

The territory in Searcy, Newton and Boone counties will be given first attention in this survey.—Harrison Headlight.

Rich Manganese

Deposit Found

Hot Springs Sentinel
Record In Pike County
6-30-40

Glenwood, June 29 (Special)—What he believes is one of the largest and most valuable deposits of high-grade manganese ore ever uncovered in the United States has been opened in northern Pike county by J. E. Henderson, of the North American Manganese Corporation of Glenwood. The cache is located 12 miles west of this town.

Three shafts are being sunk on a vein of manganese which Henderson said he had prospected extensively and found to be more than a half-mile in length. One shaft, which Henderson said was started on a six-inch vein, is already 110 feet deep. At a depth of 50 feet the vein had widened to 44 inches and at 70 feet it was reported to be five feet wide, and had changed to what is known as Pyrolusite ore. Pyrolusite ore, regarded as the best of manganese deposits, assays from 68 to 72 per cent.

Henderson's idea of going deeper to find the higher grade of ore is an unusual one to this vicinity. Previously engineers in this section had recommended shallow mining, working on the theory that manganese ore is to be found only in pockets and not in veins.

Manganese Deposit Found Near Glenwood

Hot Springs New Era

Glenwood, July 1. — (Special)—What he believes is one of the largest and most valuable deposits of high-grade manganese ore ever uncovered in the United States has been opened in northern Pike county by J. E. Henderson, of the North American Manganese Corporation of Glenwood. The cache is located 12 miles west of this town.

Three shafts are being sunk on a vein of manganese which Henderson said he had prospected extensively and found to be more than a half-mile in length. One shaft, which Henderson said was started on a six-inch vein, is already 110 feet deep. At a depth of 50 feet the vein had widened to 44 inches and at 70 feet it was re-

ported to be five feet wide, and had changed to what is known as Pyrolusite ore. Pyrolusite ore, regarded as the best of manganese deposits, assays from 68 to 72 per cent.

Henderson's idea of going deeper to find the higher grade of ore is an unusual one to this vicinity. Previously engineers in this section

had recommended shallow mining, working on the theory that manganese ore is to be found only in pockets and not in veins.

600 Tons Of Manganese Shipped

8-11-40

Special to the Gazette.

Cushman, Aug. 10.—The Walter H. Denison Manganese Corporation shipped 600 tons of high grade manganese ore during July. Much of this tonnage was mined in the east part of the field around Pfeiffer, and shipped from that place over the Missouri Pacific. The remainder was shipped from Cushman and Penters Bluff.

One car of this ore was carbonate of manganese, and went to the Electro-Manganese Corporation at Knoxville, Tenn. This concern recently has installed a electro-lytic reduction plant at Knoxville and is processing manganese ore from several Southern states.

Report on Test Of Carbonate Awaited.

Reed Denison recently visited this plant.

"While I was down there they purchased a car of carbonate ore from me," he reported. "The ore I shipped them ran about 35 per cent manganese. They had not tried the electro-lytic process on carbonate, and were anxious to see how it would work."

No reports have been received on the results obtained from this car. From the chemical properties in carbonate, it should work well. If it does, this plant probably will offer a market for Arkansas carbonates.

The Ozark Manganese Corporation, which now has headquarters at Mountain View in Stone county, probably will start active mining operations soon. This concern owns 1,240 acres in fee and in leases in the east part of Stone county just across the river from Penters Bluff. It has been prospecting in this area for the last 10 months and

has located some exceptionally good ore bearing strata.

Wad Ore Still A Problem to Producers.

Because of lack of a profitable market for manganese ore running under 50 per cent, production of the Arkansas Manganese Company of Cushman decreased in July. It shipped one car of 50 per cent ore during the month. Most of the ore it is working is wad ore, running from dust size to larger particles. During damp weather, this comes out in large chunks, which break up easily when handled. The ore averages 28 per cent as it comes from the ground. Passing it through a log washer raises the grade to from 33 to 35 per cent. Under the log washing method the loss is much too great, however. Washing two and a half tons of crude that runs approximately 28 per cent, they get from 1,500 to 1,700 pounds that runs 33 to 35 per cent. From the waste which settles in the waste ditch, samples have been recovered that run 50 per cent. J. H. Gibbons, of the Arkansas Manganese Company, has asked the Bureau of Mines to install an experimental plant to handle wad ore, and it is probable that this will be done.

Wad ore is one of the greatest problems of the field. There is an enormous potential tonnage of this ore, but no successful method yet has been worked out to concentrate it economically, and to bring it up into the high grade class.

\$30,000 TO BE SPENT IN TESTS FOR MANGANESE

8-4-40

Special to the Gazette.

Cushman, Aug. 3.—Testing of the carbonate of manganese deposits in the Batesville-Cushman field has been started by representatives of the Bureau of Mines, and the United States Geological Survey. The work is directed by W. F. Jahn, engineer with the Bureau of Mines, assisted by F. A. Rutledge, and T. A. Hendrix, geologist, with the Geological Survey, assisted by M. Gordon.

This work is the most important experimental work ever done in the field, and the findings probably will result in many new investments in the field. Carbonate ores run from 14 to 38 per cent metallic manganese. Recent experiments by the Bureau of Mines in beneficiating this ore show that the grade can be raised to more than 50 per cent by calcining. This ore has a limestone base, and by calcining (or burning) the limestone in the ore is reduced to burned lime, leaving the manganese intact, which brings the grade of the residual ore well above 50 per cent, and into the high grade class. The process is no more difficult than making burned lime from limestone rock. The carbonate ore is first crushed to quarter inch mesh, then burned. That is the entire process.

Trenching, Tunneling Method Decided On.

The first plan set up for testing the carbonate deposits was drilling, but this plan has been abandoned, and testing will be done by tunneling and trenches.

"After thoroughly checking the formations, tunneling and trenching seemed to be the best methods," Mr. Jahn said. "The carbonate ore runs in blanket veins, and these are wavy. At some places they flatten out as thin as a knife blade. At other places they are several feet thick. The thickest sections of the veins might be termed islands. If we drilled, we would have to drill hundreds of holes to get an accu-

rate test, because with a few holes, all of them might hit the thin places only, or on the other hand, hit the thickest places only, and we would have no truly accurate test. So we decided on the tunneling and trenching method, which will give us a much more accurate test of the veins."

The testing will be conducted at five localities in the field, running from the Ozark mine on the east, to Penters Bluff, on the west.

Two Mountains To Be Penetrated.

Two sites have been selected where tunnels will be driven clear through two mountains on the carbonate veins. Samples will be taken every five or 10 feet, which will determine accurately the manganese content of the ore and the average thickness of the veins. Each of these tunnels will be approximately 450 feet in length.

In addition to these two tunnels, 70 trenches will be cut into mountain sides at different sites, back to the unaltered face of the carbonate veins. These trenches will give the width of the veins.

The trenching work will be done with a mechanical drag line or scraper. The tunneling will be done with a compressor and air drills.

Mr. Jahn estimates that the work will take about five months. From 20 to 40 local miners will be employed, which will be a factor in relieving unemployment conditions in the field. It will cost from \$30,000 to \$33,000 to make the test, of which some \$20,000 will be spent for local labor.

While the method of beneficiating the carbonate ore has been worked out, a beneficiation process for wad ore is still in the experimental

stage. The Bureau of Mines is at work on this now. Wad ore is fine ore—much of it as fine as flour—and lies in large bodies in different sections of the field, having a surface appearance of black dirt. It runs from 10 to 20 per cent. An economical beneficiation process can be worked out for this ore, if low grade ore problems of the field will be solved.

has located some exceptionally good ore bearing strata.

Wad Ore Still A Problem to Producers.

Because of lack of a profitable market for manganese ore running under 50 per cent, production of the Arkansas Manganese Company of Cushman decreased in July. It shipped one car of 50 per cent ore during the month. Most of the ore it is working is wad ore, running from dust size to larger particles. During damp weather, this comes out in large chunks, which break up easily when handled. The ore averages 28 per cent as it comes from the ground. Passing it through a log washer raises the grade to from 33 to 35 per cent. Under the log washing method the loss is much too great, however. Washing two and a half tons of crude that runs approximately 28 per cent, they get from 1,500 to 1,700 pounds that runs 33 to 35 per cent. From the waste which settles in the waste ditch, samples have been recovered that run 50 per cent. J. H. Gibbons, of the Arkansas Manganese Company, has asked the Bureau of Mines to install an experimental plant to handle wad ore, and it is probable that this will be done.

Wad ore is one of the greatest problems of the field. There is an enormous potential tonnage of this ore, but no successful method yet has been worked out to concentrate it economically, and to bring it up into the high grade class.

600 Tons Of Manganese Shipped

8-11-40 Gazette

Special to the Gazette.

Cushman, Aug. 10.—The Walter H. Denison Manganese Corporation shipped 600 tons of high grade manganese ore during July. Much of this tonnage was mined in the east part of the field around Pfeiffer, and shipped from that place over the Missouri Pacific. The remainder was shipped from Cushman and Penters Bluff.

One car of this ore was carbonate of manganese, and went to the Electro-Manganese Corporation at Knoxville, Tenn. This concern recently has installed a electro-lytic reduction plant at Knoxville and is processing manganese ore from several Southern states.

Report on Test Of Carbonate Awaited.

Reed Denison recently visited this plant.

"While I was down there they purchased a car of carbonate ore from me," he reported. "The ore I shipped them ran about 35 per cent manganese. They had not tried the electro-lytic process on carbonate, and were anxious to see how it would work."

No reports have been received on the results obtained from this car. From the chemical properties in carbonate, it should work well. If it does, this plant probably will offer a market for Arkansas carbonates.

The Ozark Manganese Corporation, which now has headquarters at Mountain View in Stone county, probably will start active mining operations soon. This concern owns 1,240 acres in fee and in leases in the east part of Stone county just across the river from Penters Bluff. It has been prospecting in this area for the last 10 months and

MANGANESE MINER WITH HUNCH OPENED CARBONATE MARKET

8-11-40

Special to the Gazette.

Cushman, Aug. 10.—Hundreds of tons of carbonate of manganese ore went into the waste piles in the tons of carbonate of manganese ore field before Charles Burrow, Cushman miner, insisted in the summer of 1927 that the heavy, limestone looking rock be assayed for manganese values.

Burrow was working on a contract at the Clubhouse mine near here. Driving a drift on ore, the crew would work a good pocket of oxide ore, then drive through a heavy limestone to another pocket. One pocket of oxide ore consisted of many large boulders which were rather smooth on the surface. Burrow hauled them down to the ore yard, and J. S. Baker, ore buyer, eyed them suspiciously. Picking up a heavy hammer he broke one. The oxide was only a thin veneer over a heavy, gray limestone. He refused to buy the

State's Manganese Production Expected to Increase.

8-19-40 Gazette

Increased production of manganese in the Ouachita mountain area of Arkansas was predicted yesterday by Dr. George C. Branner, state geologist. Two new mining companies, one of which filed articles of incorporation with the secretary of state yesterday, have been organized.

Dr. Branner said 99 per cent of the state's manganese production has come from the Batesville field. Explorations and some mining have been conducted in the Ouachita mountains and increase in price probably would increase activity in the area, he said.

The Dixie Manganese Corporation of Little Rock has carried on prospecting and mining in the North mountain, 16 miles from Norman, Montgomery county, for two months, Dr. A. C. Shipp, one of the incorporators, said. The company has mined more than 100 tons of the "highest grade ore," he said. The company listed 20,000 shares of common stock of par value of \$1 each and 2,000 shares of preferred of par value of \$5 each. Other incorporators are W. C. Stenger, M. C. Stenger and Elsie Shipp, all of Little Rock.

The Texarko Development Company has announced it will begin operations near Mena, Polk county, within 90 days. Its fields are also in the Ouachita mountain range. C. J. Colp and William Robinson of Mena are heads of the company.

Dr. Branner said the price of manganese had not advanced greatly. Forty-five per cent ore is selling for \$25 a ton, he said.

Production has been retarded, he said, because Arkansas ore has not met government requirements for manganese purchased to build up reserve supplies. The phosphorus content is said to be too high.

"This does not mean Arkansas ore is not proper to use in manufacturing ferrous metals," said Dr. Branner. He said some method of blending the Arkansas ore with ores of lower phosphorus content might be worked out to meet government requirements.

Senate Hears About State's Manganese

8-16-40 Gazette

Washington, Aug. 15 (AP).—Arkansas has deposits of manganese, important war material, in Independence, Pike and Polk counties, it was disclosed in the Senate during an address by Senator Ashurst (Dem., Ari.).

Commenting on reports the Defense Advisory Committee was obtaining its war manganese from Brazil where it was necessary to build a railroad to get to the deposits, Ashurst said there was "abundant" manganese in this country and cited a geological survey report indicating deposits in 29 states.

This report indicated deposits in Arkansas at Cushman, Glenwood, Brushy, Brooks and Hogpen mountain; Statehouse, Sugar Tree and Leader mountain and Hanna Range and Shadow Rock mountain.

ore and dumped it in a ditch. Burrow asked him to sample it and have it assayed. He told Burrow it would be a waste of time, because it was only limestone.

But this did not satisfy Charles Burrow. This gray looking limestone rock was too heavy for limestone, he believed. He went to Reed Denison, with whom he had his contract, and asked him to have the sample assayed. Mr. Denison had it assayed, and it showed a value of 38 per cent manganese, which at that time was a salable ore. Checking the heavy limestone they had been driving through, from one pocket of oxide to the other at the Clubhouse mine, they found this also to be carbonate of manganese. The oxide pockets occurred where the overlying stratas were fractured, allowing air and water to penetrate the ore vein, which changed the carbonate to oxide.

Power for Manganese Plant One of Major Goals of Dam.

8-22-40

Special to the Gazette.
Batesville, Aug. 21.—It was learned today that the proposed maximum development of the manganese field in this area was a significant factor in the recommendation by the War Department of a \$79,000,000 development of the White river basin.

Ample production of large unit power in this area would enable the national defense forces to use Cushman-Batesville field manganese in huge quantities by the use of a newly developed electric reduction process especially designed for concentrating low grade ore.

Government to Survey Mena Manganese Field

8-25-40

Special to the Gazette.
Mena, Aug. 24.—If C. J. Colp and William Robinson obtain the assistance from the Bureau of Mines of the Department of the Interior, which they now are seeking, the Mena mining field will be reopened.

While in Washington they conferred with Senator John E. Miller, who arranged a conference with Dr. R. R. Sayers, acting director of the bureau. Dr. Sayers promised that he will send a mining engineer from the bureau as quickly as possible to report on the manganese deposits in the field.

Testing Of Manganese Progresses

9-8-40

Special to the Gazette.
Cushman, Sept. 7.—Testing of carbonate of manganese deposits in the Batesville-Cushman manganese field by the government is progressing on schedule.

W. F. Jahn of the Bureau of Mines, who is in charge of the tests, said that the heavy mechanical equipment necessary for tunneling and open cut work will arrive next week. The surveys of the property to be tested have all been completed and a considerable amount of hand work already has been done. Work has been done on the American Manganese Corporation's land in the east part of the field. Work will start next week on a test on the John Martin No. 1, in the west part of the field. In another 30 days the heavy work will be well under way. It probably will take all winter to complete the tests.

Tests of Arkansas Ore Apparently Favorable.

Last month the Walter H. Denison Manganese Corporation shipped a car of carbonate ore to the Electro Manganese Corporation at Knoxville, Tenn., for experimental tests. This concern recently installed an electrolytic plant at Knoxville for the reduction of manganese ores. The tests on this car evidently were favorable for the

company has ordered five more of which three have been shipped. Reed Denison reported his firm is working one mine night and day to fill carbonate orders for the Tennessee concern.

By a chemical leaching process the ore is converted into manganese sulphate before being caught on the electrodes. It is said that the carbonate ores from this field are the only ores that will make manganese sulphate without heating.

During August the Walter H. Denison Manganese Corporation shipped between 350 and 400 tons of high grade oxide ore and 100 tons of carbonate ore.

Fred Livingston and Preston Grace of Batesville, who are working a 40-acre tract on Lafferty creek, are getting out their first car of ore. It will be shipped from Cushman.

Imports of manganese ore during June amounted to approximately 109,000 tons against 2,300 tons produced in the United States. The largest imports came from the Gold Coast in Africa, and Russia. The former sent in 30,513 tons and the latter 23,724.

States contributing to the domestic production were Arkansas, Alabama, Georgia, Montana, Tennessee, Utah and Wyoming.

Market for Low Grade Ore Still Problem.

Recent comparison show that the Batesville-Cushman field produces the best manganese ore produced in the United States, both oxides and carbonates. If markets could be had for these ores, which run from 25 to 40 per cent metallic content, the field within 12 months could step up its production to from 8,000 to 10,000 tons a month. Or, if necessary beneficiating plants were installed that would beneficiate the low grades into the high grade class, the high grade tonnage could be raised enormously. A market for the low grade ores is still the biggest problem the field has to face.

Ore Mill Near Glenwood Nearly Ready

9-8-40

Special to the Gazette.

Glenwood, Sept. 7.—Working "round the clock" with three shifts of eight hours each, the North American Manganese Mines Development Company expects to complete within 15 days the installation of mill and drilling equipment at its manganese mine 12 from Glenwood.

New electric machinery will be installed next week.

P. J. Miller of St. Louis, president, spent the past week here. With him were J. E. Henderson, Arthur C. Hoehn and Elmer Haase, all of St. Louis, who are connected with him in the work. M. E. Richards of Steelville, Mo., is head of the engineering work and installation of machinery.

Manganese Ore Worked At Glenwood

Democrat 9-29-40

Glenwood—J. E. Henderson, general manager of North American Manganese Corporation, who discovered and opened the large bodies of high grade manganese ore which assays 63 per cent manganese has installed equipment and is working in section 28. The first weeks' work recovered more than 50 tons of high grade ore.

On a lease in sections 5 and 6 they are driving a tunnel from the foot of the mountain back to the large vein of manganese ore which Mr. Henderson discovered and on which he has sunk shafts from a depth of 30 feet to a depth of 165 feet. In each of the shafts he went down, cross cutting the large vein of high grade manganese ore. He has traced and worked this vein a distance of 2,700 feet.

The company installed a light plant, large air compressors, track and dump cars and is working three shifts of eight hours each and cutting an average of 18 feet each 24 hours.

The tunnel is now back 150 feet with less than 100 to go before reaching the large vein of ore.

From the start of the tunnel they have been recovering the high grade

ore in boulder form and Mr. Henderson feels sure they will cross-cut other veins before they reach the large vein in which he has sunk the shafts.

The tunnel, when back to the large large vein of ore will be 285 feet in length. It will require about another week to complete the tunnel back to the vein.

The company also has equipment partly installed to drive another tunnel into another large body of ore which Mr. Henderson has discovered and tested on the same lease, 1,600 feet east of the present tunnel.

Others are coming into the manganese territory. A group of men from Shreveport plan to start operations on a large lease in the next two weeks. Many others are in the territory prospecting for manganese.

First Ore Of Manganese Recovered

9-29-40

Special to the Gazette.

Glenwood, Sept. 28.—Fifty tons of high grade ore were recovered as mining was begun at the North Arkansas Manganese Corporation property nine miles from Glenwood this week.

J. E. Henderson, general manager, said he was "very pleased" with the initial production. He said he expected the mine to become one of the best in the United States.

Operators have installed an electric light plant, large air compressors, track and dump cars and are working three shifts of eight hours each. Drillers are cutting an average of 18 feet of earth every 24 hours.

Mr. Henderson has discovered and tested on his same lease another good body of ore, which is 1,600 feet east of the initial tunnel.

Manganese Data Given To Government

10-6-40

Special to the Gazette.

Cushman, Oct. 5.—Jack Gibbon and Reed Denison, manganese mine operators in the Batesville-Cushman field, returned from Washington this week, after discussing the manganese situation with representatives of the National Defense Commission and the Bureau of Mines. Most of the discussions concerned low grade ore running from 25 to 40 per cent, of which there is an enormous tonnage in the local field, but at present no market.

The Bureau of Mines is working on experimental ore dressing and reduction plants, and is making field investigations of manganese deposits all over the United States. It is expected that the results of this experimental work and investigation will make the United States independent of foreign manganese deposits.

Beneficiate Plant Seen.

"I feel sure that within a few months the Bureau of Mines will work out some process by which our ores running from 25 to 40 per cent can be worked at a profit," Mr. Denison said. "In order that this field can operate successfully, we will have to have some process to beneficiate our low grade ores, and a market that will allow us to produce at a profit during peace times as well as war times."

\$500,000 BENEFIT AT BATESVILLE

Gazette 10-6-40

Batesville, Oct. 5.—A beneficiating manganese plant costing approximately \$500,000 may be located in or near Batesville, J. Fred Livingston, an incorporator of the Arkansas Manganese Mining Company, revealed today. With another World War in progress, it is nearly certain that this plant will be constructed.

If such a plant were to be built here, it would mean one of the greatest booms to Batesville in its history. Mr. Livingston said his company had been dealing with some Eastern capitalists on the proposed plant. He said that plans for the huge plant already had passed the preliminary stages. His company has a mining field of 1,000 acres.

A beneficiating plant processes low grade manganese as well as high grade ore.

Essential to Armaments.

Manganese is an essential element in manufacturing high grade steel. It is a strategic war material, vitally necessary in highly mechanized modern warfare, and for that reason the United States government now has geologists and other mining authorities quietly assimilating lots on all the known deposits of manganese and other valuable ores in this country.

Price and quantity usage of manganese ores react to the demands for the so-called heavy commodities. When war clouds gather and nations gear their factories for the manufacture of armaments, the markets for manganese are best.

The Arkansas area consists of a part of two or three counties on the northern part of the state, mainly in the Batesville-Cushman field and is one of the largest proudest of face ore in the United States.

Under the Hull reciprocal trade agreement domestic manganese mining, like zinc mining, has been affected adversely. This is not so much because of cheap foreign labor, but because of its lower cost of ship load transportation rates to large American smelters.

The manganese found in the fields near Batesville is the purest found anywhere, and "only the surface has been scratched." It is free for the most part of certain objectionable elements, and there are enormous quantities of low per cent ores that by beneficiating processes can be raised in percentage to marketable levels.

A definite location for the proposed plant has not been named. But it is logical that, if constructed, it would be built near a railroad. One of the more probable places would be Cushman, a town of about 600 persons located 10 mile northwest of Batesville. A branch line of the Missouri Pacific railroad goes to this town.

Cushman and manganese have been synonymous since the town came into existence back in the 1880's.

A few people began settling here and there among the hills, choosing between the two major occupations—farming the cotton fields or mining the deposits of manganese ore. These mines were located a short distance from the town of today, and due to the poor transportation facilities, so many of the early settlers chose to farm. A small group of the people continued to mine and continued to grow poorer. But those poor pioneers were the cause of the railroad that came up from Newport through Batesville and was extended to Cushman in 1886.

Manganese ore drew much interest. The first mining on record was done a few years before the Civil War by Col. Mat Martin of Tennessee. These mines were located at Penter's Bluff, a mountainous district a few miles from Cushman. Since there was no other convenient way of transporting this ore out from the Bluff, it was loaded into barrels, placed on boats, and hauled down the river.

Among the early settlers were three distinguished men who brought most of the mining territory around Cushman. One of the places they bought was called Southern Hill and still bears that name. Other districts are Club House and Adelot.

Company Enters in 1883.

In 1883 the Keystone Manganese and Iron Company of Boston, Mass., mined Southern Hill. This company was the first to remove dirt by washing and was the first to

(Continued from Page 1)

reading system at West served as president of the Te Credit Union, is a member State Board, an officer in the Savings for Classroom Text and a member of Delta Gamma.

Program Numbers.

Numbers on the program

ship by rail from Cushman. In 1890 Skinner and Abbot of Chicago mined the Club House, which has proved to be a large producer. In 1896 Walter H. Denison started producing ore and since has continued.

In 1920 L. B. Miller of Cleveland, O., built a refinery on Polk Bayou. The ore, which was fine grains, was washed, heated and centered.

In 1928 Reed Denison observed that a substance miners were putting in waste piles was too heavy to be rock and would oxidize when in the air. He sent off samples, which turned out to be high grade carbonate.

The war seemed to set a spark to the small town, and it blazed with prosperity. Ore prices went sky high. Some of the best was sold for as much as \$85 a ton, but it usually ranged between \$25 to \$30.

After the war Cushman slowly began "dying" and gradually became smaller and business began to decline. But the townspeople of today are looking into the future in the hopes of once again seeing their little town take an upward trend.

Batesville Area May Be Site of Smelter.

Gazette 10-8-40

Kansas City, Mo., Oct. 7 (AP).—A group of mine owners, chemists, engineers and power men discussed today construction of a \$150,000 manganese ore smelter near Batesville, Ark., for processing southern Missouri and Arkansas ore. The smelter would be the first in this section of the country.

John Taussig, Kansas City civil engineer, was elected chairman of the group. He appointed two committees to study problems in establishing the plant.

Iron manganese, used as a hardener of steel, is an important defense need. Taussig said the R. F. C. encouraged holding the conference.

Discoveries Increase Manganese Reserves.

Gazette 10-14-40

Arkansas's manganese reserves have been almost doubled as a result of the accidental discovery several years ago of widespread deposits of carbonate manganese ores underlying oxide manganese deposits in the Batesville district, state Geologist George C. Branner reported yesterday.

A survey of the state's manganese resources released by Dr. Branner listed manganese reserves in the Batesville area of 322,000 long tons of high grade oxides containing 35 per cent or more metallic manganese. Smaller reserves are located in central Arkansas, he said.

Dr. Branner said the survey did not estimate the reserves of carbonate manganese. Heating is required to reduce it to oxide ore, he said.

He said the producers in the Batesville area had presumed the carbonate ores to be limestone until a test was made several years ago of ores unearthed in mining the oxide ores.

Location of Deposits.

The Batesville manganese district covers about 100 square miles in Independence, southeast Izard and northeast Stone counties. Scattered deposits are located in Pulaski, Saline, Garland, Hot Spring, Montgomery, Pike and Polk counties. The ores in the west central district, although higher in metallic content, are discontinuous and more expensive to mine, Dr. Branner said.

Manganese is on the War Department's list of strategic defense materials. It is used in the manufacture of steel and steel alloys, dry batteries and other products. Because the metallic content of Arkansas ore does not meet requirements established by the War Department, manganese produced in the state has not been purchased by the government for reserve.

New Manganese Process Said To Be Valuable.

Special to the Gazette. 10-15-40
Russellville, Oct. 14.—Arkansas will be able to supply large quantities of high-grade manganese through use of a new low-cost process which has just been patented by the Smith Mining Company, Russellville, for separation of phosphorus from manganese ore, Dr. R. L. Smith, president, said here today. He said the new process will open large supplies of ore which have not met requirements of the government due to a high phosphorus content.

Joe Meek, Russellville, mineralogist of the Smith company, and a consulting mineralogical chemist whose name was not revealed, are said to have worked out the process.

MODEL OF NEW PLANT FOR DEPHOSPHORIZING MANGANESE PLANNED

Special to the Gazette. 11-3-40
Russellville, Nov. 2.—The Smith Mining Company, which recently devised a new process for removing phosphorus from manganese ores, is building a model plant here to further test the process, on which a patent has been applied for, Dr. R. L. Smith, Russellville, president of the company, announced.

A consulting chemist, an authority on metallurgical chemistry, will be brought here as soon as the plant is ready to be assembled, Dr. Smith said. While the identity of the chemist was not revealed, Dr. Smith said he had been in part-time employ of the mining company here for three years and will become a full-time employee.

The Smith process, if proven successful, as laboratory experiments have indicated, will solve a problem that long has puzzled the steel industry. By providing a low cost, chemical process for eliminating phosphorus from manganese ore, it would open up unlimited store of the ore, so vital in steel manufacturing and in national defense, officials of the company said.

No satisfactory plan of eliminating phosphorus from manganese ore has been found, and the manganese with phosphorus content is unsuitable for steel manufacture because it makes the finished product too brittle for practical use. The Smith process is designed not only to remove the phosphorus, but to save it as a valuable by-product, and at the same time greatly improve the grade of the manganese extracted and purified.

The Smith company's application for patent is said to be the first filed for such process.

Phosphorous Makes Much Ore Unacceptable.

Although Arkansas has produced manganese for 50 years, the phosphorous content of the manganese ore in the state has made the ore unacceptable under government requirements. Likewise, practically all manganese ore in the nation, with the exception of Virginia, has failed to meet specifications, and, so far, the nation has had to depend on foreign countries for this No. 1 metal for the making of armaments.

In the same building the company plans to operate a model ferro-manganese plant, featuring a miniature electric furnace which produces 86 per cent ferro-manganese. Ore for this process will be taken from the company's mine at Crystal Springs, near Hot Springs.

Russellville is situated ideally for the operation of war industries—especially ferro-manganese plants, Dr. Smith said. Pointing out that power is the prerequisite, he said the location of such plants here would place them near extensive coal supplies, as well as natural gas.



DR. R. L. SMITH.

6,300 Tons Of Manganese Shipped

11-10-40

Special to the Gazette.

Cushman, Nov. 9.—Shipments of manganese ore from the Batesville-Cushman field for the first 10 months this year total approximately 6,300 tons. The total probably will run around 8,000 tons by the end of the year.

The Walter H. Denison Manganese and Contracting Co., and the Arkansas Manganese Co., have been the largest shippers. The former company shipped 520 tons in October, 430 tons of which was high grade, and 80 low grade. The latter was carbonate, and went to the Electro Manganese Co., of Knoxville, Tenn., which now is recovering pure manganese metal from this ore by the electrolytic process. The Arkansas Manganese Mining Co. also has one car of ore awaiting shipment on the ore yards here.

State's Production Second to Montana's.

Arkansas now stands second in manganese shipments in the manganese producing states of the nation. Montana leads. It seems evident that the steel industry and the government regard domestic deposits as reserves, as an immense tonnage of ore is being imported. Imports for June were 78,000 tons, July 110,000 tons, and August 280,000 tons. The bulk of import ore is coming from the Gold Coast, Cuba and Russia.

Investigations now being made of the carbonate ore deposits in the field by the Bureau of Mines, under the direction of W. F. Jahn, promises to increase materially the estimate of the reserves of this class ore. He has a large staff of men now at work on the Ozark property in the east part of the field, and another on the Martin tract, in Hankins Hollow, in the west part of the field. This work consists of trenching and tunneling.

Narrow trenches or open cuts are driven into the side of the mountain at intervals until they reach the carbonate ledge, proving that it underlies the overburden. A tunnel then is driven clear through the hill on the vein to prove that it is continuous. Measurements are made of the vein and samples taken as the work progresses. From these accurate figures can be drawn of both the quantity of ore and the average metallic content. This work is the most valuable work of an experimental nature ever done in the field.

The work done by the Bureau of Mines and local operators practically prove that the carbonate veins run clear through the mountains, and that many of the mountains that show no outcrops are very rich in carbonate ore.

Concerning these continuous carbonate deposits Reed Denison said: "The old theory, before carbonate ore was discovered, was that the ore lay only around the rims of the mountains and in the valleys, in pockets. Operations during the last few years show that these deposits penetrate and go clear through the mountains, and that the most valuable deposits are the undisturbed deposits

its way back underground. I have seen several tunnels started in barren ground on the side of a mountain and cut in 100 feet before they contacted ore. From there on into the mountain the vein was continuous. In some places, where the over burden has been broken enough for water to penetrate, the carbonate has been changed from a carbonate into an oxide, which is more valuable."

Not only will the Bureau of Mines investigate the carbonate deposits of this territory, but it also will experiment with dressing and refining the ore. A plant is now under construction at Rolla Mo., and arrangements are being made to ship 60 tons of miscellaneous ore from this field to this plant for experimental purposes. All of this work will be valuable to the future development of this field

Pure Manganese Now Recovered.

Results obtained at the Electro Manganese Co.'s electrolytic plant at Knoxville, Tenn., have proven that pure manganese metal can be recovered from manganese ore by the electrolytic process. Pure manganese metal is really a new metal to the steel and metal trade. It had been produced only in small quantities until the electrolytic process was put into operations about two years ago. Manganese metal produced by this process runs 99.96 per cent pure. It is worth approximately \$700 a ton and because of the small production and high price, most of it that is being produced now is used for experimental purposes. Most of these experiments are being made on new alloys.

Before this process was put in operation, the principal metal produced from manganese ore was ferro-manganese. This metal is recovered from the ore by a heat smelting process. There are two grades Standard runs around 80 per cent manganese, nine per cent carbon and 10 per cent iron. Low carbon grade runs 85 per cent manganese, three per cent carbon, the rest iron. The standard grade now sells for approximately \$125 a ton, and the low carbon grade around \$250.

From information at hand, Reed Denison believes that an electrolytic plant will be established in this field within two years, either by the government or by private capital.

MANGANESE ORE IN NEWTON COUNTY TO BE TESTED FULLY

Special to the Gazette. 11-24-40
Harrison, Nov. 23.—Although findings by geologists have not been made public, the North Arkansas zinc and lead mining area possibly will offer extensive developments of manganese ore.

Prospecting of the new field is under way by miners and property holders. Many leases have been obtained in the area and the entire area is being prospected.

Located Near Ponca.

The new developments are near Ponca in Newton county and are reached by traveling west from Harrison on Highway 43 until a mile east of Ponca, where a country road leads off to the west. The new field lies almost in a direct line between Ponca and Kingston in Madison county. Miners prospecting the area believe that the deposits also are found on a line between Ponca and Jasper.

W. O. Krueger, who recently came here from Atlanta, Ga., is developing the largest area west of Ponca. He has bought and leased several hundred acres and for the past two months has been working 20 men. An additional shift was placed at work this week to expedite development of the field. Mr. Krueger was interested in the Confederate and other mines in North Arkansas several years ago.

Manganese is a vital mineral badly needed in the national defense program, and these manganese mines will be worked at full capacity.

First Shunted Aside When Found.

John O. Wilson, former operator of the big lime plant between Pindall and St. Joe on the Missouri and Arkansas railway, developed some lead mines in the Ponca-Kingston area a few years ago, and said that many of the miners encountered veins of manganese ore in lesser quantities, but they were not interested in prospecting the ore, since they were working

for other metals.

Large deposits of a clay in brilliantly colored strata were uncovered at that time, Mr. Wilson said, which chemists said would be useful in the manufacture of paint. For years natives of the section used the clay for a medicine, finding it an excellent cathartic, he said. Mr. Wilson believes the Ponca-Kingston field will prove to be rich with the manganese and clay deposits.

Harrison May Become Center For Manganese

Democrat 11-24-40
Harrison—The next big news to break in this mining area may not concern zinc or lead, but may tell of the uncovering of manganese deposits greater in extent and richer than the Cushman field, according to geologists who have not yet made their findings public and also upon the authority of those who have bought land and secured leases in the newly discovered area and are developing their properties.

The new developments of manganese ore are reached by traveling west from Harrison on Highway 43 until a mile east of Ponca in Newton county, where a country road leads off to the west. The new field lies in almost a direct line between Ponca and Kingston in Madison county. Miners prospecting east of Ponca state their belief that the deposits also are found on a line between Ponca and Jasper.

The largest developments in area west of Ponca are being made by W. O. Krueger, who several years ago was interested in the Confederate and other mines in north Arkansas. He has bought and leased several hundred acres and for the past two months has had a force of 20 men working there.

Last week he put on an additional shift for the purpose of hastening development of the field. Manganese is one of the minerals badly needed in the defense program and these manganese mines will be worked at full capacity.

Others are entering the field and the promise is that this will soon be the scene of the greatest activity in the whole northwest Arkansas mining area.

John O. Wilson, who formerly operated a big lime plant between Pindall and St. Joe on the M. & A. Railway, undertook the development of lead mines in the Ponca-Kingston area a few years ago. He states his miners encountered the veins of manganese ore in lesser quantities but paid no attention to them as they were working for other metals.

Pike County Manganese Mine in Remote Ouachita Hills to Furnish Tons of Ore for U. S. Defense

12-1-40
By JOHN SCUDDER
(Democrat Staff Writer)

Murfreesboro—So far at the wrong end of a Pike county mountain road that even an enemy saboteur would hesitate to cross without tank facilities, Arkansas and the North American Manganese Corporation are becoming prepared to handle a major defense need—a potential daily output of 200 tons of manganese ore for the next three years.

In these remote Ouachita hills, the North American concern has spent the last year in building a road and moving in equipment, and only yesterday revealed the mining facilities there, and announced the production plans.

For several weeks it was known there was to be a manganese ore milling point at Glenwood, in Montgomery county, and yesterday J. Stacy Henderson, St. Louis, Mo., general manager of the North American group, announced its construction would be started December 15. Its purpose is to handle the expected 150-ton daily output of the mine, and another 50 tons daily which Montgomery and Pike county farmers are expected to bring in from their strip mines—in operation in the west-central Arkansas manganese district since World war days.

Have Government Contract.

The government contract, calling for delivery of 300,000 tons of the steel-strengthening ore in three years, is providing for the construction

tion of the plant, which ordinarily could not be afforded under peacetime manganese ore prices. The contract, already approved but awaiting final granting expected this week-end, also provides for an additional year for plant construction and production hindrances such as weather damage to the plant.

While the mine has produced some ore, its full facilities won't be running until late this week, at which time Mr. Henderson says it will go into full-time production—with ore being stocked at the mine until the mill is completed about February 15.

According to engineers' reports—including that of Dr. H. D. Miser, Washington, D. C., chief engineer of the United States Bureau of Mines—the mountainside on which the mine is located is a virtual solid deposit of ore, bearing more than 50 per cent manganese on the average.

Three or more hundred feet back into the mountain, with more than a block and a half of mountain overhead, a Democrat writer and cameraman yesterday saw (from a layman's view) strains of almost pure manganese several feet thick. (A block of the ore about the size of a 50-pound chunk of ice weighs about 200 pounds, and a ton brings \$37.50).

The North American officials figure where they can bring the ore out of the mountain at a cost as low as 25 cents a ton. The only other cost will be in transferring it to Glenwood.

While important to defense needs—manganese having recently been classified as a "strategic defense necessity"—the mine and milling point at Glenwood should stabilize in future peace-time Arkansas manganese activities, dormant in the past.

Arkansas has always had unlimited quantities of manganese, as a recent report of the Arkansas geological survey shows, but the nation itself has furnished only 10 per cent of its manganese. This is probably due to the fact that the metal-strengthening ore is mined cheaper in Russia, and American merchantmen find it a heavy, good and even profitable ballast on return Atlantic voyages.

Planning for Future.
Today, the nation has 1,000,000 tons of manganese ore on hand and American ore is to be layed away in "stock piles" for future use.

The North American group is hesitant in expressing the belief Pike, Montgomery, Garland and Howard county farmers can furnish 50 tons of ore daily for the Glenwood mill. However, farmers of this section have been selling small quantities of the ore in off-crop seasons for many years.

During the first World war these residents began strip-mining in the area. Small "pockets" of the ore are found plentiful over the entire section, but they were never in enough quantity to warrant organized mining.

The idea of a "mother vein" existing was first thought of by Mr. Henderson's father, J. E. Henderson, now in charge of the mine site, and Dr. J. Carson Adkerson, Washington, D. C., president of the American Manganese Producers' Association, a co-operative group composed of manganese mine owners.

Found Source of Ore.
It was Dr. Adkerson's view that the "pockets" of the ore could not exist over such a scattered area without there being a source probably scattered by volcanic eruption centuries ago while in its molten stage. Mr. Henderson discovered what is believed to be that "mother vein" three years ago.

Both Dr. Adkerson and Mr. Miser inspected the site in October. They and the elder Mr. Henderson, a veteran prospector and oil man, believe the veins become wider the deeper they go.

Cheapness in mining the ore—previously an expensive procedure in Arkansas—is being reached through an ore, but infrequently used, mining method.

North American has run a seven-by-eight-foot shaft more than 400 feet back into the mountain side. Locating the veins on top of the mountain, they are following the veins down to the core of the mountain and the main shaft, with slanting, "drift" shafts.

A dynamite charge imbedded in a vein in one of the drift shafts is exploded and sends tons of ore down the drift into the main shaft, into waiting dump cars which transfer it out of the mine.

That method should remove the ore at not much more than 25 cents per ton, experts believe.

Three Shifts Working.

Currently, three shifts of 14 men are working 21 hours daily at the mine. At capacity, 100 men will be regularly employed at the mine, while another 50 will be employed at the mill at Glenwood. Purchase of ore from residents of the area should provide jobs for still another 150 men, Mr. Henderson believes.

The mill will include crushers, conveyors, jig tables (for separating the ore from the crushed rock), and flotation process facilities (for separating ore from rock when the jig table method fails).

The younger Mr. Henderson said the Glenwood mill had not been constructed to date because the corporation had been awaiting an ore test

conducted by the U. S. Bureau of Mines. The federal tests, he said, took 60 days to complete and resulted in estimates of an average of 63 per cent ore content, but more important to the state proved that low-content ore could be separated from Arkansas novaculite rock.

It was necessary to await the results of this test, announced about a month ago, before specifications for the mill were drawn.

Own Other Rights.

The corporation also owns mineral rights to another large deposit of the ore which has been humorously named the "Cogburn Mine." It is located in Montgomery county.

Young Mr. Henderson explained that this area was located in the Cogburn community, the land being leased from various members of the Cogburn family.

"The family is very clannish," Mr. Henderson said, and added that "our lease reads that no one but a Cogburn must work there. The mine manager is a Cogburn, so are the workmen, the miners and even the nightwatchman. So we named it the Cogburn mine," he added.

Tests of this mine have proven the ore to be fairly high grade, but not in near as great a quantities as the main mine. Activities will be confined mostly to "strip-mining," he said.

While the main use of manganese ore is in the manufacture of ferro-manganese for steel-making, it is also used in the manufacture of batteries, paints, bricks and fertilizer. In steel-making, a minimum of 14 pounds of ferromanganese is used to a ton of steel.

Approximately 40 per cent of the ore used in the United States is imported from Russia; the remaining 50 per cent used over here being imported from South Africa, Norway, Brazil and Cuba, none of which are now considered indefinitely sure import prospects.

The railroads, the highways and the rivers—these are factors in the construction of the proposed manganese ore processing plant at Helena, as they have been factors in other developments. And they hold possibilities for the future.

It seems a natural and practical plan to ship Arkansas manganese ore, as by the Missouri and Arkansas and the Missouri Pacific railroads, to a river port. Oil products are brought by Mississippi river barges to Grand Lake, Ark., for distribution by land transportation facilities, and oil was once piped to that terminal from an Arkansas field for transportation by river barges. Cotton was formerly shipped to De Valls Bluff and carried down the White river for transportation to distant points.

Industry in Helena heretofore has been mainly represented by lumber and woodworking mills. A metallurgical plant would not only be a branching out into a new field of industry for Helena itself, but should work to the advantage of the manganese producing areas of North Arkansas.

It might be said that Baton Rouge was made industrially by its location on the Mississippi river. Until its special advantages as a processing and shipping center for petroleum products were recognized, the Louisiana capital had been a comparatively small town, its life revolving around the state university, the offices of the state government and the periodical sessions of the legislature. Now Baton Rouge has not only its great oil refineries but a number of other important industries which have been brought by its strategic situation on the lower Mississippi.

Says Helena's Electric Rate Got Plant

Special to the Gazette. 3-1-41
Batesville, Feb. 28.—A letter received by the Batesville Guard today from Congressman Wilbur D. Mills quoted Arthur Lorch, promoter who proposes to build a \$4,000,000 plant at Helena to process Independence county manganese ore, as saying that the determining factor in his selection of Helena was that he could not obtain electric power cheaply enough here.

"Mr. Lorch informs me that the Helena plant will cover an area of five miles, that his concern has not sold its entire output to the government, that the plant shall have two buildings for its main establishment in addition to warehouses," Mr. Mills wrote. "He informs me that his new company will use Arkansas labor and technical aides as far as possible, that Arkansas construction materials and equipment will be given preference."

Mills Favored Batesville.
"I have just conveyed to Mr. Lorch my disappointment over the decision that he and his associates have made to locate the plant at Helena instead of at Batesville, where the plant should be located, due to the availability of the necessary ores. He contends that he is making the best location possible from his viewpoint, since the proposed plant will require electricity, which he says he cannot obtain in Batesville in the quantity desired and at rates he is willing to pay. He states that he can obtain this electricity in quantities desired and at the rates he desires in Helena."

"The establishment of the privately owned beneficiating plant at Helena will foreclose any possibility of obtaining a government-financed plant for the concentration of manganese at any other point in Arkansas at this time."

However, belief continued here that the plant is far from reality.

"This industry will be operated by residents of Arkansas," the legislators said. They said the contract was the first large defense contract "given to an Arkansas concern."

They said the plant would have a \$2,100 weekly pay roll, exclusive of salaries of executives, salesmen, and office employees.

Gathings and Senator Caraway called on President Roosevelt a few weeks ago with Arthur Lorch, organizer of the Arkansas company and its technical adviser, with their proposal to process low-grade Arkansas ore at Helena.

Section to Benefit.
"My district, as well as others in the state, will benefit by the purchases made for the plant, some of the most important of which are cement, building supplies, electrical equipment, coal, and lumber," Gathings said.

"The Missouri & Arkansas and the Missouri Pacific railroads and truck lines will be used to transport the ore from Independence county to the plant at Helena."

Site for Manganese Plant At Helena Not Determined.

Special to the Gazette.
Helena, Feb. 26.—Persons interested in the manganese ore processing plant to be located in Helena said today that they had no information as to the site of the plant or when construction would begin. It was believed that possibly the contract for construction had not been signed, but may be signed in Washington tomorrow.

Sam Ciener, Helena business man and relative of Arthur Lorch, New York mining engineer, reported to be the organizer of the Manganese Co-operative Producers Association of Helena, and technical adviser for the firm, said he did not know whether Mr. Lorch would be active in the management of the plant, nor who would be connected with it.

When the proposed plant first was discussed several months ago, local interests were informed that the plant would cost approximately \$1,000,000 and would employ about 135 persons, with a daily pay roll of approximately \$682. In addition to those employed here, it was said that establishment of the plant would result in employment of several thousand miners in the Batesville area.

Helena's river and rail facilities were believed to have played a large part in the selection of this city as the site for the plant.

Skeptical About Helena Plant Plan

Special to the Gazette. 2-28-41
Batesville, Feb. 27.—Persons familiar with mining and marketing manganese in the Batesville-Cushman field said today they had little faith in the proposal to construct a \$4,000,000 plant at Helena to process 100,000 tons of Independence county manganese which the government, through a subsidiary of the R. F. C. has agreed to purchase.

A Cushman field operator pointed out the best ore that can be produced in the Cushman field runs only from 35 to 40 per cent manganese, which means two to three tons of crude ore would have to be shipped from this county for processing at Helena for every ton of concentrates (40 per cent) which the Helena promoters would sell to the government.

Because of high freight rates on ore from Batesville to Helena, and the fact that all base metals are mined on a close margin of profit, operators here believe such a proposal impossible, even at a substantial guaranteed market price from the R. F. C.'s Metals Reserve Corporation.

Great Waste Feared.
An authority on the geology of this area said purchase of 100,000 tons of the higher grade ore would mean the digging and virtual wasting of 10 more tons of lower content ore for every one marketed. Marketing of that much of a specific grade would deplete the field and waste the manganese resources, he said.

Leaders here pointed out that the proposed Helena plant has until December, 1944, to fill its order, and asserted that by that time Norfolk dam will be completed, and the government will be in better position to sponsor such a project in this area than in Helena.

Home group elections were concluded last week at Pulaski Heights Junior High School for the spring term. Results in 9A are announced as follows:

9A1, sponsored by Mrs. Zora Atkinson; president, Rose Marie Glover; vice president, Kathryn

Special to the Gazette. 2-9-41
Cushman, Feb. 8.—A tour of Western manganese fields has convinced Reed Denison of the Walter H. Denison Manganese and Contracting Corporation here that Arkansas's manganese field is the best in the United States.

Following receipt of innumerable letters from owners and operators of Western manganese properties, Mr. Denison made a 5,000-mile tour of Western states, devoting most of his time to the manganese fields in the Patagonia district near Tucson, Ari., and around Deming, N. M.

He said the western ore was harder and therefore more difficult to beneficiate. He said lack of a beneficiating process to raise the ore from low grade to the prevailing market minimum of 40 per cent metallic content was the chief obstacle encountered there, as in Arkansas.

"They are confronted with the same deplorable situation as we are in the Cushman field," he reported. "They have no market for low grade ores and they have practically no high grade. Neither have they worked out a successful beneficiating plan. One plant in New Mexico, by a grinding and washing process had brought ore that ran around 28 per cent up to 45, but it was not in operation when I was there. They operated on hard oxide ore."

"We have more ore in the Cushman field than they have in any place I visited. All of their ore out there is hard ore, which will be much harder to beneficiate than our low grades, most of which are soft."

Weather Retards Production.
While the demand for high grade manganese ore is firm, production in the Arkansas fields was retarded by wet weather during January. The bulk of the ore shipped from Arkansas was produced by the Walter H. Denison firm and the Arkansas Manganese Company.

The price of ore has not changed, and there has not been a market for less than 40 per cent ore. Possibility of a raise in domestic ore price is seen in the leveling off of imports from Russia, caused by the war in the Mediterranean. Steel mills already are consuming about the amount of the imports.

Reporting his firm's production in January was small, J. H. Gibbons of the Arkansas Manganese Company reiterated the need of the field for a beneficiating plant. The electrolytic process seems the best, he said.

Good Ore Strike Reported.
The best ore strike since January 1 was made on the George tract west of Cushman. Owned by Tom Shell, it is under lease to the Denison firm and is being operated by Tillman Hurley and Richard Johnson. They have cut into six feet of exceptionally high grade ore and haven't gone through it. The vein was struck in a shaft at 54 feet.

Big Defense Contract For Arkansas

Gazette 2-27-41
Washington, Feb. 26 (P).—Senator Caraway (Dem., Ark.) and Representative Gathings (Dem., Ark.) announced today the Metals Reserve Corporation, R. F. C. subsidiary, had accepted a proposal of the Manganese Co-operative Producers Association Company, of Helena, Ark., to supply 100,000 tons of grade A manganese for defense use at a contract price of \$4,611,000.

The ore would be processed at Helena, and the contract called for delivery to the government at that city before December 31, 1944. The Arkansas company will begin at once construction of a plant to cover five acres. It will involve two buildings, one of structural steel, the other of wood.



—Democrat Photo.
Murfreesboro—From this mountainside, located deep in the Ouachita range, the North American Manganese Corporation plans to bring out thousands of tons of manganese ore for national defense purposes. In the top left picture a worker is shown riding out on a car of the ore. He is just emerging from a shaft, dynamited more than 350 feet straight back through the rock mountainside. Another shaft, and other planned shafts originating from the top of the mountain, will empty into the main shaft. There the cars will pick up the ore and bring it to the surface. In the top right picture a mine worker is displaying huge chunks of the ore, which is piled around the mine, stored there since its removal from the mountain as the shafts were being dug. In the bottom photo workers are pointing to a foot vein of the ore with their picks. (The ore is not broken out with picks, but dynamited out.)

Ore in Newton County Spurs Mine Activity

Special to the Gazette. 12-8-40
Harrison, Dec. 7.—Mining prospects in Newton county have created much enthusiasm among the residents. Several tracts have been sold, while mineral leases have been taken on other tracts for development of mineral possibilities. W. J. Grogan and O. H. Newberry of George, in the extreme northwest corner of the county, reported here.

Three eight-hour shifts are being used in opening a shaft and tunnel in the recently discovered manganese mines of W. O. Krueger in the George area, Mr. Grogan said. Other miners are developing manganese deposits in the area lying between Ponca in Newton county and Kingston in Madison, he said.

Extension of the Carroll County Co-operative REA line is being made from Ponca to George and the line will be installed within a mile of the newly opened mine, to which an extension will be made, Mr. Grogan said.

Large deposits of what now is recognized as manganese ore has been uncovered in that area in past year, Mr. Grogan says, and that the ore has been found in old drift which was worked for lead and that a new tunnel is being opened uncovering a large deposit.

Pick and shovel miners have been taking out large quantities of free lead and zinc ore at the Confederate mine near Cave Creek in

Newton county, James Salmon, steam shovel operator, said this week. The mine is one of the J. C. Shepherd mines. The steam shovel has been inoperative for a few days pending arrival of some replacement parts.

As the result of the WPA mineral survey of Searcy county, a large deposit of lime and phosphate has been located just north of Gilbert on both sides of the Missouri and Arkansas railway tracks. John O. Wilson, who formerly operated large lime plants at Monroe and Bastrop, La., and St. Joe, Ark., has examined the ledges there and is said to be planning to develop a lime and fertilizer plant.

500 Tons Of Manganese Last Month

Special to the Gazette. 12-8-40
Cushman, Dec. 7.—The demand for manganese ore is slightly stronger now than in former months, and approximately 500 tons was shipped from the Batesville-Cushman field during November. A slightly larger tonnage is anticipated for December. Some furnaces now are taking a small tonnage of ore that runs less than 40 per cent. This is mixed with higher grades, giving the whole a balance of 40 per cent or better.

The Walter H. Denison Manganese Corporation is doing some new prospecting and opening up some new ore deposits. On mountains that show outcrops on the sides they are now sinking prospect shafts from the top. If ore is encountered in the shaft, they start mining with tunnels from the sides. The shaft proves up the deposit.

Ore Lies In Wash Pans.

More mining is now being done with tunnels deep underneath the hills than in the past. Until a few years ago, most of the ore produced in the field was produced from pockets on the sides of the hills, in open clay ground. It has been determined in recent months that the blanket veins of manganese in relation to the mountains are much like a wash pan. The main deposit is in the body of the pan as water would be. The pockets on the sides of the hills can be compared to the slosh or overflow from the pan. Driving into the mountain close to the rim of the pan, operators find that the veins thin out. On past the rim, they thicken up and run clear through the hill to the other side of the rim of the pan.

Work done by the Bureau of Mines, assisted by members of the United States Geological Survey, has been valuable in determining the way these ore bodies lie and their extent. Until this week this work has been under the direction of W. F. Jahn. He has been transferred and Alvin M. Cummins is now in charge. Much work is being done on the carbonate deposits in the western part of the field and work in this section will be expanded.

Beneficiating Plans Studied.
For the last month they have been collecting large samples of the different ores to send to Rolla, Mo., for experimental purposes. These samples consist of wad ore, black rock and carbonates. All will be subjected to beneficiating experiments. Different methods of ore dressing will be applied to them to work out some plan to change them from the low grade class into the high grade class. These samples come from all parts of the field. Some have been taken from Stone county on the south side of White river.

Gazette 3-2-41 Says Manganese Treating Plant At Helena Would Be Wasteful.

To the Editor of the Gazette:
Should a plant be built in Helena for treating manganese ores from the Batesville area it would mean the waste of perhaps 50 per cent of the reserve tonnage of the Arkansas field. It has been lately shown that the heavy tonnage of manganese in the Batesville field consists of manganese carbonate, extending over practically the entire area of some 100 square miles and running in thickness from a few inches to 20 feet. This carbonate runs from five to 35 per cent in pure manganese.

All base metals are mined on a close margin of profit and volume alone with ability to handle cheaply extremely low grade ores determines success or failure of an operation.

The Batesville carbonates run in quality from five to 35 per cent and it is safe to state that for every ton of ore running from 30 to 35 per cent there are 1,000 tons running from 25 to 30 per cent and for every ton running from 25 to 30 per cent there are another 1,000 tons running from 20 to 25 per cent. Also for every ton running from 20 to 25 per cent there are 1,000 tons running from 10 to 20 per cent. The lower the mineral content of the rock the greater the volume.

On account of the close margin of profit with which these as well as all base metal ores, must be treated if ever an attractive and profitable operation is developed, river freight from Batesville to Helena alone, to say nothing of extra handling costs would render at least 50 per cent of the Arkansas manganese deposit impossible to handle except at a loss. It would be a losing proposition to ship a good 50 per cent of the rock that in many cases it would be necessary to mine in order to obtain the rock of sufficiently high grade worthy of shipment.

A successful development of Arkansas manganese will require the handling the extremely low grade ore at low cost and a plant anywhere other than right here in the mineralized area would not improve local or national conditions.

Batesville, Ark. W. G. Rinehart.

Helena Plant Details Due This Week

Special to the Gazette. 3-9-41

Helena, March 8.—Despite crepe-laden stories emanating from Batesville concerning the proposed location of a manganese ore processing plant at Helena, residents here interested in the construction of such an enterprise have no doubt the plant will be built.

They feel confident that when Arthur Lorch, mining engineer of New York, who promoted the location of the plant here, returns to Helena he will have word concerning the details of when and how the plant is to be built.

Mr. Lorch was to have come here this week-end, but was detained in Washington, and probably will come here next week. Sam Ciener, Helena merchant, who is a relative of Mr. Lorch and who probably has done more than any other Helena citizen to obtain the plant, said that he understood Mr. Lorch was arranging the financing of the plant before coming here.

One citizen, who said he did not care to enter into an argument with Batesville citizens concerning the location of the plant, said that he attributed the selection of Helena "to the fact that Helena kept working for the plant while Batesville was idle on the job."

Mr. Ciener said he visited the Independence county area with Mr. Lorch.

Leaders here denied that Helena was trying to "shadow box" in an effort to obtain extension of TVA lines here or that TVA power has been promised in the event such a plant is located here, as has been suggested by a Batesville news article.

No Cushman Manganese Contracted

Special to the Gazette. 3-9-41

Cushman, March 8. — Asserting that no contracts for purchase of

manganese from the Cushman field have been discussed, several operators in the field expressed doubt today that the manganese processing plant proposed at Helena ever will be built.

"No contracts have been let for ore in this (the Cushman) field to supply this plant, and no one has even approached any of the producers up here asking for a contract," J. H. Gibbon, head of the Arkansas Manganese Company, which operates mines on the Aydelott property near here, reported.

When the Metal Reserve Corporation, an R.F.C. subsidiary, announced it had accepted a proposal of the Manganese Co-operative Producers Association of Helena to buy 100,000 tons of Grade A manganese for \$4,611,000, it quoted Arthur Lorch, organizer of the corporation, as saying he planned to obtain his ore from the Cushman field.

The Cushman field is the only domestic field that could supply the proposed plant at this time. The closest other field is in Cuba, Mr. Gibbon said.

While the demand for manganese ore is strong, the price has not advanced materially, and the Cushman field is making about the same production as it did in the first months in 1940. The Walter H. Denison Manganese and Contracting Company shipped 575 tons of high grade and 133 tons of carbonate during January and February. Lou Peterson, who operates the Folk Southard and Turner mines, and the Arkansas Manganese Company, operating the Aydlotte, also have made shipments during the last few weeks.

The price of ore seems to be held down by government specifications, operators reported. If the government would reduce the phosphorus content in its specifications one-fifth of one per cent, ores from the Cushman field would come within them. This reduction would give them a better price for the ore, and this amount of phosphorus has no effect in the manufacture of steel, operators contend.

The Arkansas Manganese Company now has samples in the hands of 10 chemical concerns and chemists to work out some practical beneficiation process for wad ore, of which it has an enormous tonnage.

New Market Looms.

During the last few days one company has agreed to take ore as low as 37 per cent, and one car has been shipped. If that firm can handle this successfully and will continue to buy this grade, the production of the field can be increased. Every point down below 40 means a larger production.

Cason Mine Leased.

The Walter H. Denison Company leased the Cason mine, three miles northeast of Batesville, this week and will start operations on the property soon. This mine has not been in operation for several years. In the old days when the furnaces took the lower grades, the Cason produced thousands of tons. It was one of the largest producers in the field during the World war. Both carbonate and oxide ores are present on the property, the oxide vein overlying carbonate. The oxide ore is in the shape of buttons and has the name of "button" ore. These buttons lie imbedded thickly in a shale. In order to produce a better grade ore, the buttons have to be recovered from the shale.

"We will start soon to make hand jig tests of this ore, and if they show that it can be washed and concentrated successfully, we probably will install a larger power plant," Reed Denison reported.

Testing of the lower grade ore bodies in the field by the Bureau of Mines is still in progress. It still is sinking test shafts in the Cave Creek sector on the Bill Jim, Hunt Hollow and Will Chinn properties.

Explains Selection of Helena As Manganese Plant Site.

Special to the Gazette. 3-11-41

Helena, March 10.—River-rail facilities here and availability of artificial gas that would be needed in the processing of ore largely were responsible for selection of Helena as the site for a manganese plant, Congressman E. C. Gathings said in a letter received by Jack M. Young, editor of the Helena World, today. Mr. Gathings said there was considerable misapprehension at Batesville concerning the reasons for selecting Helena.

"Helena is the only city that has the proper gas that would be needed in the procession of ore," the letter said. "Helena is the only city in Arkansas that has river-rail facilities. Freight rates would favor Helena over Batesville."

Strike Of Pyrolusite Promising

Special to the Gazette. 4-6-41

Cushman, April 5. — The strike made on the George tract last month, which showed a 30-foot run of fine manganese ore, may turn out to be a real find. The ore carries some pyrolusite, a variety of manganese ore used for batteries and chemical purposes and brings a much higher price than the ordinary grades. Assays are being made to determine the amount of pyrolusite. This ore was struck in a shaft at a depth of 54 feet. The property is owned by Tom Shell and is under lease to the Walter H. Denison Contracting and Manganese Company.

Shipments of high grade ore from the Batesville-Cushman field ran between 500 and 600 tons last month, and about the same production is anticipated for April. Furnaces still are demanding ore running 40 per cent and above.

Ore investigation work by the Bureau of Mines probably will last until July 1. Investigations on wad ore are being made on several properties on Cave creek. Several shafts are also being sunk on this class ore on the Aydlotte property near Cushman. Some work also is being done on carbonate ore on the Martin property in the western part of the field.

Gazette 4-23-41

Manganese Operator Visits.

Each ton of steel needs 14 pounds of manganese, "and there is no substitute," C. J. Colp, who has Polk county manganese interests, said here yesterday. Mr. Colp, an independent operator, said that he was in the Polk field in 1918 and returned two years ago. He visited the capitol after returning from Washington, D. C., and Pittsburgh, Pa. The United States imported 1,294,308 tons of ferro manganese last year and domestic shipments were only 40,000 tons, he said.

Manganese Near Guion Plays Pranks.

Special to the Gazette. 4-27-41

Guion, April 26.—Geology in north Arkansas sometimes plays pranks with geologists, and an example of this is a large body of low-grade manganese carbonate that lies across the White river from Guion in Stone county. All of the manganese in this section lies between the St. Clair and Ferndale marbles. This deposit lies in the St. Joe formation above the St. Clair, and is a puzzler.

The property on which the deposit is located consists of 160 acres now owned by W. F. Wolford and operated by the St. Clair Marble Co., which operates a marble quarry five miles below Guion. He bought the property for its marble values. Later he discovered the manganese. The vein runs from four to 12 feet thick, and assays show an average metallic content of eight per cent, which is very low. The vein also runs onto other adjoining land. It is too low in metallic value to be marketable now, but offers a tremendous amount of raw material for processing if a beneficiating method could be worked out to handle it. Three tons have been shipped to Rolla, Mo., for experimental work.

In this particular place four metallic and non-metallic veins of mineral lie bedded together. The low grade manganese is on top, the St. Clair marble is just below, then another run of manganese carbonate, and under that the Ferndale marble. The entire deposit occurs in a bluff that rises perpendicularly from the south bank of White river.

First Cushman Field Mine Electrified

Special to the Gazette. 5-11-41

Cushman, May 10.—Electric hoists have been installed by Reid Denison on the Southern Hill manganese mine. This is the first time electricity has been employed in mining operations in the Cushman field, and it works well.

Four hoists are being driven with

current. Two of them are gear type hoists and the other two are friction type. The friction type was designed by Wilson White, a miner. Blowers also are driven by the same motors, which keep fresh air circulating in the shaft and under ground drifts.

60 Test Shafts Sunk.

There is no unemployment in the field, as many operations are under way, and 120 men are employed in sinking 60 shafts by which the Bureau of Mines in investigating the field's possibilities.

With the exception of one tunnel being driven on manganese carbonate on the Martin property in the western part of the field, all the work is being done on soft oxide or wad ores. Most of the work is being carried on where commercial mining has been done. In the western side of the field shafts are being sunk on the Aydelotte property. On the eastern side shafts are being sunk on the Hunt Hollow, Wild Cat (Adler), Big Jim and Chinn properties. All of the latter lie along Cave creek.

Investigations have disclosed that the big future of the field in low grade ores lies in the soft oxides or wad, of which there is an enormous reserve tonnage. The big drawback to the production of wad ore is that little of it runs as high as 40 per cent, it is extremely hard to wash, and it carries too much phosphorous. Washing to raise the grade makes the loss run over one-half. In washing three tons of wad ore of 32 per cent, to raise the grade, the operator loses two tons, and the ton he recovers runs only 37 per cent, or five per cent more than the batch he started with. Samples of this ore were shipped to Rolla, Mo., recently for experimental beneficiating tests, but no results have been released.

Michigan Engineer in Charge.

Alvin Cummins, who had been in charge of the work here for the Bureau of Mines for several months, has been transferred to Washington, D. C., and Max Tessmer, a mining engineer from Michigan, has been put in charge of operations. T. A. Hendricks, with the United States Geological Survey, is the geologist.

Operations on carbonate show much of this ore in the field, and most of it of 20 per cent or better up is adaptable to the electrolytic process of recovery. It is problematical, however, whether it could be depended on to furnish a supply for a large plant. It is erratic and 'pockety.' One shot may bring down high grade ore, and another shot following it in the same face may bring down very low grade.

Analysis of pyrolusite, found last month on the George tract owned by Tom Shell, showed that it was marketable ore running 87 per cent manganese dioxide. A complete analysis, however, would have to be made before it could be used for battery purposes, as other chemicals have their effect on this type ore. Most of the domestic ore of this type now comes from Phillipsburg, Mont. Even after complete analysis, any ore used for battery purposes is tried before it is used generally. Batteries are made up and let stand for a year as a final test.

Funds have been set up to carry on the Bureau of Mines investigation work in the field until July 1. If, however, the results of work already done justify, the work may be continued.

Hope Seen For Low Grade Manganese

Gazette 6-8-41

The possibility of utilizing Arkansas's vast reserves of low grade manganese ores, found mostly in the Cushman-Batesville area, was seen by George C. Branner, state geologist, in the development by a Knoxville (Tenn.) company of the electrolytic process of reducing the ore to metal.

The problem of utilizing low grade manganese ores has occupied the minds of metallurgists for many years. The Electro Manganese Corporation of Knoxville, has attempted to solve this problem by the electrolysis of a manganese containing solution, the manganese being obtained from low grade ores.

Mr. Branner visited the Knoxville plant last month and conferred with H. L. Chamberlain, manager, and William L. Hammerquist, research chemist.

Corbonate Substituted For Oxides.

The plant first used low grade oxide ores, but this did not prove entirely satisfactory because these ores had to be heat treated in the presence of producer gas and the chemical make-up of the resultant product, impure maganous oxide, was variable.

At the present time manganese carbonate ore from Chamberlain, S. D., is being used and this does not have to be heat treated. The chemical content of the product is less variable. Some Arkansas carbonate ore has been used and more or it may be used if the chemical requirements on limits of impurities can be met consistently, Mr. Branner said. It is important that the ore contain not more than 10 per cent calcium and one per cent magnesium.

Production Very Small Now.

The Knoxville plant is producing from 3,800 to 4,200 pounds of metal per day from 121-2 to 15 tons of carbonate. Six kilowatt hours of electrical energy is used to produce one pound of electro-manganese. The metal is plated on stainless steel cathodes at the rate of about 1-1,000 of an inch per hour.

The price of the metal is usually between 33 and 36 cents a pound and about 98 per cent of the output now is used in the manufacture of low-carbon stainless steel. The remainder is used in the manufacture of the non-ferrous alloys of aluminum, copper, zinc and magnesium.

Due to defense needs, the government is expected to restrict stainless steel production. This would enable the Knoxville firm to produce approximately 10 tons of metallic manganese daily from low grade ore for use in the manufacture of non-ferrous alloys.

Cost Must Be Reduced.

To make the electrolytic process adaptable for the bulk of the low grade ore production, the cost must be reduced further. Mr. Branner said the possibilities offered by this process are especially important to Arkansas because of the large reserves of manganese carbonate and the contemplated development of cheap power in the White river valley.

Manganese Field Gets Major 'Lift'

Special to the Gazette. 6-8-41

Cushman, June 7.—The major steel companies have lowered the restrictions on the mineral content of manganese ore five per cent and now will take ore running as low as 35 per cent. This will cause a large increase in production in the field. It is expected that by late autumn this will be one of the most active mining fields in the state.

The Arkansas Manganese Company, headed by J. H. Gibbons, which has not operated for several months because of mineral content restrictions, is in operation again. It is operating one large washer. It has rebuilt its office. Its operations are on the Aydelott property, a few miles from here.

Production Sets Record.

In May the field produced and shipped 479 tons of high grade ore, the largest monthly production made this year. March shipments were 464 tons, and for that month constituted 25 per cent of the high grade ore shipped in the United States. April shipments totaled 375 tons.

Reed Denison reported that the new electric hoists and blowers installed recently have increased production and he expects to install more soon. They not only lift the ore quicker but are easier to operate. The blowers, which supply fresh air to the underground drifts, have been a big help. They clean out powder smoke immediately after the shots, which allows the miners to break down more ore each shift.

"Before we put in the blowers on some days when the atmospheric pressure was heavy, the men could not stay under ground but a short time," Mr. Denison said. "Now the air is pure and they can work a whole shift without coming up."

The government still refuses to buy ore in the field because of the phosphorus content, which on an average is only 15 per cent above government specifications. By blending this ore with foreign ore which does not carry so much phosphorus, buyers could reduce the phosphorus content to within specifications, but they refuse to do it.

Freight Rates Discriminatory.

Another detriment to the field,

recently uncovered, is freight rates. The freight rate on foreign ore from New Orleans to Rockwood, Tenn., a distance of 800 miles, is \$2.62 a ton. From Cushing to Birmingham, not much more than half

that far, the rate is \$3.88 per ton, which operators class as "rank discrimination."

Albert A. Munisch, with the Safety Division of the Bureau of Mines, has been in the field several weeks carrying on accident prevention work. Two safety chapters have been organized, one at Cushman, with about 80 members, and another at Pfeiffer with about the same number. Reed Denison is president of the Cushman chapter and William Chinn of the Pfeiffer chapter. They meet once a month and discuss safety methods, some of which are being put into effect.

The highest grade ore ever found in the field was struck a few days ago by Dave Dunnigan, who has a lease on the Ozark No. 1. The ore runs 60 per cent and has the appearance of finished steel. Former miners had worked around the find for the last 20 years but never drove a pick into it. Mr. Dunnigan is guided in his search for ore largely by the color of the clay. He has been mining manganese for years and always has a good mine.

Manganese Process May Aid Arkansas

Gazette 6-10-41

A new electrolytic process for reducing low grade manganese ore for use in steel manufacture may lead to development of large deposits of the ore in Arkansas, Dr. George C. Branner, state geologist, told the Engineers Club at its luncheon at the Frederica hotel yesterday.

Dr. Branner, who recently visited a plant producing ferro-manganese on a small scale near Knoxville, Tenn., said the mineral is one of 10 strategic minerals in the country and probably ranks next in importance to tin among those largely imported into the United States. It is one of the essential elements in steel, forming 14 pounds to every ton of steel produced, he said.

Dr. Branner said the process used by the Knoxville plant produces the ferro-manganese at a cost of 33 to 36 cents a pound—a price too high to compete against the same product produced from high grade ore. The United States Bureau of Mines estimated the cost would have to be reduced to 15 cents a pound if large scale production is successful. Production of the Knoxville plant is being used in manufacture of a high grade of stainless steel.

Huge Reserves Of Low Grade Manganese.

The United States has reserves of only 4,350,000 tons of high grade manganese ore and uses 700,000 tons a year. Present supplies would last only four or five years, Dr. Branner said, and so the country is drawing largely upon sources from abroad.

As contrasted with high grade manganese, which is comparatively scarce, it is estimated there are more than 50,000,000 tons of low grade manganese ore under ground in the United States. Northern Arkansas has 250,000 tons of high grade manganese but several times that amount of low grade manganese, he said.

Dr. Branner said the Knoxville company, which has been using the low grade manganese for two years, uses the low power rates of the Tennessee Valley Authority and ability of Arkansas to use the same process would depend upon development of the vast power resources of the White river. Production at the Knoxville plant requires about six kilowatt hours per pound.

Big Purchase Of Manganese Made in State

Government Orders 300,000 Tons From Arkansas Producers.

Democrat 6-15-41

Receipt of a government defense contract for \$600,000 worth of manganese ore, and the location of a stock pile area for the U. S. pur-

chased ore at Gurdon, was announced yesterday by J. Stacy Henderson, general manager of the North American Manganese Corporation, Glenwood.

The defense contract calls delivery at the Gurdon stock pile of 15,000 tons, the first order on a tentative 300,000 ton contract of the ore, recently classed as a "strategic defense material." Mr. Henderson said he could not immediately announce the exact location of the stock pile at Gurdon. The area was selected because of its location on railroad lines, and proximity to the company's milling plant at Glenwood.

Government to Store Ore.

The ore will be stored at the stock pile 5,000 tons to the acre. Since the government now has on hand approximately 1,000,000 tons of manganese ore, the Arkansas supply will not be used immediately, but will be purchased and retained by the government until imports, the majority being from Russia, are cut off.

At the corporation's Glenwood milling point, ore will be handled from the North American mine near Murfreesboro and from a number of individual "strip" mines owned and operated by residents of the area.

The ore will be purchased outright from the farmers, who for many years have been mining manganese as a sideline. The milling plant is able to handle approximately 200 tons daily, and Mr. Henderson previously said the mine output would be 150 tons daily, and the remaining 50 tons would be purchased from the farmers. Also, ore will be obtained from the Batesville area.

Mine Opened Last Year.

The mine, located by Mr. Henderson's father, J. E. Henderson, has been in operation since December, and the mill has been completed for some time. The corporation employs approximately 100 persons at the mine, and another 50 at the Glenwood mill.

The federal contracts were obtained after inspections of the ore and tentative supply has been made by Dr. H. D. Miser, Washington, D. C., chief engineer of the Federal Bureau of Mines, and N. O. Bradshaw, also of Washington, representing the Metals Reserve division of the Reconstruction Finance Corporation.

Manganese Mills Will Be Built

Gazette 6-17-41

Financed by Little Rock capital, the first two of several small "rougher" mills will be established in Montgomery county soon to supplement the output of the North American Manganese Corporation's Glenwood mill in filling a \$600,000 contract just awarded to the firm by the Metals Reserve Division of the R. F. C. J. Stacy Henderson, general manager of the manganese mill is near Glenwood, Pike county, its largest land holdings are in Montgomery county. It also has contracted for ore from Polk county and the Cushman field of Independence county.

The "rougher" mills will be located in the various fields for primary crushing of the ore. The Glenwood mill will complete the concentration of ore through water flotation.

Mr. Henderson said that approximately 75 per cent of the ore his firm will mine in Pike, Montgomery and Polk counties will assay 50 per cent. Large quantities of lower grade ore also are available in those counties, but the present contract sets a minimum of 48 per cent ore for sale to the government. Lower grade ore may be sold elsewhere, Mr. Henderson said.

The ore will be delivered to a firm, announced here yesterday. Mr. Henderson said the original \$600,000 contract is for 15,000 tons of 48 per cent manganese content ore. The firm also has received an offer from the Metals Reserve Division to buy a total of 300,000 tons of Arkansas manganese, Mr. Henderson said.

\$75,000 Mill Ready Soon.

Scarcity of steel and metal equipment due to the defense program has delayed delivery of equipment for the \$75,000 mill near Glenwood, but the plant will be in operation in six weeks to two months, Mr. Henderson said. The plant will have a capacity of 200 tons of crude ore daily. When the mill is completed and the operations in the field get fully under way, approximately 150 persons will be employed, Mr. Henderson said.

While the corporation's principal stock pile at Gurdon, where the government will store the ore until needed. The site of the pile at

Gurdon has not been decided. The 15,000-ton contract must be filled within three years after the first delivery. The firm was permitted six months to begin delivery, but it expected that shipments will be started in one to two months, Mr. Henderson said.

William Dexter is president of the corporation; John E. Harter, secretary, and E. Haase, treasurer. All are of St. Louis. The Little Rock investors have not been announced.

Manganese In Greater Demand

Special to the Gazette. 7-6-41

Cushman, July 5.—Demand for and interest in manganese have increased the past month, but the price has remained stationary.

Furnaces have been taking some 35 per cent ore and have bought a few batches of hard 30 per cent ore when the character of the ore justified it.

New Firm Enters.

Several concerns are investigating the ore deposits in the field. Durst & Smith of Texas have taken a lease on the Grubb Cut mine near Cushman and are starting operations. They are building an office and installing a set of scales at Big Spring mill, and also will put in a washer. They will be producing soon.

The Arkansas Manganese Co., headed by J. H. Gibbon, started operations again when the mineral content requirement was lowered to 35 per cent. Mr. Gibbon has reconditioned the big washer on the Aydelotte property and soon will be producing approximately 100 tons a week. Most of the ore produced on this property is wad ore.

The old Club House mine, near Cushman, which was believed to have been mined out, is producing again. Two large drifts had been cut through the mountain, and much ore taken out. Miners prospected the long rib between these drifts last month and found that it contained pay ore. Two cars have been mined from this rib, and it promises a fair production for some time.

Further Surveying Planned.

Due to the excellent ore uncovered by the Bureau of Mines' first survey, which ended Tuesday, an allotment has been made for a second survey, beginning next week.

Wad ore again will be investigated, and a new device, known as a California cesspool digger, will be used. Mounted on a truck and using a 35-foot derrick, the rotary drill cuts a 26-inch hole through soft formations. Hand mining will be used to penetrate the 30 or 40 feet of hard formation overlying the ore, and the drill will be used on the ore. This will shorten the drilling time considerably.

Manganese Miners to Test New Type Ore Washer.

Special to the Gazette. 7-13-41

Cushman, July 12.—A promising new washing unit invented by Mr. Pollard, WPA foreman at Piggott, will be investigated by Cushman manganese miners soon, to see if it can be applied to manganese ore. The washer has been used successfully on sand and gravel for more than a year. It is a very inexpensive and simple machine, consisting of an eight-inch revolving screw, with a rotary screen attached to the end from which the material is discharged. The whole is laid in a box about two feet wide and 12 feet long on bearings, and is pulled with a five horsepower gasoline engine. It washes 100 yards of sand and gravel a day. Six men can load it on a truck in a few minutes, and it can be reset in a short time with practically no expense. By using several different size mesh screens in the revolving screen at the end, ore can be sized.

New Firms In Manganese Field

Special to the Gazette. 8-17-41

Cushman, Aug. 16.—Two new mining concerns have started operations in the Batesville - Cushman

manganese field and are using steam shovels and other heavy equipment. One is the Independence Manganese Co., composed of A. A. Michels, A. R. Venuto and Aloys Schierman of St. Louis. The other is the Arkansas Manganese Co. composed of H. Somsom of St. Louis, Mo., Dave Berlin of Little Rock, and Karl Keys of Mountain Home.

The Independence Manganese Company has 1,500 acres under lease on the head of Cave creek, which lies a few miles west of Cave City. It has two gas shovels in operation and employs 20 men.

It also operates three big trucks and added a big scraper-carrier this week. The latter scoops up five tons at a load and carts it out of the pit. The company has one big pit about 75 feet in circumference, in which one of the big steamshovels is working, and from which operators are taking ore, running from low to high. These operations are on the old Winford Gray property, which was operated during the World war.

The Arkansas Manganese Company is operating on an 80-acre sub-lease taken from the Independence company. It also is using a big gas shovel. Both concerns are making fair production.

The production of the field is approximately 700 tons a month. The demand is strong, but there has been but little change in the price. Much more ore could be produced and sold if enough labor were available. The labor shortage in the field was caused by miners leaving the field for jobs on defense projects. Furnaces have been taking ore that runs as low as 30 per cent for more than a month, which has been a factor in the increased production.

The Walter H. Denison Manganese and Contracting Co., Inc., is shipping approximately 400 tons a month, and could ship more if more miners were available to mine the ore.

The Batesville-Cushman Field is becoming nationally known, and Reed Denison, active head of the Denison Company, receives letters from manganese producers all over the West. This week he bought one big car of ore in Kanab, Ut.

The Arkansas Manganese Company, operating on the Aydelotte property near Cushman, is making an average production of 250 tons a month. About 50 miners are at work in 10 shafts. A big washer is in operation most of the time.

Hope For Manganese Plant Seen

Special to the Gazette. 8-28-41

Batesville, Aug. 27.—If a government survey now in progress shows that the manganese fields in this area possess as much as 3,000,000 potential tons of manganese, Congressman Wilbur D. Mills of Kensett said that the government probably will establish a reduction plant near the center of the field.

Mr. Mills spent most of yesterday here. He said he had only recently talked to high OPM officials in Washington about the possibility of a manganese plant in this section. "I have been assured by responsible officials," Mr. Mills said, "that the government has earmarked funds for large manganese reduction plants in Arkansas and in Minnesota if current government surveys show that the respective fields have as many as 3,000,000 tons of recoverable manganese. I am told that the so-called Cushman field has untold ore reserves underground that have never been tapped, and that the field extends into four counties. If this is true it appears that this area stands a good chance of getting such a plant on the basis of the results of the survey."

"OPM officials will not commit themselves on the exact location of such a plant, if it is constructed, but I have no doubt but what it would be built somewhere in the heart of the ore supply which certainly wouldn't be very far from Batesville."

Hope For Manganese Plant Grows

Special to the Gazette. 9-21-41

Batesville, Sept. 20.—Miss Robert Ella Case, secretary of the Chamber of Commerce, has received a letter from Congressman Wilbur D. Mills saying that he is "much more hopeful of success" in locating a manganese beneficiating plant in the Cushman field.

The congressman wrote:

"Upon my return to the office, I investigated the progress of our effort to secure location of a manganese beneficiating plant within the Cushman field and I am happy to report that I am much more hopeful of success than when I discussed the matter with you during my recent visit in Batesville."

"This morning Dr. E. R. Sayers, director of the Bureau of Mines, advised me that the field forces of that agency now engaged in making a survey of the manganese deposits within the Cushman field would be doubled within a few days in an effort to complete that essential preliminary phase as quickly as possible. Dr. Leith of OPM reassured me that his agency will accord the proposal favorable consideration if deposits sufficient to justify the installation are disclosed by the survey."

"In view of the favorable and cooperative attitudes of these authoritative officials and their jurisdictional agencies, and having confidence that the minimum requirements of 3,000,000 long tons of ore will be established by the survey now in progress, I am inclined to view the situation with real optimism."

150 Miners On Manganese Survey Job

Special to the Gazette. 10-5-41

Cushman, Oct. 4.—One hundred fifty miners will be employed by the Bureau of Mines, which now is investigating manganese ore deposits in this field, when work on a new project east of Cushman gets in full swing. Operations are in charge of M. A. Tessmer.

First Tests Satisfactory.

The Bureau of Mines reported recent investigation of wad ore on the Aydelotte property near here were very satisfactory. Tests were made by the shaft method, and many were sunk with a rotary bucket (cesspool digger), which cuts a circular hole two feet in diameter. (They have changed the name of this machine to rotary bucket, because the word cesspool has no connection with a mine shaft on a deposit of manganese ore.)

Work has been started on the new project, which takes in approximately 2,000 acres of manganese land lying about 10 miles east of Cushman. Tests here also will be conducted on wad ore, and the rotary bucket method will be used. It is expected that approximately 75 test shafts will be sunk. When these operations are completed approximately 350 shafts will have been sunk in investigating deposits of wad ore.

The area covered by the new project takes in some old mines from which much ore has been mined and shipped. They are the Wild Cat, Section 16, Napoleon Hill, Shaw Hill, Bell Hill, Perrin-Haywood and Kelley.

Commercial ore produced in the field during September amounted to approximately 1,000 tons, most of it coming from the Walter H. Denison properties, and the Arkansas Manganese Company's Aydelotte mine. Some ore was produced by Lou Peterson on the Polk-Southard and Turner mines. When labor is plentiful, Mr. Peterson produces approximately 50 tons of high grade a month.

Labor Still Scarce.

During the last month production has been held down by shortage of labor. Some of the miners have taken their families and gone to the bottoms to pick cotton. Others have taken jobs on government defense projects and army camps. September, however, is always the low month of the year in the field be-

cause of crop gathering.

Reed Denison, who buys most of the ore in the Cushman field, has established a market for manganese in Arizona and shipped one car from Winslow last month. Arthur Shaver, brother of Mrs. Reed Denison, has charge of the Arizona operations. Mr. Denison hopes to build of a good market for manganese in the Winslow area. The ore he is buying there runs about 45 per cent.

After dropping out of the Cushman market for several weeks, the Electro Manganese Corporation of Knoxville, Tenn., is taking Cushman ore again. Carbonates seem to be the best ore for the electrolytic process. During the last two weeks Mr. Denison has shipped five carloads from the Casson mine, on which he recently took a lease, to the Knoxville firm.

This concern has increased its production from one to two tons of pure manganese a day. It is said that at this time the demand is for 20 tons. The manganese metal produced by this process runs over 99 per cent pure, the highest grade produced in the world. Most of it goes into various alloys to give them tensile strength.

Power Needed For Plant Here.

If there were plenty of power at a competitive rate in the White river valley, the Cushman field could supply a plant of this type with plenty of ore to keep it in steady operation. It is said that this kind of a plant would consume as much or more power than the Norfolk dam will produce.

Manganese Mill Being Installed

Special to the Gazette. 10-12-41

Mena, Oct. 11.—Machinery capable of mining and crushing 40 tons of manganese ore daily was moved to the Camp Wilder mine, across the Bee Mountain ridge of Mena in the national forest area, this week. C. J. Culp, Texas mining operator, and associates selected the site after a year of exploration. Tom Shalin will be mine foreman.

The equipment includes a 40-ton ore crusher, compressor, two jack hammers, a three-spigot ore jig, said to be the first modern separator for ore in the county, and the roller mill.

The mine is located about one-third the way up the mountain side. A stream at the foot of the mountain offers a water source. Blasting for ore will be diagonally at first, with the vein to be followed thereafter.

Samples of ore taken there indicate a good manganese content, Mr. Culp said.

Extensive Manganese Test Planned

Special to the Gazette. 10-26-41

Hope, Oct. 25.—The Manganese Development Company of Hope, began operations this week on its leased properties in southeast Polk county. Heavy equipment has been moved to the site for use in construction of a road.

Mining equipment will be used to produce manganese where it is known to exist and to prospect for additional deposits.

The area in which operations have started is in the Ouachita National Forest. Seven claims totaling approximately 120 acres were staked about two years ago, and assessment work to comply with mining laws since has been done.

The claims are the property of George A. Holt et al., of Hope. The development company formed to operate the property is composed of T. S. Rivers of Dallas, E. R. Needles of New York city, Ted Campbell of Kansas City, R. F. McCune of Dallas and Albert Graves and R. D. Franklin of Hope.

Engineers' estimates and analyses of the ores taken from the claims have indicated that manganese may be available in sufficient quantities to open up a new source of supply for southern steel mills, officials said. This, however, can be determined only by the detailed prospecting of the area.

Manganese Production Regains Pace

Special to the Gazette. 11-9-41

Cushman, Nov. 8.—During the last four weeks the production of manganese ore in the Cushman field has fallen off, due to lack of labor and extremely wet weather. Most of the labor went to the cotton fields and is drifting back now and in another week or two it probably will be back to normal.

October production in the field amounted to approximately 540 tons. Leasers on the Arkansas Manganese Company's Aydelotte property produced 240 tons of wad, and those on the Walter H. Denison Manganese and Contracting Company's properties produced 300 tons. The demand for the higher grades of ore is strong, but the price has not advanced recently.

The Walter H. Denison Manganese and Contracting Company still is supplying the Electrolytic Manganese Corporation of Knoxville, Tenn., with carbonate ore from the Casson mine. Eight cars have been shipped, and shipments will continue. The biggest production in the field at this time is being made around Pfeiffer.

Investigations Still Under Way.

The Bureau of Mines still is investigating ore deposits of the field. It is probable but not certain that enough ore will be proven to justify much larger operations, even the installation of a beneficiating plant for low grade ore. This investigation work is in the charge of Harold Ewolt, T. A. Mendricks of the United States Geological Survey, is the geologist.

The work being done by the Bureau of Mines is a part of the government's program for investigating strategic ores all over the United States. The work that has been done in the Cushman field can be classed as successful. While crews have worked over a much larger area, they actually have prospected 800 acres.

Their work has been confined largely to carbonate and wad. The former is associated with limestone, and is not regular in its mineral content. Some runs high, some low. Most of it needs beneficiating to make it desirable for furnace uses. Wad ore is a hydrous oxide ore which contains too much phosphorus. Samples of both types of ore have been under investigation by the Bureau of Mines laboratory at Rolla, Mo., and beneficiating processes have been studied to improve them. It is said that these experiments have been successful but have not progressed enough to justify revealing any definite process.

Cushman Producing Twelfth Of Nation's Manganese.

Special to the Gazette. 11-30-41

Cushman, Nov. 29.—Production of domestic manganese is increasing monthly, and with the new beneficiating processes now in sight by next year, it is likely that it will be much larger next year than this. The production for June was 4,600 tons; July, 6,000 tons, and August, 9,100 tons. These figures cover only ore from 35 per cent up. The Batesville-Cushman field is producing about 1-12th of the entire domestic production. Total imports of manganese ore average 65,000 tons monthly.

Arkansas Manganese Mines

Important Mineral Contribution to the National Defense Program Is Made by Mines Of Two Long-Operated Fields in This State.

By Tom Shiras

Gazette 11-30-41

A big gun fires on the Moscow front, recoils, with a terrific strain on the long barrel. There is no bulge or fracture in the lock or barrel. There is the rat-tat-tat of a machine gun. It cools off and there is no damage to the piece. Enormous tanks plunge over rough terrain, tearing out boulders and leveling huge trees, with no impairment. Thousands of tanks, trucks, artillery pieces, small guns, jeeps and many other items are now coming off the production lines for defense weekly, that will stand up under the most trying conditions. Their strength centers on the toughness and tensile strength of steel. Manganese gives steel this quality.

With its very important strategic war minerals, Arkansas is contributing as much to the defense plan as any state in the Union, and manganese ore from the Batesville-Cushman field is playing a very important part in this program. Six hundred tons a month now flow from this field to the steel plants, and this is only a very small tonnage compared to future production.

Manganese belongs to the iron family. Its father is iron. Its brothers and sisters are cobalt and nickel. They are frequently associated with each other in nature; and, in fact, one of the most common modes of occurrence of manganese ore is with iron ore deposits. It occurs in the forms of oxide, silicate and carbonate. It is an essential constituent of many minerals and is found in almost all metamorphic, eruptive and sedimentary rocks. It also represents one of the 22 or more elementary substances found in meteorites. Rhodonite, one variety of the carbonate ore, is often cut for jewels on account of its beautiful pink color, and the purple of the amethyst is supposed to be due to the presence of manganese.

Manganese also is present in the

mines manganese every day, but doesn't know it. People mine it with their teeth and benefitate it with their digestive tracts. Every time they drink a cup of coffee or tea, they absorb a tiny mite, and the same is true every time they take a bite of potato, squash, beets, carrots, grapes, apricots, wheat, rye, rice and many other vegetables, fruits and cereals. It also occurs in several species of cinchona, the source of commercial quinine.

Thus use of manganese in the arts is of great antiquity, and dates back as far as the early Egyptians. One of its first uses was in glass making, and analyses of Egyptian and Roman glassware have shown the presence of one and one-half per cent of metallic manganese. The name manganese was derived from the Latin expression *magnesia nigra*.

In the early days manganese was not known as a distinct mineral. It was thought to be a variety of magnetic

of steel by the invention of the Bessemer process, less than 20 years later, another great use for manganese was found, and it has become such an important factor in the metallurgy of steel that this industry now probably consumes over nine-tenths of the manganese ore produced in the world. It is also being used now to give strength to numerous alloys, in the manufacture of bromine, to decolorize and color glass, dyes, a dryer in paints and varnishes, electric batteries, and for many other purposes.

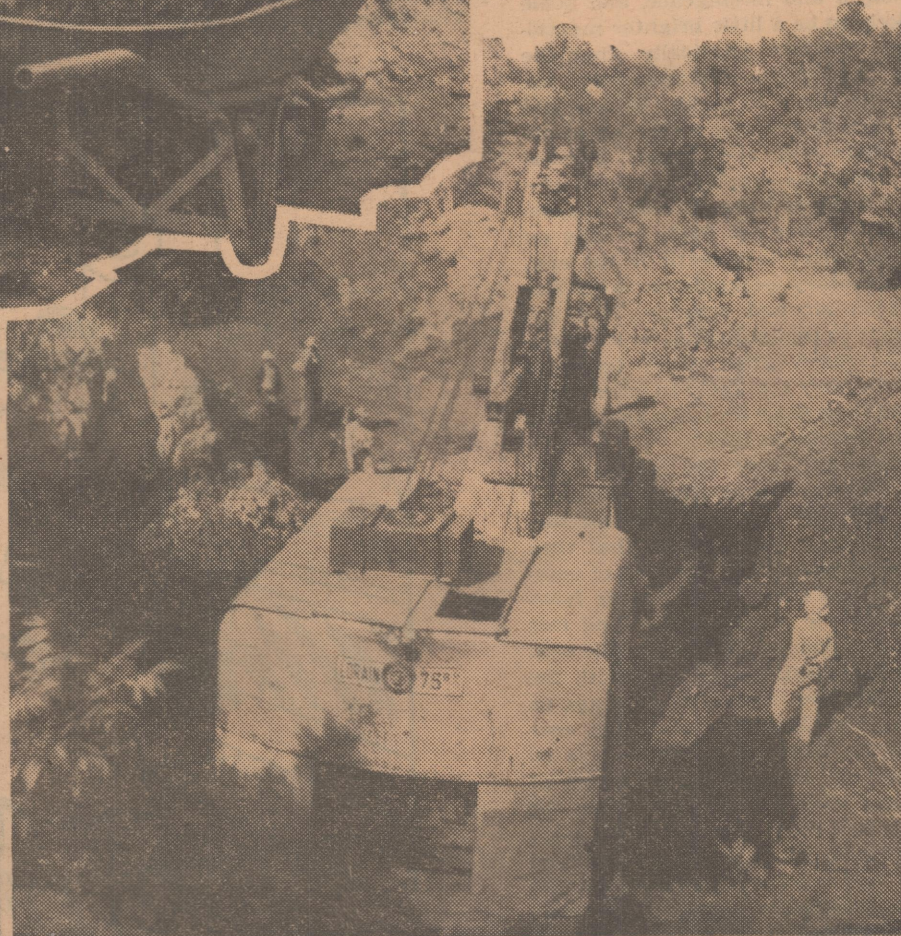
Manganese occurs in two sections of Arkansas. In the Batesville-Cushman field, which takes in parts of Independence, Izard and Stone counties, and in the southwestern part of the state, extending from Pulaski county on the east, to Polk county and Oklahoma on the west. In the latter region mining has been very limited owing to the type of ore deposits.

The Batesville-Cushman field is one of the oldest mining fields in the South.

state geologist of Tennessee. Colonel Martin mined his properties to a limited extent, and as early as 1850 shipped small quantities of ore to Boston, New York and Philadelphia. One shipment was made to the chlorine works of Charles Tennant in Glasgow. All this early production was shipped down the White river, in barges, to New Orleans, and thence by ship to destination. All of the ore shipped by Colonel Martin was used for chemical purposes.

William Einstein of St. Louis made the first shipment from the Batesville-Cushman field for steel purposes. It was bought by Schoenberger and Company, Junita Iron Works, Pittsburgh, Pa. Other early day operators were the Ferro-Manganese Company, represented by E. H. Woodward, who started operations in 1881. Keystone Iron and Manganese Company, St. Louis Manganese Company, Missouri Furnace Company, American Manganese Company, White River Manganese Company, Arkansas Manganese Company, Blair Mining Company, H. M. Hodge, R. R. Case, I. N. Reed, J. P. Montgomery, John W. McDowell, A. A. Steele, William Reeves, J. B. Gray, Messrs. Pritchett, Skinner, Abbot, Ring, Rus-

Ore is being mined by hand in the picture at the left, taken near Cushman. The ore is lifted from a 70-foot level with a hand windlass. At the lower left is a manganese mining scene, also near Cushman, in which ore is taken from a 70-foot level with mule hoist. In the picture below manganese is being mined with a power shovel in the Batesville-Cushman field.



Henry Rowe Schoolcraft of Watervleit, N. Y., first scientist and geologist to investigate the mineral deposits in the Arkansas and Missouri Ozarks, identified manganese in the Batesville, Ark., region in 1819.

Col. Matt Martin, early pioneer of Batesville, was one of the first to really discover the value of manganese ore, and between 1848 and 1850 he and M. D. Fields acquired large tracts of land in the manganese region. Ore today is being produced on some of this land. This investment was made on the advice of Gerard Troost, at that time

sell, Drake and others. Some of the properties still carry these old names. The old St. Louis and Iron Mountain built a branch line from Batesville to Cushman in 1886, which wiped out transportation difficulties and thousands of tons of ore were shipped from the field before 1900.

The Walter H. Denison family of Cushman has been prominent in the manganese industry in the Batesville-Cushman field for over 55 years, and it has been due largely to their efforts that the field has always been on a productive basis.

When the Keystone Iron and Manganese Company of Pennsylvania came into the field in 1885, Walter H. Denison, then a boy, started weighing ore for them. From that time on until the present day they have been the greatest factor in ore production in the field. In recent years Walter H. Denison turned the manganese end of his business over to his son, Reed Denison, and he has maintained a market and production for the ore from the fields. During the last year he has also investigated all of the manganese ore deposits in the South and West, and is one of the best informed men on manganese ore in the United States.

The real importance of the Batesville-Cushman field was felt during the first World war, when foreign shipments of manganese ore were cut off. Hundreds of miners came into the field from all over the United States, and the production was stepped up to overcome losses from foreign sources. It is assuming the same importance today.

The ores in the field are oxide and carbonate. The former occurs in residual clay from the St. Clair limestone. That which occurs in large chunks, from the size of an egg to larger pieces is ready for the market as it comes from the ground. The finer sizes have to be washed and jigged to get rid of foreign substances.

The carbonate ore was discovered about 10 years ago by two miners on Lafferty creek. They brought in a wagonload of smooth, oxide ore boulders. An ore buyer for Walter H. Denison at Cushman thought they looked queer and broke one of them with a hammer. The oxide ore was apparently veneered, on what appeared to be St. Clair limestone, or "gray rock," to a depth of several inches. The load was rejected as marketable ore.

Later, Reed Denison examined a core of the boulder and noted its extraordinary weight. He sent it away for analysis and identification. It was identified as manganese carbonate and ran high in mineral content.

The carbonate ore in the Batesville-Cushman field lies cunningly hidden by nature, in a blanket vein on top of the St. Clair limestone, and it so closely resembles this limestone in color and appearance that its true nature is hard to detect except by weight.

It is obvious now that the carbonate is the primary ore of the field from which all of the oxide ores have been derived. The deposits of oxides were formed when sections of the St. Clair limestone were broken down by surface waters and erosion, letting down the fragments of the carbonate ledge above which lodged in the residual clays below and changed their chemical nature from carbonate to oxide.

The chemical change from carbonate to oxide starts almost immediately the carbonate is exposed to the air, and is easily noted in the ore stacked on the ore yards. About three weeks after the carbonate is mined, a yellowish cast is noted. Several weeks later it takes on a blue or oxide color. As time progresses this veneer deepens into the carbonate and continues until the entire piece is oxidized. The time it takes for complete oxidation has never been determined, but it must take years. All of the carbonate ore mined in the field before it was really identified was taken for St. Clair limestone and tossed into waste dumps. Since its identification, hundreds of tons of marketable ore have been salvaged from these piles. The discovery of carbonate ore added many thousands of tons of potential production to the field.

Besides the chemical uses of manganese ore, that which is not directly mixed with iron ore at the furnaces for the manufacture of steel is converted into ferro-manganese, which contains from 60 to 70 per cent metallic manganese, and for the production of pure manganese metal, running over 99 per cent, which is produced now by the Electrolytic Manganese Corporation, of Knoxville, Tenn., by the electrolytic process. This process consists of dumping the crude ore into chemical vats, which leaches out the mineral content of the crude and throws it into solution. This solution is then run over thin, stainless steel electrodes, precipitating on them as pure metal.



animal and vegetable kingdom. A soldier wounded by a piece of shrapnel may think that this wound is his first taste of manganese, but it isn't. It is said to form an essential constituent of the tissues and red blood corpuscles of the blood in the human body, being present in the proportion of one part of manganese to 20 parts of iron.

Every human being in the world

iron ore. Some called it "a peculiar earth." Dr. Kahn of Vienna isolated the distinct manganese metal in 1776, from oxide ore. For years it was used only for decolorizing glass. Later it became a necessary element in the manufacture of chlorine. With the introduction of manganese in the manufacture of steel by Heath, in 1839, and the subsequent immense increase in the manufacture

This pure manganese metal is very valuable for alloys and other purposes. Carbonate ore from the Batesville-Cushman field is highly adaptable for this process and practically all of the carbonate ore produced in the field is used by the Tennessee concern.

The importance of manganese ore as a strategic war mineral has long been recognized by the government, and in August, 1940, the Bureau of Mines sent a party into the Batesville-Cushman field for the purpose of investigating the deposits of low grade ore. Their work has been largely confined to carbonate ores, and wad, a variety of the oxide ores. While no definite figures as to the actual tonnage proven in the field have been released, their work can be classed as successful. At the present time it is in charge of Harold Ewolt. Co-operating with him is T. A. Hendricks of the United States Geological Survey. Low grade ore samples have been sent to the Bureau of Mines laboratory, at Rolla, Mo., for experimental work on beneficiating processes. It is said that successful processes have been worked out on these low grade ores, but no formulas have been released.

Manganese Plant Location Uncertain.

Gazette 12-9-41

Washington, Dec. 8 (AP).—Representative Mills (Dem., Ark.) said tonight that a survey by Bureau of Mines engineers to determine whether a \$5,000,000 manganese plant should be located in Arkansas had not been completed.

Office of Production Management officials disclosed some time ago they planned to locate one such plant in Arkansas, one in Minnesota, if ore deposits in those states justified it.

Mills said the engineers were studying deposits in Independence county. The plant under consideration, he said, would require at least 3,000,000 long tons of manganese ore deposits.

Huge Order Of Manganese Reported

Special to the Gazette. 12-20-41

Hot Springs, Dec. 19.—Partial confirmation was given today to a report that the War Department had contracted for 10,000 tons of manganese from the large deposit recently discovered in Montgomery county.

Following a survey of the field by government geologists, the contract awaits only signature by federal officials, it was reported.

Capt. Elmer Bird, veteran mining engineer, who was state chemist during Governor McRae's administration, would not discuss the proposed contract but was enthusiastic about the Montgomery county manganese prospects.

"Few persons realize the amount of manganese that has been taken out of Arkansas," he said. "Records in the state Geological Department will show that 400,000 tons have been shipped. The manganese came from Independence, Pike and Montgomery counties.

"With proper mining facilities Montgomery could be the scene of the largest manganese production in the United States. There is not one deep mine in Arkansas."

Manganese Price Increase Expected.

Gazette 12-20-41

Washington, Dec. 19 (AP).—Senator Thomas (Dem., Utah) said he was informed today the Metals Reserve Company, a subsidiary of the Reconstruction Finance Corporation, shortly would substantially increase the maximum price it pays for chrome and manganese.

Thomas is chairman of the Senate Military Affairs Subcommittee studying strategic metals supply.

He said he was informed by George W. Malone, former Nevada engineer and special consultant to the committee, that the maximum price on chrome would be raised from \$43 a ton to \$50, and the top price on manganese would be increased from \$28 a ton to \$36.

The previously fixed prices were based upon delivery to west coast shipping points. The new prices would be based upon delivery to the railroad nearest the mine and the government would pay all assay costs hereafter, Thomas said.

"With war raging in both Pacific and Atlantic waters it becomes absolutely imperative for this country to increase domestic production of strategic and critical minerals and products, including manganese, chromite, tungsten, mercury, antimony, copper, zinc, molybdenum, magnesium, and aluminum," Thomas said.

Batesville Hopes For Manganese Plant.

Special to the Gazette. 12-28-41

Batesville, Dec. 27.—Although nothing authoritative has been announced, the belief is growing here that a manganese beneficiating plant will be built in this area, with Batesville the favored site.

The growing need for manganese in the defense area eventually will result in establishment of a mill to utilize the vast quantity of ore from the Cushman field near here, leaders here believe.

NEW RUSSELLVILLE PLANT TO REFINE MANGANESE ORES

Special to the Gazette. 1-4-42

Russellville, Jan. 3.—A refining plant to manufacture manganese sulfate, a widely used chemical product, will be built near Russellville soon, Dr. R. L. Smith, president of the Smith Mining Company, which will build the plant, announced today.

Using Arkansas manganese ore, the plant will have a capacity of five tons per day of the finished product. The company will expand the plant as soon as additional markets have been established. It will be the only plant of its kind in the state.

A new process for making manganese sulfate from low grade manganese ore, such as is found in Arkansas, was discovered recently by Troy W. Carney, the Smith company's chemist, and a patent for the process has been applied for. The process not only has made possible a new industry for this area, but has provided a use for large amounts of low grade manganese ore in Arkansas which has previously been considered unsuitable for use.

Manganese is found principally in Polk, Montgomery and Independence counties, but deposits also exist in Garland and in the counties adjoining Independence in the Batesville area. Development has been slight, however, because the Arkansas ore is low grade; that is, it contains large amounts of silica and phosphorus, which must be removed before it can be used.

Manganese is essential to the production of steel and is also used in alloying bronze and for other chemical purposes. The principal uses of manganese sulfate are as an ingredient in fertilizer, poultry feed mixtures, and in drying oils for paint.

Establishment of this plant probably will be the beginning of a permanent industry for Arkansas, because manganese is in constant demand in normal times as well as of particular importance in war production.

One Patent Obtained; Another Applied For.

The Smith company has a patent on a process for removing phosphate from low grade manganese ore, also perfected by Mr. Carney, and has applied for a patent on another process to remove silica, which makes possible the use of much manganese ore, which has previously been thrown away as worthless.

After elimination of the phosphorus and silica, the Arkansas manganese ore already processed by the company has assayed 40 to 50 per cent pure, which makes it suitable for all normal uses.

The government has designated manganese, bauxite and cinnabar as strategic minerals. The last two minerals also exist in Arkansas in large quantities.

The Smith company has made some progress in milling low grade bauxite ore. Much of this ore also has been cast aside as useless in Arkansas.

Low Grade Bauxite Refining Studied.

The plant will be built near Russellville as soon as construction arrangements can be completed, Dr. Smith said. It will not be located inside the town because of the odorous fumes the plant will generate.

Mr. Carney, who has been chemist for the Smith company for the past two years, formerly was connected with the Athletic Mining and Smelting Company at South Fort Smith and previously was in the Research Department of the Eagle-Picher Lead Company at Joplin Mo. He is a chemistry graduate of Drury College and also studied at the Universities of Arkansas and Missouri.

The Smith company's laboratory here is believed to be the only private laboratory of its kind in Arkansas. Dr. Smith, the president, also operates St. Mary's hospital in Russellville and is a practicing surgeon. He also is a member of the Board of Trustees of Arkansas Polytechnic College.

HOPE GROWS FOR MANGANESE PLANT IN CUSHMAN AREA

Special to the Gazette. 1-11-42

Cushman, Jan. 10.—While no definite information has been released concerning the location of a beneficiating plant in the Cushman manganese field, everything points that way, and it is expected that a plant will be constructed here to handle wad ore sometime this year.

Most encouraging recent sign was the completion of an investigation by the Bureau of Mines, which has been surveying the field since July, 1940. Having reached its tonnage goal, it will terminate its work Friday. The survey proved up deposits aggregating approximately 2,000,000 tons. These deposits are in a section between Cushman and Hickory Valley in Independence county.

Ore Refinery Up to the OPM.

Installation of a beneficiating plant is up to the OPM. With imports practically cut off and a domestic consumption of 300,000 tons annually, such a plant in the Batesville-Cushman field seems necessary. The survey just completed was confined to approximately 2,000 acres, or five square miles. The necessity for completing the survey as quickly as possible caused the bureau to prove up ground where ore was known to be present.

The field, however, is so large that with proper labor and equipment, it easily could produce 100,000 tons a year, or one-third of the estimated domestic consumption, engineers believe. The field is eight miles wide and 22 miles long, embracing 192 square miles. Including ore bearing sections in south Stone county, the field is even larger.

The Bureau of Mines drove 15,000 feet of shafts and drifts by hand, drilled 4,000 feet which churn drills and dug 4,100 feet with a rotary bucket rig. The rotary buckets cut holes of two sizes, 16 and 26 inches in diameter. Most of the work was done with the 26-inch bucket. The rotary rig was used only in soft ground. As many as 150 men have been employed in the survey. These men will return to mining after Friday.

Most of the investigations have been on two varieties of ore, carbonate and wad. Carbonate was surveyed until February, 1941, and wad, since.

Two types of beneficiating plants could be used on these two varieties. The carbonate ore is adapted especially to the electrolytic process, and hundreds of tons of carbonate has been shipped during the last 18 months to an electrolytic plant at Knoxville, Tenn. Power from the Norfolk dam could be used for such a plant in the Batesville-Cushman field.

A successful furnace process has been worked out for the wad ore.

Would Require Entire Norfolk Dam Output.

As such a plant would require the entire electrical output of Norfolk dam, talk of using this dam's power for projects outside the White river valley is receiving no encouragement in this section. Any move to use this power in other than this area probably would be fought.

Iowa Firm Operating Sims Bros. Property.

Private development of the field continues. The largest concern that has started operations recently is

Manganese Inc., a Sioux City (Ia.) firm, which took over the Sims Bros. holdings, consisting of 425 acres, in Stone county, directly across the river from Guion, Izard county. The firm will employ power shovels, a Ute for stripping, and other modern equipment.

Charles Sims of Cushman, one of the former owners of the property, said the new owners have one blanket vein of carbonate ore, from 4 1-2 to seven feet thick, which runs clear through the mountain. Many other outcrops are visible. The firm will haul its ore to Guion and ship via Missouri Pacific. A side track is being laid at Guion to accommodate the business. Donald Frazier of Sioux City heads the company, and H. B. Cooper is operating manager.

Production Last Year 7,463 Tons.

Production of the Batesville-Cushman field totaled 7,463 tons last year. Most of this was produced and shipped from the Walter H. Denison Manganese and Contracting Company lands and the Ayd-lotte property. The latter is mined by the Arkansas Manganese Company, headed by Jack Gibbons of Batesville. The Denisons shipped 3,742 tons of high grade, running over 40 per cent, and 2,221 tons of low grade, averaging 28 per cent. The Arkansas Manganese Company shipped approximately 1,500 tons, averaging 35 per cent. Because the furnaces would not accept anything under 40 per cent until mid-summer, the Arkansas Manganese Company did not swing into production until July 1. Its production this year will be much larger.

The price of carbonate has risen \$1 a ton, and the price of high grade oxide, \$2 a ton.

Several new mines are being opened up in the Pfeiffer area.

Not All Manganese Is Used to Make Steel.

Manganese, which Arkansas mines in considerable amounts, has numerous uses besides its most important one of hardening and toughening steel.

The black material in the cells of a dry battery is a form of manganese, and the same form of the mineral is employed in paints to make them dry quicker.

An amethyst owes its blue color to manganese, without which it would be plain quartz. Copying this coloring trick of Nature's, manufacturers of china and glassware employ manganese to give a bluish tint to their wares when that color is desired.

At the same time, curiously enough, manganese is used to counteract the yellowing effect of iron in some glass, and render it clearer and more transparent.

Process to Open Big Stores of Manganese.

Gazette 1-21-42

San Francisco, Cal., Jan. 20 (AP).—A chemical key that might unlock great stores of manganese for use in production of steel supplies was described today by engineers developing Western ores.

Mack C. Lake of San Francisco, vice president of Manganese Ore Company, subsidiary of M. A. Hanna Company of Cleveland, said that by use of the chemical process the company would be able to produce about 100,000 tons a year of high-grade manganese ore from deposits once considered almost useless.

The first deposit to be tapped is southeast of Las Vegas, Nev. Lake said negotiations were completed with the government for construction there of a \$4,500,000 mill to be in operation this year.

A chemical reaction which concentrates low-grade ore is the secret of the new process. First the ore is crushed, then leached with water and sulphur dioxide fumes, to turn the manganese into manganese sulphate, which dissolves in water. The solution is removed from the sludge and evaporated into dry white crystals of manganese sulphate which a roasting turns into manganese oxide, 60 to 65 per cent manganese.

Mills Says Manganese Plant Assured

Special to the Gazette. 1-25-42

Batesville, Jan. 24.—A statement that the Office of Production Management had approved the erection of a manganese ore reduction plant

in the Batesville area was received today by Postmaster Virgil Butler from Congressman Wilbur D. Mills.

Mr. Mills added, however, that details as to location, amount to be expended and operational policies have not been worked out by officials of the Reconstruction Finance Corporation.

Congressman Mills has been working with government officials in an effort to obtain the project for this area since the emergency began.

Arkansas Manganese Plant Urged

Gazette 2-1-42

Tucson, Ari., Jan. 31 (AP).—Government purchase of milling grade manganese ore and erection of six concentrating plants in Arizona, New Mexico, Utah, Montana, Arkansas and Tennessee have been recommended by the United States Bureau of Mines, the bureau chief, Charles F. Jackson, said today.

Amount to be paid for the ore, method of payment, exact location of the plants, and related details "are not the bureau's details," Mr. Jackson said, but he expressed the opinion the government may handle the work by engaging commercial companies under contract.

"The bureau has found enough manganese ore to form a back log to feed the plants, and other small properties in the recommended regions would provide sufficient additional ore to run the plants for some time," Mr. Jackson said. "Largest of the plants, under bureau recommendations, would handle about 500 tons of ore a day."

As recommended by the bureau, the Montana plant would be at either Phillipsburg or Westville, another in northeastern Tennessee.

Approval of Plant Also Given by OPM.

Gazette 2-1-42

Action by the United States Bureau of Mines yesterday in recommending a manganese concentrating plant in Arkansas followed by a week the approval by the OPM of such a plant. (The OPM since has been incorporated in the new War Production Board). Congressman Wilbur D. Mills notified Postmaster Virgil Butler of Batesville on January 24 that the OPM had approved plans for erection of an ore reduction plant but details concerning location, capacity and cost had not been worked out by the Reconstruction Finance Corporation.

Approval of a beneficiating plant in the Batesville-Cushman area of Independence county has been expected since the Bureau of Mines announced early this month that its 18-month survey and proved up deposits there aggregating approximately 2,000,000 tons. Having reached its tonnage goal in a survey of 2,000 acres, or less than five square miles, the bureau suspended further investigation. The urgency in proving up ore caused the bureau to prove up only areas where ore was known to exist. The field is so large, however, that with proper labor and equipment, it easily could produce 100,000 tons of ore a year, or one-third the present domestic consumption, engineers have estimated.

If an electrolytic type of beneficiating plant were erected in the Cushman area, it would require practically the entire electrical output of the dam. Anticipating the approval of a beneficiating plant, residents of the area have been demanding recently that the Norfolk dam power be retained for use in the section.

ST. JOE MANGANESE CARBONATE SHIPPED FROM STONE COUNTY

Special to the Gazette. 2-8-42

Mountain View, Feb. 7.—Three cars of St. Joe manganese carbonate have been shipped by Manganese, Inc., to the electrolytic plant in Knoxville, Tenn., the past two weeks. Shipments are being made via Missouri Pacific Railroad from

Guion, Izard county. The mines are located on the south side of White river in Stone county.

Present operations by Manganese Inc., are on the Alex Fuls land. Some prospecting is being done on other tracts under lease or owned by the company. Operations are in the charge of James Cooper, while Jess Watkins, a well known manganese miner of Cushman, is foreman. Drilling is being done with air drills.

The Stone county carbonate has been named St. Joe manganese carbonate, and is the first of its kind mined and sold from the Batesville-Cushman field. It takes its name from the St. Joe marble, and is dark red when it comes from the ground. The St. Joe marble is one of the biggest deposits of crystallized limestone in the south part of Stone county and North Arkansas, starting in the running through most of the counties in the northwest part of the state. Impregnated with manganese in south Stone county, it seems to be one of the geological freaks of the Arkansas Ozarks. In that area it is manganese carbonate, and as it moves on northwest it loses its manganese content and reverts to crystallized lime or marble.

There is no difference in the appearance of the carbonate and the marble. Looking at a chunk of the carbonate, one immediately would identify it as marble, until he picked it up. By its weight he then would know that it was ore.

Reported assays on this carbonate run from eight to 28 per cent. It is said that the bulk of the ore shipped by Manganese Inc., runs from 20 to 28 per cent manganese. It contains less than one per cent of phosphate and about one per cent silica. The bulk is manganese and limestone, which makes it highly adaptable to the electrolytic process. Oxide ores have to be roasted before they can be passed through the process. Carbonate does not.

The metallic content of the St. Joe carbonate apparently increases as it goes deeper, one manganese authority reported.

The St. Joe carbonate runs in a blanket vein, its outcrops showing a thickness of from four to seven feet. At the Manganese Inc., mine where the face of the vein is stripped for several hundred feet, the average thickness of the face is five feet.

It seems probable from the outcrops that this blanket vein of St. Joe carbonate underlies that area running from just across White river from Penters Bluff to a point just across the White river near Guion, and west nearly to the Batesville-Mountain View highway, a strip about 10 miles long and five miles wide. While very little of the area has been prospected, outcrops have been found over most of it.

Mr. Wolford, a Batesville marble man, said that he could trace this vein for about three miles through his property that lies along White River below Guion. While no tunnels have been driven clear through any of the mountains in the vicinity, it has been proven that the St. Joe marble in other areas unites all mountains on which it outcrops. The St. Joe carbonate outcrops on both sides of all the mountains and ridges, and it is highly improbable that it is just a rim. It is more probable that it underlies the whole area. On account of its grade, it probably would not be a marketable ore except during war emergency periods, because of the large amount of waste that would have to be shipped. But if an electrolytic plant were located in the field to utilize the cheap power that will be coming off the White river dams in a few years, the shipping expense could be eliminated and it probably could be utilized at all times.

The carbonate on the north side of White river, which was discovered by Charles Burrows, a Cushman miner, several years ago, is a gray carbonate lying between the St. Clair marble and the Ferndale. The St. Joe also lies on the Ferndale.

Manganese Tonnage Gains in February.

Special to the Gazette. 2-8-42

Cushman, Feb. 7.—Production in the Batesville-Cushman manganese field showed a gain in January despite the bad weather. Reed Denison of the Walter H. Denison Manganese and Contracting Company, Inc., reported shipments of 470 tons during the month. Other shipments from the field amounted to approximately 300 tons.

Prices to miners have been advanced 50 cents per ton on low grade.

Twice as many men are mining manganese in the field now than

last fall. There are approximately 200 men engaged in the industry in all parts of the field.

The Denison company has opened several new mines on the Wild Cat, Bill Jim and 17th Section. These are producing the best grade wad ore. Jack Gibbons, Arkansas Manganese Company, operating the Aydelotte is making a good production.

Preston Grace and Fred Livingston of Batesville, who own approximately 1,000 acres in the field are doing considerable prospect work on some of their acreage in the Lafferty creek area and are opening up some good high grade deposits.

Manganese Ore Contract Signed

Democrat 2-8-42
A contract for 1,000 tons of manganese ore has been awarded by the Metals Reserve Co., the government ore purchasing agency, to Mrs. M. C. Stenger, Little Rock.

Mrs. Stenger said the ore would be supplied from the North Mountain mine in Montgomery County and from the properties of the Dixie Manganese Corporation in Montgomery and Polk Counties. She said she expected the price for the contracted amount to be between \$35,000 and \$40,000 with the government repaying the freight.

Three carloads of high-grade ore are ready for shipment besides enough milling ore, ready for separation, to make another carload, Mrs. Stenger said.

Would Expand U. S. Manganese Production

Gazette 2-9-42
Washington, Feb. 8 (AP).—The Interior Department announced today that the Bureau of Mines had proposed a \$33,000,000 program to utilize low-grade, domestic manganese, for America's vital war-time steel industry.

The nation normally imports from southern Asia, Brazilian and Cuban ports more than 90 per cent of its manganese requirements, officials said, adding they feared a reduction in shipping might result in a deficiency in 1943 without additional processing of domestic ores.

Approximately 11,500,000 tons of domestic ores could be produced annually, the bureau said, proposing that either private industry or the government immediately build 12 plants in eight Western and Middle Western states to apply newly-discovered processes for utilizing the domestic output. All of the plants, the bureau said, could be in operation at the end of the year, and many at the end of nine months.

Approval Of Manganese Plant Seen

Gazette 2-10-42

Washington, Feb. 9 (AP). — A spokesman for the Interior Department predicted tonight the War Production Board will take early, favorable action on a Mines Bureau proposal for a \$38,000,000 program to process low grade domestic manganese ore for use by America's steel industry.

One of the plants, of undetermined size and cost, would be located at Batesville, Ark.

The spokesman disclosed WPB representatives had been in the Mines Bureau's confidence while it studied the manganese situation and prepared its recommendations, just released by Secretary Ickes.

Operator Undetermined.
"We know that they want the manganese," the spokesman said, "and we know that they approve of this plan. From now on, it's just a question of who'll do the job. The Mines Bureau will undertake the plan if the WPB wants it to."

He said he believed the WPB will act as soon as it determined whether the undertaking should be directed to process.

Result of Long Study.
He disclosed that the study, on which recommendations were based, had been going on at least six years, but efforts were halted for two years when war clouds gathered. The spokesman said the bureau already had offered to make its own personnel available to get the program under way.

Subsidy May Be Necessary.
On the question of financing, the spokesman said private industry probably would need to know the extent of government aid before undertaking the project because it

might not be able to operate profitably as a purely war-time activity.

No immediate reaction to the plan was noted to the WPB.

Mills Says Plant Now a Certainty.

Special to the Gazette.
Batesville, Feb. 9.—Congressman Wilbur D. Mills notified officials here today that a manganese beneficiating plant for Batesville was assured. He said the only thing delaying final approval was the decision whether private or public funds should be used for the construction, which may cost \$5,000,000. Details of the plant have not been divulged, as the type of ownership may determine the plant's size.

An 18-month survey recently completed revealed 2,000,000 tons in reserve in a 2,000-acre tract tested.

ICKES PROPOSES BUILDING PLANT AT BATESVILLE

Would Produce Manganese.

Gazette 2-18-42

Washington, Feb. 15 (AP).—Expansion of the nation's mineral and power developments to keep pace with the president's war production schedule was recommended today by the Interior Department which proposed developments and explorations in 25 states and Alaska, among them Arkansas, in a program prepared for submission Monday to a Senate subcommittee studying Western resources.

The Interior Department's announcement said that under the program low-grade domestic ores would be used to help make the United States independent of foreign minerals during the emergency. It would, the department predicted, save "millions of tons" of shipping and "possibly the use of navy vessels for convoy."

Out of many possible power developments in the West, Secretary Ickes' letter to Senator O'Mahoney detailed 17 sample projects in 12 states, calculated to provide 10 billion kilowatt hours of energy annually. Estimated total cost would exceed \$350,500,000.

Proposed mineral and power developments would include construction of a milling plant to produce 294,000 long tons of manganese metal at Batesville, Ark., and mining of 1,500,000 tons of manganese ore in the Batesville district.

Treatment of Low-Grade Ores Held Bottleneck.

The secretary wrote that the problem of obtaining wide use of new processes for treatment of high-cost low-grade ores represented "one of three major bottlenecks in our mineral production."

To solve that problem, the department asked Congress to instruct the Bureau of Mines to work "triple-speed" on development of means for processing low-grade manganese ores, or aluminas and magnesites, plants to use new iron ore reduction processes; economical extraction of copper lead and zinc from low-grade ores; and increased production of alkali and alkaline earth metals such as lithium, sodium, strontium, barium and beryllium.

He said the department was examining all enemy alien patents and processes and advocated that Congress or the president authorize the bureau to examine American-owned patents and processes and their experience records, the information to be confidential. He also proposed that information be made available confidentially to the Geological Survey and the Bureau of Mines for use in speeding exploration work.

Ickes said the second major bottleneck, in production of strategic ores like tin, antimony, mercury and nickel and those not previously considered strategic, such as copper, zinc, lead and iron, could be broken if Congress made funds available for exploratory work by the survey and bureau, involving

assignment of 250 additional engineers and geologists to intensive exploratory work in "low-grade areas" in a tentative list of 22 states and Alaska.

Proposes RFC Loans For Development of Mines.

The third bottleneck, he said, was the problem of obtaining capital for development of short-lived or low-grade ore bodies and mills and smelters to develop them. He proposed, as a solution, that the Interior Department, on request of the War Production Board, be permitted to certify to the Reconstruction Finance Corporation for loans companies or individuals seeking to make such developments. Such certification, the secretary added, should be construed as an obligation on the RFC.

Senator O'Mahoney (Dem., N. Y.) suggested that to this proposal should be added a recommendation to the Ways and Means Committee of the House and Finance Committee of the Senate of "such modification of the tax laws as would tend to stimulate investment of private capital in independent mining enterprises."

Plant to Increase Manganese Output.

Arkansas's manganese production would be "tremendously increased" if the proposed Batesville plant is built, Richard J. Anderson, assistant state geologist, said last night.

The 1941 production was estimated at 7,378 long tons of high grade manganese, an increase of 301 tons over 1940 production. A long ton contains 2,240 pounds.

In 1918, a United States Geological Survey representative reported that at least 250,000 tons of high grade ore (40 per cent manganese) were available. The amount of low grade ore not recoverable for economic reasons was "many times" the 250,000 ton estimate, the U. S. G. S. said.

The United States Bureau of Mines investigated the low grade ore possibilities in the Batesville area late last year. The district has "considerable" reserves of low grade ore, Mr. Anderson said.

Findings were given to the bureau's laboratory at Rolla, Mo., where concentrating problems were studied. The most recent development reported to the state Geological Survey concerned the fact that the War Production Board (then the Office of Production Management) was considering the proposed establishment of a Batesville plant.

Dr. G. C. Branner, state geologist, is in Washington to attend a meeting of the American Association of State Geologists.

Manganese Survey Sought By Congressman Cravens.

Gazette 2-21-42
Washington, Feb. 20 (AP).—Representative Cravens (Dem., Ark.) today asked Dr. R. R. Sayres, director of the Bureau of Mines, for a complete survey of the manganese areas of Polk, Montgomery, Pike, Howard and Sevier counties in Arkansas.

Cravens said recent developments indicated existence of "considerable" manganese deposits in that area "although it has not been thoroughly surveyed to determine the extent of the ore."

Two Manganese Plants to Be Built.

Gazette 2-22-42

Washington, Feb. 21 (AP).—Representative Reece (Denn., Tenn.) expressed belief today arrangements would be completed soon for construction of two manganese ore concentration plants in northeastern Tennessee.

Reece said he understood the Defense Plant Corporation of the R. F. C. would provide all the funds for the plants—which he said "probably won't cost more than \$100,000 each—if private capital was not obtained for at least a part.

The plants, he said, were recommended by the War Production Board and would be located in Carter county, near Elizabethton, and Johnson county, at Shady Valley. Reece said the plants would refine ore of lower manganese content, concentrating the metal to meet high specifications.

LARGER OUTPUT OF MANGANESE URGED BY MILLS

Immediate Federal Action Sought.

Gazette 2-27-42

(By the Associated Press.)
Washington, Feb. 26.—Immediate government action to augment the nation's present supply of manganese was urged today by Representative Wilbur D. Mills (Dem., Ark.).

Mills, principal speaker at a meeting of members of the Federal Bar Association here, said that while there was no shortage of manganese today, "none of us can predict the duration of the present struggle" and guarantee there would be no shortage later.

Arkansas congressmen have sought federal financing of a program to explore manganese deposits in the state. Manganese is a mineral essential in the making of dry batteries, airplanes, tanks, warships, guns and other war materials.

Mills said on the average every ton of ordinary steel contained 14 pounds of manganese. "We are fortunate that sufficient quantities of manganese ore are available within our own borders to make us secure provided these quantities are converted into reserves. There are over 2,000 known manganese deposits in the United States. Some of these deposits are capable of producing 100,000 tons of ore per year, others will produce none."

Favors Construction Of Plants in South.

He said the Bureau of Mines had obtained valuable information on deposits in various states and improved methods for concentration of low grade ores.

"It is now proposed that these findings be placed in operation," Mills said. "Your agencies of government have proceeded to recommend the construction of beneficiation plants to handle low grade ores in several Southern and Western states. It is my hope these plants will soon be producing high grade manganese, and that their number will be greatly increased in the ensuing months so that this essential mineral may be stricken from the import list."

Mills suggested the government spend the necessary funds to speed investigations and building of beneficiation plants. He said the secretary of state informed him this country consumed 655,000 tons of manganese in 1939, of which 627,000 tons was imported.

50 Pct. Reduction Of Duty by U. S. in 1935.

He charged the steel industry "never manifested a desire that domestic production" of manganese should develop. Leaders of the steel industry, he said, opposed a tariff on manganese, although one was approved in 1922 and the duty raised in 1930.

However, Mills said, a 50 per cent reduction in the duty on manganese was agreed to by the State Department in 1935 in a trade agreement with Brazil, and Russia subsequently was permitted the same reduction.

"The effect of the agreement was to permit manganese concentrated with forced labor in Russia to enter our markets at a price less than manganese in this country could be concentrated," Mills said. "Mines, heretofore producing, were closed. They filled with water. The incentive for private investment ceased to exist. Experimentation was set back to such an extent it was rarely conducted by private industry."

For this reason, he said, the Bureau of Mines has carried on its work almost alone.

"In our war effort we are reaping great dividends because of government protection of steel production and its expansion," Mills said. "Equal benefits could have been derived from parity government protection of manganese production and its expansion."

Manganese Mill Near Glenwood Expands Operations.

Special to the Gazette. 3-3-42
Glenwood, March 2.—Following completion of an addition to its mine west of Glenwood, the Northwest North American Manganese Corporation will handle all types of custom ore, directors were told when they inspected the plant the past week. Officials said the mill will be the largest manganese mill in the nation. The company will handle ore through outright purchase or mill it on a tonnage basis.

Batesville

Plant To Be Small One

Gazette 3-5-42

Washington, March 4 (AP).—The War Production Board disclosed today that it had undertaken a vast program of manganese production from low-grade ores, involving construction of 10 new federally-financed plants in eight states, to bring the nation's output to a total of more than 600,000 tons annually. The United States produced only 40,000 tons of manganese last year. The ore is a necessary alloy in production of steel and aluminum.

William L. Batt, WPB materials director, announced that seven small plants and three large ones would be built. Newly developed methods of extracting high-grade manganese concentrates from 10 to 12 per cent ores will be used in the latter three plants, which are designed to produce more than two-thirds of the expanded domestic output.

They will be located in the Cuyuna range of Minnesota, the Missouri river area in South Dakota, and near Boulder dam, Nevada. The seven small ore dressing plants will be built in Arkansas at Batesville and in Montana, Nevada, Utah, Georgia and Tennessee.

Manganese shipments still are arriving from foreign ports, including considerable quantities from South America. All the new plants are expected to be in production next year.

Batesville Manganese Plant Ready Soon.

Gazette 3-8-42
Statehouse circles heard yesterday that construction of a \$1,000,000 manganese plant near Batesville will be started soon. It will handle 500 tons of ore daily.

Governor Adkins prepared to leave tonight for Washington to take up other state business with federal officials. Among the objects of his trip are:

1. To discuss with Robert E. Allen, deputy co-ordinator of the oil and gas industry, an order by Secretary Ickes to widen spacing regulations in south Arkansas. He may be joined later this week by members of the state Oil and Gas Commission, who will conduct a hearing on the spacing problem at El Dorado Tuesday.
2. To confer with Attorney General announced inquiry into the Arkansas parole system by the Federal Bureau of Investigation. This conference will be incidental to other business, he said.
3. To discuss the possibility of obtaining additional national defense industries for the state.
4. To offer facilities of the University of Arkansas to the army and navy for training members of the armed forces.
5. To discuss a proposed plastics plant that may be situated in south Arkansas.

Manganese Production In Increase

Special to the Gazette. 3-8-42
Cushman, March 7.—Production of manganese ore in the Batesville-Cushman field during February totaled 395 tons. The Walter H. Denison Manganese and Contracting Company shipped 105 tons of high grade, and 190 tons of low grade, and the Arkansas Manganese Company, about 100 tons. Jack Gibbons, head of the latter company, said that he already had loaded out more ore in March than his entire February output. The low output in February was due

largely to inclement weather.

Production will be much larger in March and will increase every month on account of the heavy demand now for the ore. Many new men are investigating the field. Some have bought or leased mining land, and will be producing soon. Much new prospecting is under way.

Forty New Prospect Shafts.

Forty new prospect shafts are being sunk by miners working on the Denison properties. This is probably the largest number of shafts ever sunk at one time in the history of the field. Many of them will wind up as producers.

Elmer Webb of Mountain View and Jean Deamer, Virginia Deamer and E. L. Clark of Springfield, Mo., will start sinking six drill holes on 120 acres near Penters Bluff. They have some good outcrops on the property but want to prove up a good deposit and start mining in a big way. The holes are being sunk on a fault and will go to a depth of approximately 130 feet.

Fred Livingston and Preston Grace of Batesville, who own a large acreage in the field, are sinking two new shafts on one of their tracts on Lafferty creek. Three shafts are in good high grade ore.

Processing Plant Proposed.

While reports show up almost weekly that a processing ore plant will be located at Batesville by the government, mine operators in the field have not been advised that it actually will be built or when it will be built or what kind of a plant it will be. They are anxious to get some definite information so they can prepare to mine sufficient ore for its operation.

The Electro Manganese Corporation of Knoxville, Tenn., which operates an electrolytic plant at that place, still is taking carbonate ore from the Batesville-Cushman field. They will take anything as low as 16 per cent for which they pay .31 per unit. Anything lower than that is not wanted, and operators have been warned not to ship unless they are sure of the grade.

The latest piece of modern equipment installed in the field is an automatic car loader of the belt conveyor type, which is in operation on the loading yard of the Arkansas Manganese Company at Cushman. Ore is dumped into the bottom of the contraption and is carried by it to the top of the freight car and dumped.

CURB VOTED ON

SPECULATION IN MINERAL LANDS

Monthly Rental Assigned.

Gazette 3-25-42

Action by state and federal officials yesterday which is expected to encourage Arkansas's manganese production:

To prevent free speculation on state-granted mineral leases, the Land Use Committee of the state Planning Board adopted a policy of leasing manganese recovery rights in tracts of 40 acres, at \$5 per tract monthly until production starts.

Congressman Wilbur D. Mills of the Second district announced that Donald M. Nelson, War Production Board chairman, was investigating the desirability of pegging the manganese price at \$1 per unit to stimulate production.

The House Appropriations Committee recommended increased expenditures for manganese, bauxite, alumina ore and aluminum clay investigations and surveys.

10 Per Cent Royalty To Supplement Rental.

After manganese production starts, the state would receive a 10 per cent royalty under its leases, but the monthly rental of \$5 per 40 acres would remain effective in lieu of the royalty, if it exceeded royalty returns.

Applications for manganese leases on 8,000 acres of state land in the Batesville area have been filed, Claude A. Rankin, chief appraiser of the Land Use Committee, said.

The Mineral Leases Subcommittee, which met following the L. U. C. session, commented:

"It is the opinion of the subcommittee that many of these applicants filed for much larger parcels of land than they could reasonably expect to mine in conjunction with their major operations, thinking there would be no rental fees charged on such land, thus enabling them to speculate on state granted mineral leases without cost to themselves * * *

Several applications had requested a lease on the same land, "the granting of any of which might cause unjust criticism of the committee and result in considerable confusion and loss to prospective operators."

10 Days Allowed For Execution of Leases.

The Mineral Leases Subcommittee, by resolution, recommended that Revenue Commissioner Joe Hardin immediately advise all applicants for manganese, zinc, lead and other mineral leases, regarding the committee's action. Mr. Hardin will ask whether they want the lease to be granted for lands described in their original application, under the new rental requirements. If he receives no reply within 10 days, the application will be null and void.

Applications involve land in Independence, Sharp, Izard, Stone, Lawrence, Marion, Boone, Newton and Searcy counties. Most of the prospective operators are residents of the areas, Mr. Rankin said. L. A. Watkins of Harrison, president of the Missouri & Arkansas railway, is the only applicant for a zinc lease.

The committee instructed its appraisers to start a valuation of timber on state land in national forest areas. The National Forest Service and private lumber companies have made offers to purchase the land. State Forestry Commission employees will assist the appraisers.

Increased Price For Manganese Said Needed.

At Washington, Congressman Mills said an increase in present manganese prices, for units of about 22.4 pounds, "is imperative to make it economically possible for many producers to increase production."

A \$1 price on 40 per cent manganese ore would amount to an increase of about 20 per cent over present prices, Mr. Mills said.

The WPB has recommended the establishment of a large manganese concentration plant near Batesville. It would concentrate about 500 tons of raw manganese ore daily.

A new Interior Department appropriations bill includes: \$1,517,570 for manganese beneficiation pilot plants and research; \$93,925 for continuing experimental work of producing alumina from bauxite, alumite ores and aluminum clay deposits, and \$498,500 for continuing a survey of new deposits of bauxite and aluminum clay deposits. The Bureau of Mines has started the research work.

Arkansas has been producing 97 per cent of the domestic bauxite supply.

Three Qualify For Manganese Leases

Democrat 4-5-42
Only three applicants for leases of state-owned mineral rights in manganese bearing land, have filed deposits as required under the manganese leasing policy recently adopted by the Land Use Committee of the State Planning Board.

The committee fixed 40-acres as a leasing unit and set monthly rental at \$5 per unit.

State Revenue Commissioner Joe Hardin, who makes the leases after approval of applications by the Land Use Committee, notified all applicants for manganese leases of the new policy and gave them 10 days in which to file the required deposit.

The 10-day period expires Monday.

Before the manganese leasing policy was adopted, applications for leases on about 5,000 acres of land believed to contain manganese, had been filed.

Mineral rights subject to such leases are in land which has forfeited to the state for non-payment of taxes.

BATESVILLE Enlargement Of Cushman Manganese Plant Planned

Democrat 4-12-42

Decision to increase the size of the manganese processing plant to be located in the Batesville area, apparently has been reached even before the definite site for the plant has been chosen, Governor Adkins said yesterday.

Information that the size of the proposed plant would be increased from 300 to 500 tons daily has been given Congressman Mills, the governor said. That, he added, apparently confirmed similar information he had obtained from another source.

It also was reported yesterday, but without confirmation, that a 100-octane gasoline plant might be located near El Dorado. Such a plant was in prospect several months ago. Hope for it dwindled, but according to reports heard yesterday, the project apparently has been revived.

Six applications for lease of state-owned mineral rights on manganese bearing land in Independence, Stone and Izard counties, have been approved by State Revenue Commissioner Joe Hardin.

Lease forms were not available, but the commissioner has written letters to C. S. Little, Little Rock; Farmers, Inc., Batesville; R. M. Allison, Little Rock; E. G. Hess, Manila; R. W. Sturch, Blytheville; and John Culp, Batesville, confirming approval of their lease applications.

The tracts leases ranged from 40 to 800 acres, the commissioner said. Overlapping applications were received on one 200-acre tract in Independence County and the commissioner has withheld action on those for the time being.

Under a recently adopted policy of the Land Use Committee of the State Planning Board, manganese leases are made at a rental of \$5 monthly for each 40-acre unit, and the rent will continue until production is such that royalty exceeds the rent.

Six Applications for Leasing Mineral Rights Approved.

Gazette 4-22-42
Revenue Commissioner Joe Hardin has approved six applications for leasing state-owned mineral rights on manganese land in Independence, Stone and Izard counties. Size of the tracts range from 40 to 800 acres.

Successful applicants thus far include: C. S. Little, Little Rock; Farmers, Inc., Batesville; R. M. Allison, Little Rock; E. G. Hess, Manila; R. W. Sturch, Blytheville; John Culp, Batesville.

The state Land Use Committee recently held that manganese leases shall be made at a rental of \$5 per month for each 40 acres. The rent will continue until royalties exceed it.

The Skvor Manganese Company has bought 3,000 acres of leases and fees and is getting into active operation. Its properties lie east from the Spring Mill, on the Batesville-Mammoth Spring highway, to Polk Bayou. The Greenfield, Roberts and other old producing properties lie in its holdings. It employs 58 men. Most of its operations are conducted with modern equipment with drag lines for stripping and air drills for hard rock or carbonate mining. James Woods, head of the concern, said the firm was operating on one vein of carbonate with a face about 200 feet wide and eight feet high that averages 30 per cent. The land was core drilled before actual mining operations were started.

The Skvor company will start erection of a beneficiating plant next week at a site on Spring creek near Spring Mill. Two units will be built first. Later 10 units will be added to the plant. Each unit will handle three tons of crude an hour. The process will be a leaching, washing, filtering and cintering process. The ore will be washed, leached, classified and cintered. The cintering will be done in a large rotary kiln.

Livingston & Grace of Batesville, who own a large acreage of manganese land in the field, are operating an several properties in the Lafferty Creek district.

Rain from after the first week in April until the end of the month delayed shipments. Approximately 1,000 tons on the Cushman ore yards, are ready for shipment when the moisture content dries out.

Interest in the field is increasing each week, and many leases and land titles are changing hands. Most of the buyers are from the North and East.

The big Midwestern smelting concern that plans to put in a plant in the field has a crew of men in the field collecting samples for testing purposes. This will consist of 12 sets of samples covering low grade ores, four tons to the sample or a total of 48 tons. There seems little doubt now that construction of this plant will start next summer.

Manganese Ore Price Increased.

Special to the Gazette. 5-10-42
Batesville, May 9.—Price of manganese has been increased to \$50 a ton for 48 to 50 per cent ore, mining companies operating in the new Cushman (Independence county) fields were notified by government mining officials today. Prices probably will be pegged at this figure, it was indicated.

Mining companies have been anticipating the increase for several weeks. Most of them have huge stock piles. The Hoxsey & Rogers Mining Corporation of Dallas, Tex., one of the larger operators, is said to have 1,000 tons ready for shipment. The firm owns about 1,000 acres in the mining district.

Eight or 10 large operators are in the field, and mining is being conducted on a large scale. Batesville and Cushman have taken on appearances of boom towns, with little hotel space available. The ore is being shipped to smelting centers.

Large Flume Being Installed In Manganese Field.

Special to the Gazette. 5-17-42
Cushman, May 16.—The Hoxsey-Rogers Company is installing one of the largest flumes ever installed in connection with manganese mining at the Batesville-Cushman field. The flume will be 1,700 feet long and reach from the producing shafts on top of the mountain at the Barksdale mine, into the valley. Ore will be dumped into the flume at the top and washed to the bottom. The flume will serve two purposes—convey the ore from the mine to the ore bins, and wash it during the trip. A water line is being laid along the side of the flume to supply the water. The Hoxsey-Rogers Company also is installing an office here. Mrs. King Rogers is office manager.

Manganese Plant May Go To Batesville

Democrat 5-17-42
Batesville — That a manganese processing plant will be built in the Batesville-Cushman field by private capital was announced here today by J. S. Henderson, St. Louis, who has spent some time here investigating the field.

Mr. Henderson did not reveal who his associates would be, but he is said to represent Eastern capital.

This plant would be independent of the ore processing plants promised by the government for this manganese field. The output of the proposed plant by Henderson and associates will be sold to the government and steel manufacturers.

Six hundred tons of low grade ore, which will produce about 200 tons of concentrates a day, was Henderson's estimate of the output. Preliminary operations may begin as early as June 1.

Gazette 5-20-42
LAND USE MEETING
Several applications for leasing state mineral rights on manganese land will be considered by the State Planning Board's Land Use Committee in the governor's reception room at the capitol at 1:30 p. m. Friday, Land Commissioner Bush Binley, secretary, said yesterday.

Manganese Plant Will Operate Soon

Gazette 5-23-42
Richard Anderson, acting state geologist, said yesterday the American Zinc and Lead Company of St. Louis will begin operation of a manganese plant that will handle 400-500 tons of ore daily near Batesville within two months.

Speaking before the Land Use Committee of the State Planning Board, Mr. Anderson said the plant

Enlargement Of Cushman Manganese Plant Planned

Democrat 4-12-42

Decision to increase the size of the manganese processing plant to be located in the Batesville area, apparently has been reached even before the definite site for the plant has been chosen, Governor Adkins said yesterday.

Information that the size of the proposed plant would be increased from 300 to 500 tons daily has been given Congressman Mills, the governor said. That, he added, apparently confirmed similar information he had obtained from another source.

It also was reported yesterday, but without confirmation, that a 100-octane gasoline plant might be located near El Dorado. Such a plant was in prospect several months ago. Hope for it dwindled, but according to reports heard yesterday, the project apparently has been revived.

Six applications for lease of state-owned mineral rights on manganese bearing land in Independence, Stone and Izard counties, have been approved by State Revenue Commissioner Joe Hardin.

Lease forms were not available, but the commissioner has written letters to C. S. Little, Little Rock; Farmers, Inc., Batesville; R. M. Allison, Little Rock; E. G. Hess, Manila; R. W. Sturch, Blytheville; and John Culp, Batesville, confirming approval of their lease applications.

The tracts leases ranged from 40 to 800 acres, the commissioner said. Overlapping applications were received on one 200-acre tract in Independence County and the commissioner has withheld action on those for the time being.

Under a recently adopted policy of the Land Use Committee of the State Planning Board, manganese leases are made at a rental of \$5 monthly for each 40-acre unit, and the rent will continue until production is such that royalty exceeds the rent.

Six Applications for Leasing Mineral Rights Approved.

Gazette 4-22-42
Revenue Commissioner Joe Hardin has approved six applications for leasing state-owned mineral rights on manganese land in Independence, Stone and Izard counties. Size of the tracts range from 40 to 800 acres.

Successful applicants thus far include: C. S. Little, Little Rock; Farmers, Inc., Batesville; R. M. Allison, Little Rock; E. G. Hess, Manila; R. W. Sturch, Blytheville; John Culp, Batesville.

The state Land Use Committee recently held that manganese leases shall be made at a rental of \$5 per month for each 40 acres. The rent will continue until royalties exceed it.

The Skvor Manganese Company has bought 3,000 acres of leases and fees and is getting into active operation. Its properties lie east from the Spring Mill, on the Batesville-Mammoth Spring highway, to Polk Bayou. The Greenfield, Roberts and other old producing properties lie in its holdings. It employs 58 men. Most of its operations are conducted with modern equipment with drag lines for stripping and air drills for hard rock or carbonate mining. James Woods, head of the concern, said the firm was operating on one vein of carbonate with a face about 200 feet wide and eight feet high that averages 30 per cent. The land was core drilled before actual mining operations were started.

The Skvor company will start erection of a beneficiating plant next week at a site on Spring creek near Spring Mill. Two units will be built first. Later 10 units will be added to the plant. Each unit will handle three tons of crude an hour. The process will be a leaching, washing, filtering and cintering process. The ore will be washed, leached, classified and cintered. The cintering will be done in a large rotary kiln.

Livingston & Grace of Batesville, who own a large acreage of manganese land in the field, are operating an several properties in the Lafferty Creek district.

Rain from after the first week in April until the end of the month delayed shipments. Approximately 1,000 tons on the Cushman ore yards, are ready for shipment when the moisture content dries out.

Interest in the field is increasing each week, and many leases and land titles are changing hands. Most of the buyers are from the North and East.

The big Midwestern smelting concern that plans to put in a plant in the field has a crew of men in the field collecting samples for testing purposes. This will consist of 12 sets of samples covering low grade ores, four tons to the sample or a total of 48 tons. There seems little doubt now that construction of this plant will start next summer.

Manganese Ore Price Increased.

Special to the Gazette. 5-10-42
Batesville, May 9.—Price of manganese has been increased to \$50 a ton for 48 to 50 per cent ore, mining companies operating in the new Cushman (Independence county) fields were notified by government mining officials today. Prices probably will be pegged at this figure, it was indicated.

Mining companies have been anticipating the increase for several weeks. Most of them have huge stock piles. The Hoxsey & Rogers Mining Corporation of Dallas, Tex., one of the larger operators, is said to have 1,000 tons ready for shipment. The firm owns about 1,000 acres in the mining district.

Eight or 10 large operators are in the field, and mining is being conducted on a large scale. Batesville and Cushman have taken on appearances of boom towns, with little hotel space available. The ore is being shipped to smelting centers.

Large Flume Being Installed In Manganese Field.

Special to the Gazette. 5-17-42
Cushman, May 16.—The Hoxsey-Rogers Company is installing one of the largest flumes ever installed in connection with manganese mining at the Batesville-Cushman field. The flume will be 1,700 feet long and reach from the producing shafts on top of the mountain at the Barksdale mine, into the valley. Ore will be dumped into the flume at the top and washed to the bottom. The flume will serve two purposes—convey the ore from the mine to the ore bins, and wash it during the trip. A water line is being laid along the side of the flume to supply the water. The Hoxsey-Rogers Company also is installing an office here. Mrs. King Rogers is office manager.

Manganese Plant May Go To Batesville

Democrat 5-17-42
Batesville — That a manganese processing plant will be built in the Batesville-Cushman field by private capital was announced here today by J. S. Henderson, St. Louis, who has spent some time here investigating the field.

Mr. Henderson did not reveal who his associates would be, but he is said to represent Eastern capital.

This plant would be independent of the ore processing plants promised by the government for this manganese field. The output of the proposed plant by Henderson and associates will be sold to the government and steel manufacturers.

Six hundred tons of low grade ore, which will produce about 200 tons of concentrates a day, was Henderson's estimate of the output. Preliminary operations may begin as early as June 1.

Gazette 5-20-42
LAND USE MEETING
Several applications for leasing state mineral rights on manganese land will be considered by the State Planning Board's Land Use Committee in the governor's reception room at the capitol at 1:30 p. m. Friday, Land Commissioner Bush Binley, secretary, said yesterday.

Manganese Plant Will Operate Soon

Gazette 5-23-42
Richard Anderson, acting state geologist, said yesterday the American Zinc and Lead Company of St. Louis will begin operation of a manganese plant that will handle 400-500 tons of ore daily near Batesville within two months.

Speaking before the Land Use Committee of the State Planning Board, Mr. Anderson said the plant

will be financed by the federal government but will be operated by the Missouri company. Low grade ore will be utilized. Stock piling will begin about June 1, he said.

Records of the state Revenue Department showed increasing activity in the Batesville area since the committee began leasing mineral rights under authority of a 1941 act, which cloaked Revenue Commissioner Joe Hardin with authority to make lease contracts.

Mineral Rights To 2,500 Acres Leased.

Mineral rights in about 2,500 acres in Independence county have been leased since April 3. Among those who have contracted to pay 12 1-2 cents an acre monthly rent are:

Farms, Inc., of Batesville, 828 acres.
John Culp of El Dorado, 40 acres.
C. S. Little of Little Rock, 160 acres.
R. W. Sturch of Batesville, 80 acres.
R. M. Allison of Batesville, 942 acres.
E. G. Hess of Sharp county, 700 acres.

E. C. Haase of Glenwood has leased 40 acres in the Pike county manganese field.
Dan W. Johnston of Clarksville has leased 130 acres for inclusion in a block of Johnson county land which will be drilled for gas. The price was 25 cents an acre.

Commissioner Hardin said lease holders will continue to pay monthly rentals until royalty exceeds the rent; then they will pay royalties only.

Ore Reduction Plant Planned In Cushman Field.

Special to the Gazette. 5-24-42

Batesville, May 23.—A representative of the American Lead and Zinc Company will arrive here in a few days to confer with factors in Manganese ore field looking to the negotiation of a contract to build and operate the large government-sponsored ore reduction plant in the Cushman field. The American Lead and Zinc Company would build and operate the plant with government underwriting the operation.

Poachers Raid State Owned Mineral Land

Democrat 6-5-42

Illegal severance of approximately \$2,500 worth of manganese ore from state-owned land will be reported to the Land Use Committee of the state Planning Board at a meeting on June 15 by Harve B. Thorn, chief appraiser for the Land Use Committee.

Until he makes his report to the committee, Mr. Thorn declined to reveal the location of the alleged illegal operations or identity of the operators.

He said, however, that approximately 70 tons of manganese ore, some of it high grade, had been taken from the mine.

A large amount of manganese bearing land in North Arkansas, to which the state owns mineral or both mineral and surface rights, has been leased by the Land Use Committee and state Revenue Commissioner Joe Hardin.

Appraiser Thorn said however, that the alleged illegal operation was located on a tract of land which had not been leased, and to which, according to his investigations, the state owns both mineral and surface rights.

The 1939 land policy act, which created the Land Use Committee, retains for the state all mineral rights to lands forfeited to the state for non-payment of taxes. Under a recently adopted policy, the state's mineral rights to manganese land are leased on a basis of \$5 per month per unit of 40 acres and at a royalty of 10 per cent. The monthly rental continues until production reaches a point where the royalty exceeds the amount of the rent.

Manganese development has been rapid in recent months since announcement of a proposed manganese processing plant in the Batesville area.

Manganese Removed From State Lands.

Gazette 6-6-42

Someone has been removing manganese illegally from state-owned land, Harve B. Thorn of the state Land Use Committee charged yesterday. Mr. Thorn said about 70 tons of the ore, valued at \$2,500, had been taken but he declined to disclose the location until he reports to the committee at its June 12 meeting.

Since plans for a manganese processing plant near Batesville were announced recently, develop-

ment of nearby deposits have been rapid. Mineral rights on some state-owned property in that area have been leased to individuals by Revenue Commissioner Joe Hardin under authority of a 1941 law.

Much Activity In Manganese Fields

Special to the Gazette. 6-7-42

Cushman, June 6.—While arrangements for construction of the big manganese beneficiating plant in the Batesville-Cushman manganese field have not been completed, there is no doubt that it will be built, American Zinc Company of Arkansas officials, who will operate it, said. They have been in the field for several days.

Robert Ammon, who will be the general manager of the plant, said: "I cannot say exactly when work on the plant will start, but it will be built as fast as possible, as our plans work out. We are also making arrangements to open an ore market in the field for soft black, or wad ore, sometime during the latter part of June."

Equipment for the beneficiating plant planned by the Skvor Manganese Company, operating the Newton Roberts, Stark Spring, Gray Hill and Greenfield mines, has been completed, and Jack Manning, now in charge of operations, said that construction on two units of the plant will start soon. It will be built near the Spring Mill, between Cushman and Batesville. June production of this company is expected to be four cars—two of high grade, one of low grade and one of carbonate.

Large Tonnage Shipped.

The Walter H. Denison Company shipped 190 tons of high grade in May. During the last two weeks it has opened seven new mines on the properties in the Pfeiffer district. It is also operating on the Southern Hill, near Cushman, and has opened another good dig on the Ozark.

The Arkansas Manganese Company, headed by Jack Gibbons, operating mines on the Aydelotte property, shipped 100 tons of high grade in May and is making a big production of low grade.

Sims Bros. of Cushman shipped a 47-ton car last month.

The Hoxsey-Rogers Company is making a good production on all its properties. It has completed a washer on the Tate mine that will handle from 35 to 50 tons of crude a day, and another on the Bell Hill that will handle around 50 tons. It also has completed a 1,700-foot flume and water line on the Barksdale. Other mines it is operating are the Marcus Miller, Mike Pugh, Tosh Hill and the Chin mine on Cave creek.

Ore shipments from the field started to slow up in May, practically no low grade being shipped. Operators are piling up their production of this grade on their ore yards, holding it until the latter part of June, for sale to the American Zinc Company of Arkansas, which will install the large beneficiating plant. There is now approximately 2,000 tons of low grade piled high on the ore yards. The company will build up a big stock pile while the plant is in construction, so it will have plenty of crude to supply the plant immediately it gets into operation.

Arkansas to Furnish Nation's Manganese

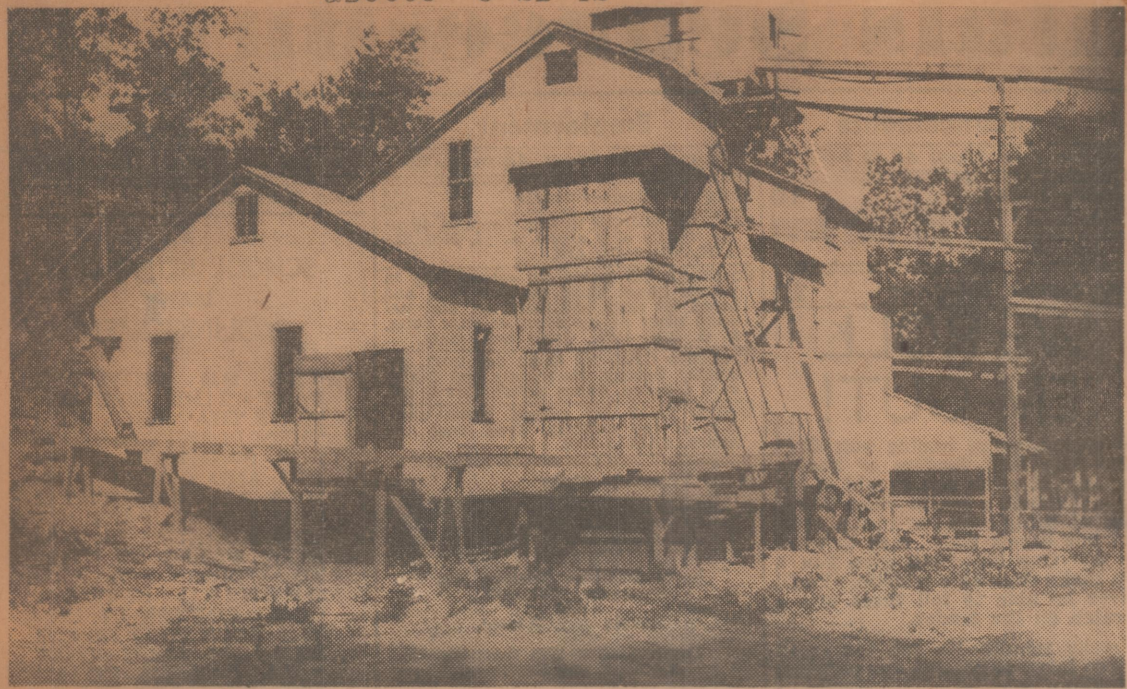
Democrat 6-21-42
Hot Springs.—The government definitely is now looking to Arkansas for the bulk of its manganese production and the state is producing.

An official of the Pike County mill of the North American Manganese Corporation, St. Louis, reported yesterday that the company, which is now preparing to double its present capacity, is already shipping 75 tons of concentrates per week to steel mills in the south and west.

The Arkansas mill, located west of Glenwood, has been producing since January 1 and is working on an 800-acre field in a vein which runs back 2,000 feet. It is said to be a superior grade of manganese, a product vital to steel production. Experts have estimated that the mill has 300,000 tons of the ore in sight.

The Pike County mill, said to be the only complete manganese mill in the South, employs 35 men. It is managed by E. C. Haase.

Until the start of the war the United States was producing not more than four per cent of the manganese it consumed. Nazi occupation stopped most of the foreign supply except that coming from Cuba and sufficient ships were not available to bring it from that island.



Mill of the American Manganese Corporation near Glenwood, Pike county.

Manganese Mill In Operation

Special to the Gazette. 6-21-42
Hot Springs, June 20.—Until the United States entered the war not more than four per cent of manganese consumed in this country was produced in the United States. The 96 per cent was imported from countries now dominated by the Axis, although Cuba produced a small quantity. Today the foreign source of supply is almost eliminated because of lack of shipping.

Manganese is an important factor in the manufacture of steel. The government is just awakening to the fact that the United States has an abundant supply. Near Glenwood, Pike county, is in operation the only complete manganese mine with all mill facilities to be found in the South.

The operating company is the North American Manganese Corporation, with headquarters in St. Louis. E. C. Haase is general manager. The company holds title to more than 800 acres, but only 120 acres are being worked. Mr. Haase said the company is getting the "cream" of the crop. He said the manganese vein has been traced 2,000 feet. The estimated tonnage of manganese is over 300,000.

Heavy Shipments Weekly.
The company is shipping 75 tons of concentrates a week. Ore goes to steel works in Southern and Western states. The company employs 35 men. To facilitate production, it was necessary to construct a railroad, which extends more than a quarter mile. Mr. Haase said the company plans to double production.

Prof. Hugh Miser of the United States Geological Survey visited the field and conducted an extensive survey recently.

"Arkansas don't seem to realize the minerals their state contains—minerals that no ware vital to the winning of the war," Mr. Haase said. "We have been operating since January and represent a new industry to the state. From what I have heard there will be several others, some of a different nature, but all of them producing valuable minerals. Arkansas is receiving more attention more attention from and consideration by men of science and industry than ever before."

Manganese Ore Fields Get Big Play

Special to the Gazette.
Cushman, July 4.—Work in the Batesville - Cushman manganese field has expanded rapidly the last 30 days, and production has increased appreciably. Weather conditions have been favorable for mining operations and more miners are being employed. June production was one of the largest ever made in the history of the field.

The American Zinc Company of Arkansas, of which Robert Ammon is general manager, has opened two ore markets, one here and one at Pfeiffer. Purchases are running approximately 100 tons daily, and the stock piles in the ore yards are building up fast.

"We started our drilling program this week and will employ 15 churn drill rigs soon," Mr. Ammon said. "The drilling will be done on the Denison and Gibbons properties. J. J. Inman of Joplin, Mo., formerly manager for the American Zinc, Lead and Smelting Company, in the Tri-State district, will be resident manager of the company. He will take over his new position here Wednesday."

Concerning the erection of the big beneficiating plant here Mr. Ammon said that "Several methods of treatment for soft black or wad ore are being considered. Construction will start on the plant when authorized by the Metals Reserve."

Much Ore Proved.
The company is buying soft black manganese ore, termed wad, turned out by local miners and others in the field. It is a low grade oxide and when dry most of it crumbles like clay. During the 18 months the Bureau of Mines spent in investigating the ore deposits of the field it proved up approximately 2,000,000 tons of this grade ore in an area about five square miles, which assures plenty of crude for a plant.

Besides mining operations, prospecting is being done in some parts of the field. Prospectors are at work in the southeast part of Saline county, and in Izard county, near Mount Pleasant, as well as in several sections in Independence county.

Big Production in June.
Total production in the field in June ran around 2,500 tons. The Walter H. Denison Manganese and Contracting Company shipped to furnaces and sold to the American Zinc Company 620 tons; the Arkansas Manganese Company, headed by Jack Gibbons, 1,250 tons, and the Hoxsey-Rogers Co., 220 tons, but

Gazette 7-15-42
This did not cover the entire production for the month. It has approximately 1,500 tons in its ore yard at Cushman and at the mines. Sims Bros. shipped 150 tons.

The Hoxsey-Rogers Co. is operating seven properties, the Bell Hill, Marcus Miller, Barksdale, Tosh Hill and Jess Melton. Mrs. King Rogers, office manager for the company, said it is possible to mine 100 tons a day from the Bell Hill. It is producing everything from low grade to high grade.

Charles Sims of Sims Bros. said that his firm is making a good production of ore from the Keney mine, near Pfeiffer. Three cars have been shipped during the last 30 days. It is mining high grade oxide, wad and nugget ore.

Deep Shaft Sunk.
Miners on the Club House mine, one of the Denison properties, have sunk one of the deepest shafts in the field. They went down 130 feet and have struck some good runs of ore and are making a good production.

During June the Aydelotte property, operated by the Arkansas Manganese Company, was the largest producer in the field. It is taking wad ore from shafts that run from 50 to 90 feet deep. New shafts are sunk into ore every week.

Fred Livingston and Preston Grace, operating in the Lafferty Creek district, will start soon to expand their operations. They now have two shafts into rich high grade ore.

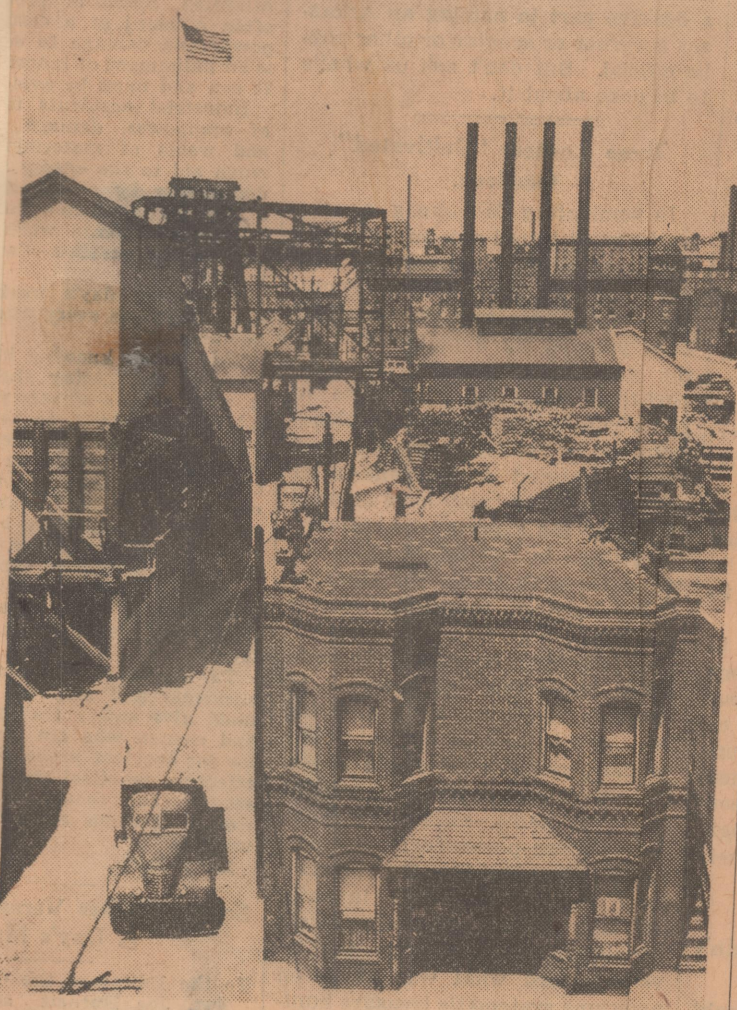
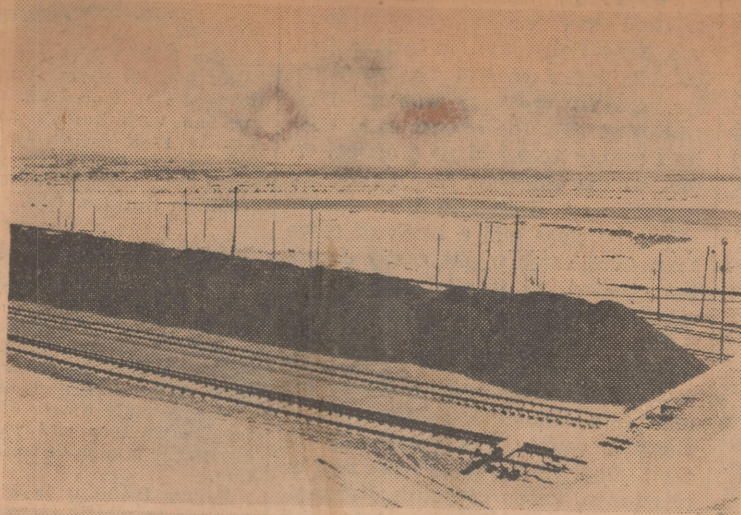
Mr. Livingston said that the Metals Reserve had leased ground near the Missouri Pacific station at Batesville for an ore yard, and will start buying ore soon that runs from 35 per cent up. It also has rented office space in the D. D. Adams & Son building.

A branch of the Bruce Williams Laboratory of Joplin, Mo., has been established at Batesville to assay the ores of the field.

Gazette 8-2-42 INCORPORATION MATTERS.

The Batesville Manganese Company filed incorporation articles at Secretary of State C. G. Hall's office yesterday listing authorized capital stock of 20 shares having no par value and original capital of \$500. Incorporators are Jon Gibbons, Melvin K. Reese and Max Papper, all of St. Louis, Mo., one share each, and John H. Harter, Batesville, resident agent, one share.

MANGANESE FOR WAR



—Wide Wo Photo.
That great black pile in the upper picture is manganese nodules, the pure stuff that's used in making steel, now sorely needed by our steel mills for war production. There's 750,000 tons of manganese here awaiting shipment east. In the distant background that's an old slab dump which is now being refined to exact the last ounce of copper.

The Emma Mine, fabulous manganese producing mint Butte, Mont., is located right in the heart of downtown Butte (see picture). An alley divides the mine itself. The manganese ore is hauled to the smelters by trucks. In this picture, several trucks can be seen in the alley—one has just received a load of the ore—the other is just driving up for its load.

Cinderella Mine Finds Her Slipper

But other opportunity to say they were not in time and not leave the Germans in this thing through to the end though, is deep and undying purpose to slay ruthless Huns, but we believe the lies to sweep through Germany lies no purpose on the part of the face and peace the world. They of man military effort of G's of defeat in Germany minds about military feel sure that no question will Points and the first World War. But no matter about the Fourteen of a just and stable peace. Given him seeking to lay the found sincerity and with vision that was understood and employed. He was in agandas as that word is generally ity of nations were in no sense proposals for the rights and second mir only call all. Woodrow Wilson of down to what Americans would co of the post-war German mind con Fa All this elaborate rationalization based on revenge or retribution. in armistice and hope for a peace of support there was nothing for tag Generals to do except beg for be size to win, so that without the the people had no longer felt the not inevitable. They contended the not just and that their armies w in to believing that their cause was unprepared for that sort of at to Germany, and had misled a peo atly deceptive propaganda to cel in to argue that the Allies, with W. millitairists and the Nazi political in the events which followed Versa dent's "sharply poisoned points" and the rest of the American ph nants, national self-determination for peace based on justice, open co led the German people into long "tic" of Woodrow Wilson, which to a "diabolical" weapon" empl to attributed, not to war weariness, at home. This collapse of morale the back" by the spread of defeat tary sense, but had been "stabbed had not been defeated in a true n booklet, was that the German arm a Columbia University "home to essor Carroll C. Pratt writes in "I Ludendorff and others fell back, I The explanation on which Gen illusioned nation?

nouncing Germany's military del affairs to be accounted for to a to the world. How was that state

MAGNESIUM PLANT BUILT ON

Unique Metal Factory Cost 100 Millions

Las Vegas, Nev., Nov. 21 (AP).—

Located in a blistering southern Nevada desert, where a year ago there was no water, no power and only a few houses, a gigantic plant, Basic Magnesium, Inc., already is producing the precious metal and an equally essential chemical, liquid chlorine. Without the energy generated by Boulder Dam, 15 miles distant, and the water it impounds, the magnesium plant could not exist. But just as important are Nevada's vast deposits of magnesium ore, close at hand.

A chemist with apparatus a yard square can make magnesium, but producing it in quantities required for global war is something else. Basic magnesium, while only one of numerous such plants, as the largest of them all, represents a new triumph of American ingenuity and inventiveness.

It cost more than \$100,000,000, required 50,000 tons of structural steel, and has the largest single electrical installation in the history of American industrial construction. It employs nearly three times Boulder Dam's maximum working force, housing it in a new model village of 1,000 demountable homes, a camp accommodating 6,000 single men, trailer camps, motor courts and hotels and homes in Las Vegas, 15 miles away.

Children attend a new 12-grade school. The sick are treated in a new concrete hospital. A restaurant, large enough to seat 2,200 persons, serves 25,000 meals a day.

Tremendous Production.

It was necessary to bring power and water over the mountains to the plant site. Hills were straddled to carry the electricity generated at Boulder Dam. A huge pipe line brought water from Lake Mead to two huge new reservoirs. A 26-mile railroad and 50 miles of temporary dirt road were built.

Basic Magnesium, Inc., soon will produce 30 times as much magnesium as did the entire world six years ago.

Magnesium, although eighth in abundance among the elements, does not exist in a free state. It was discovered in 1808, and first separated into the pure metal just before the turn of the century. But as recently as the 1920's work with the metal scarcely had passed the laboratory stage. Now that it can be produced in quantity, its value to our war effort is incalculable.

Magnesium is used for tracer bullets, flares and incendiary bombs. Because it is so extremely light—lighter than aluminum—it is used in alloys wherever possible, in airplanes, engines, wings, fuselages, mountings, gas tanks, panels, flooring, wheels, ventilating ducts, dust covers, to name a few. It has become the miracle metal of the war.

Production Process Simple.

There is no mystery about producing magnesium. In simple terms, it is the transformation of a oxide into a chloride, and the passage of an electric current through the chloride. Magnesium and chlorine are the result.

The magnesium oxide is mined and concentrated in a Nevada desert valley and shipped to the basic plant, where it is ground, mixed with coal, peat moss, salt and a few other substances, and molded into pellets the size of walnuts or small bricks. These are placed in kilns and dehydrated, then melted in a large cylindrical furnace into which a stream of pure chlorine gas is injected.

The result is a molten mass of magnesium chloride which is tapped off and placed in electrolytic cells resembling large tiled bathtubs. A strong electrical current is passed through the mass; this causing the molten magnesium to separate from the chlorine and come to the surface where it is ladled by hand.

Ordinarily copper would be used to carry the powerful electrical current through the molten magnesium chloride, but because there is an acute copper shortage (copper makes the best shell casings and we're making a lot of shell casings) it was necessary to find a substitute. It turned out to be silver—1,600,000 pounds of it—in planks fabricated in Baltimore. At 71 cents an ounce, that's better than \$18,000,000 worth.



The huge working force of Basic Magnesium's gigantic plant in the Nevada desert is housed in a new model village of 1,000 demountable homes (upper left), a camp accommodating 6,000 single men, trailer camps, motor courts and hotels and homes in Las Vegas. Peat, ingredient in manufacture of magnesium, is stored on the grounds (upper right). The beds, highly inflammable, are constantly watered as a precaution

In peacetime, use of silver for such a purpose wouldn't make sense. In an all-out war when it frees copper for shells it does make sense, particularly when such non-consumptive use does not impair the value of the sterling.

Thus silver comes out of the vaults, back to the state where it was mined, to help the battle for freedom.

against fire. B. M.'s layout includes a large plant in the world (lower left), chlorine being a by-product in the making of magnesium. Arline Foster (lower right), page girl in the plant, poses with a "cheese" of magnesium, an incendiary bomb and other objects made of the precious metal which is used for tracer bullets, flares and in light alloys wherever possible.

coffee.

The rivers played a tremendous part in the development of Arkansas. In earlier years the Arkansas, the White and other streams furnished the main means of transportation. The federal government used the Arkansas river to move troops and supplies to army posts in what is now the state of Oklahoma. Gen. Zachary Taylor was one military passenger. And old time river men were resourceful in meeting the difficulties caused by widely varying stages of water. Joe Curtis, the veteran river editor of the Memphis Commercial Appeal, heard the late E. W. B. Nowland tell of seeing water so low in the Arkansas that boats had to be "walked" across some of the sandbar reefs. Spars were placed out in front with one end fastened to the boat and the other shoved into the sand. Other spars were similarly fastened astern, slanting in the same direction as the timbers in front. When the stern wheel was started the spars lifted the boat over the bar into deep water. But human ingenuity sometimes met more than its match, and then Little Rock's "most fashionable homes" might have to eat cornbread. It took the coming of the railroads to end such transportation uncertainties.

The Germany That May Rise From The Ruins of War.

With the war going against the Axis from North Africa to the Solomons there are reports in London that a strong group of German generals, including Brauchitsch, Bock and Rundstedt, have joined in a movement to sacrifice Hitler and the Nazis and gain a peace favorable to their own class.

It is said that in the event of a stalemate the members of this junta would hope to be able to get rid of Hitler and perhaps form another government. If Germany is defeated they would hope that their class would be accepted by the Allies as the nucleus of a new government.

Hitler and the Nazi gang must be eliminated, but so must the military caste now reported to be talking about eliminating Hitler. So long as Prussian militarism holds the power it has traditionally held in Germany the world will be exposed to the catastrophe of war. It might indeed be considered an assurance of war in the future if the military power were left on top at the end of this new war or even left in position to build up in time another army with new and more terrible tools of slaughter and destruction.

This war may be ended, or at least the future of Germany may be determined, not by the Nazis or by the generals but by a revolution of the German people. A second overwhelming defeat within 25 years, the accumulated effects of some 10 years of sacrifice and privation and bitter mental and physical suffering, the material destruction and national

Bad Weather Cuts Output Of Manganese

Gazette 12-6-42

Special to the Gazette.
Cushman, Dec. 5.—Bad weather in November reduced the production of manganese ore in the Batesville-Cushman field to about 1,800 tons, most of which was wad or low grade. It was bought by the American Zinc Co. of Arkansas, and went into the big stock piles at Cushman and Pfeiffer.

A ceiling price has been placed on the ore which has hampered the production of high grade. In some instances it has lowered the price about \$10 a ton. This is due largely to the low phosphorus content demanded by the government agency that controls the buying. Furnaces now have to comply with the specifications when they buy the ore. Some local producers believe that the dollar a year men in Washington, whose companies own manganese properties in Cuba and Brazil, have their rough heels on the Batesville-Cushman field, and are demanding an investigation of the situation. The phosphorus content in the ore has never hampered production in the field before.

Robert Ammons, head of the American Zinc Company of Arkansas and who has headquarters in St. Louis, was in the Batesville office this week. The firm is operating 20 drill rigs in the field to work out potential tonnage. Mr. Ammons said that his purchase of wad for the past month has been about an average.

Field's Biggest Producer.

The biggest producer in the field in November was the Arkansas Manganese Company, headed by Jack Gibbons of Cushman. This concern operates the Aydlotte property, and its November production ran up to 781 tons, of which 45 tons was high grade, the rest wad. It is sinking three new shafts on the property which has been its monthly average for several months. Its production of wad ore was sold to American Zinc of Arkansas.

The Walter H. Denison Manganese and Contracting Company produced 700 tons in November, most of which was wad, and was bought by American Zinc of Arkansas.

Charles Sims of Cushman is

maintaining steady operations at the Kelly mine in the Pfeiffer district. He produced 50 tons of high grade in November.

New Operation Under Way.

The White River Mining Company, headed by J. M. Loomis of Kansas City and Ed Grigsby of Heber Springs are getting their mining operations well under way on Lafferty creek. They are operating on a 120-acre lease which they obtained from Livingston & Grace of Batesville. They have installed a compressor and air drills and are driving a tunnel and sinking several shafts.

A. H. Coleman, in charge of the manganese buying depot for Metals Reserve, at Batesville, said that purchases are running very low.

S. Reele and Grover Hart of Dallas, Tex., have taken over the Martha Thompson property in the Pfeiffer district. They have five shafts running from 12 to 55 feet deep. Their November production was 150 tons of wad that ran around 30 per cent.

The Southern Mining and Manganese Co., headed by Berry Fitzgerald and associates of Batesville, is getting its new concentrating plant into operation. It is located on the bayou, about five miles from Cushman. It recently installed sand jigs to take care of fines. The ore concentrated at the plant is coming from the Southern Hill and Polk Southard. The ore that comes off the plant is classified as coarse, fine course and fine. It is the only plant of its kind ever installed in the field.

The Enos Linsey Cave property, in Stone county, operated by E. M. McGary, Stanley K. Bourne and A. H. Bohn of St. Louis, with headquarters at Batesville, will get into production in two weeks. The property is three miles north of St. James. Operations are being carried on in the big cave. The company is installing a hoist, compressor and air drills.

Manganese Operators Bitter

Gazette 1-10-43

Special to the Gazette.

Cushman, Jan. 9.—Production of high grade manganese ore in the Batesville-Cushman field, which takes in parts of Independence, Izard and Stone counties, practically has stopped. Production of low grade will stop as soon as the Metals Reserve withdraws from the market. The production interruption of high grade is due to the ceiling price and specifications placed on the purchase of this ore by the government agency that controls it.

Most of the active operators in the field hold to the opinion that the specifications were maneuvered by dollar-a-day-men connected with some of the big steel companies and other companies, to close down production in the field. It is said that these concerns own or control large deposits of foreign ore, and that they would rather import than buy domestic ore.

Cause of Stoppage.

The government specification covering the phosphorus content in the ore stopped production of high grade. The field has been producing 75 years, and no operator in recent years ever has had any phosphorus penalties applied to his production by any furnace. Phosphorus content in ore mined in the field averages .45. The specifications of Metals Reserve call for a maximum of .5 phosphorus content, with heavy deductions on ore carrying phosphorus content up to that point. They will buy no ore with a phosphorus content running over this point. All ore now sold to the government has to conform strictly with this specification.

The ceiling price on ore sold to the government running 48 per cent is \$1 per unit, or \$48 a ton. If sold to the furnaces it is 35 cents per unit or \$40.80 per ton. The deductions on this grade ore carrying phosphorus content up to .45 average in the field is \$16.80 per ton, which brings the government price down to \$31.20, and the furnace price down to approximately \$24. Owing to the high price of labor, supplies, equipment, etc., it is impossible to produce high grade ore at a profit at these prices, operators said.

It is apparent that if 45 per cent phosphorus in manganese ore mined in the field has not resulted in penalties for phosphorus content in recent years there is something vitally wrong with the present specifications, it was said. Because manganese ore from the Batesville-Cushman field is high in lime and low in silica, which makes it self-fluxing in a steel mix, most phosphorus damage if any exists, is eliminated. If the phosphorus content in the specifications was changed from .5 to .8, production of high grade would continue.

Investigation Requested.

Manganese mine operators in the field are now asking Arkansas senators and congressmen to investigate thoroughly the situation and correct it. Manganese ore is a strategic war ore. In the last decade thousands of dollars have been made in the field by old and new operators. If the present specifications are correct, this will be a terrific blow to the war effort, as manganese is classed among the most important minerals needed to win the war.

Operators

Operators in the field are now asking Arkansas senators and congressmen to investigate thoroughly the situation and correct it. Manganese ore is a strategic war ore. In the last decade thousands of dollars have been made in the field by old and new operators. If the present specifications are correct, this will be a terrific blow to the war effort, as manganese is classed among the most important minerals needed to win the war.

Reports At Variance.

When Metals Reserve took over, it engaged the American Zinc Company of Arkansas, a subsidiary of the American Zinc, Lead and Smelting Company of St. Louis, Mo., to recheck the ore deposits and if they proved out, to mine, process and buy the ore.

Their report, which was submitted to Metals Reserve in December, was not released locally, but a letter from Congressman Wilbur Mills to a well known mine operator in the district, received a few days ago, said, in part:

"The reports which I have seen and which have been prepared by the American Zinc Company of Arkansas, indicate conclusively that there is not anything like the amount of low grade ore in your vicinity that was indicated by the earlier report filed by the Bureau of Mines. The report indicates that over a period of six years it might be possible to obtain 225,000 tons of low grade manganese at a cost of \$10,000,000. The officials, with whom I have discussed the matter say that the manganese situation today does not justify the purchase of ore at this cost per unit."

The two reports of ore deposits, one from the Bureau of Mines, 2,000,000 tons, the other from American Zinc, 225,000 tons, sum up as follows: two million tons minus 225,000 tons, equals 1,775,000 tons. In other words, the American Zinc's findings were 1,775,000 short of the Bureau of Mines. American Zinc did its test work with churn drills. The holes were too small for a man to descend and check the walls and floor. Because the Bureau of Mines and the United States Geological Survey are two of the most accurate and efficient departments in Washington, and because of the average monthly production of low grade wad, local mine operators accept the Bureau of Mines report.

40,000 Tons Produced Annually.

For the past six months the Batesville-Cushman field has been producing at a rate of approximately 40,000 tons a year, which is actually more per year than the American Zinc reports indicates might be produced over a six-year period. If local operators were assured of a steady market for low grade wad, at the price now being paid, with no red tape or bureaucratic interruptions, the 1943 production probably would run much higher than this.

The American Zinc Company's estimate of a possible production of 225,000 tons in six years, at a cost of \$10,000,000, would equal \$44.44 a ton for low grade ore. This probably includes the cost and installation of equipment and is estimated on dry ore basis. This same company now buying ore in the field for Metals Reserve is paying approximately \$7 or less per ton for wet ore, same quality, or figured on a dry basis, approximately \$10.50 per ton, or one-third more. Their estimate of \$44.44 a ton would be \$37.40 more than they are now paying per ton for wet ore or \$33.94 more for dry ore. In viewing these figures, operators also include in the picture, the purchase and installation of their own equipment, which they paid for.

The cost per unit is based on the 225,000 tons, which would cost \$10,000,000 to mine, or \$44.44 a ton. The plant was no doubt turned down because of these figures. But local operators say they would not have had to pay such a price for ore to supply the plant. They can supply all of the ore any beneficiating plant would consume at or about \$7 for wet or \$10.50 for dry, which the government is paying now.

Local operators says that the present situation has developed, either through ignorance on the part of Washington or by conspiracy on the part of their dollar-a-year advisers. Either deduction, unless something is done by authorities in Washington will destroy the field, they said. Destruction of the field at this time would be a terrific blow to the war effort, as manganese is classed among the most important minerals needed to win the war.

Gazette 5-18-43

LARGE MINING OF MANGANESE BEING HELD UP

Norrell Critical Of Program Delay.

(By the Associated Press.)
Washington, May 17. — Bauxite, manganese, coal, diamonds, quartz — Arkansas minerals passed in review during congressional hearings on the Interior Department appropriation bill, the record of which was made public today. The mass of testimony, covering dozens of printed pages, brought forth not

only glowing reports on the state's mineral wealth, but also declarations that it ought to be taken out of the ground faster.

Representatives Norrell (Dem., Ark.) and Jensen (Rep., Ia.) charged that efforts are being made to prevent the development of manganese mining in Arkansas and other states. Norrell criticized curtailment of manganese operations in the Batesville (Ark.) area.

D. F. Hewett, chief of the Metal Section of the United States Geological Survey, testified the Arkansas ore is of a high grade, but that plans for installing a mill there were stopped by the War Production Board because "I am told" — the manganese crisis has passed. Hewett said large quantities of manganese ore are being brought from Africa and India in ships that otherwise would have returned empty from the war zones.

Representative Fitzpatrick (Dem., N. Y.) asserted that the cost of importing a ton of manganese ore has jumped from \$6.50 or \$7 to \$22 and \$23 — and "somebody must have been making an awful profit." He suggested an investigation.

Norrell said: "Frankly, I am of the opinion that efforts are being made to prevent the development of these projects, and especially do I believe this is true with reference to the discontinuance of the construction of the project at Batesville. They started developments in a big way, and then all at once they changed their opinions and said they did not need it."

Charges Big Companies "Using" U. S. Agencies.

Jensen commented: "The truth is that there is a bunch of these big companies that have interests of that kind all over the world, and WPA and Board of Economic Warfare, and all the rest of the departments of the government, are being used by them."

Jensen charged that powerful interests in this country who have interests in foreign metal mines "are doing everything possible to keep us from developing our own natural resources, even in wartime at the expense of our government and possibly at the expense of American boys' lives and the lives of our allies."

Would Process More Bauxite in Arkansas.

The Geological Survey handed the committee a report on its field studies, saying that the existence of large manganese deposits near Batesville has been proved, and that "these reserves constitute a known source of manganese whenever national requirements demand the systematic development of ores of the grades that exist there."

E. W. Pehrson, chief of Economics and Statistics Service, Bureau of Mines, said that in March, 1943, Arkansas produced 97.3 per cent of the bauxite produced in the United States.

Dr. R. S. Dean, assistant director of the Bureau of Mines, said there are about 60,000,000 tons of bauxite and alumina — bearing clay "that we know of" in Arkansas, and that about 16,000,000 tons of this represents bauxite of a grade that can be used in existing plants or plants now under construction. New processes are being developed, several witnesses said, for extracting alumina from the lower grade bauxite and from clay. G. F. Loughlin, chief geologist of the Geological Survey, said:

"The present demand for aluminum and the prospect that there will be for aluminum a much greater demand after the war than there was before, and the relatively small reserves of bauxite, which are mainly in Arkansas and are supplemented in a minor degree by bauxite in certain other Southern states, makes the low grade bauxite and the clays the coming material from which, so far as I can see, aluminum must be extracted after a while."

Norrell expressed a desire that more of the Arkansas bauxite be processed in Arkansas instead of being shipped to other states. Arthur E. Goldschmidt, acting director of the Division of Power, and Dr. Paul J. Raver, administrator, Bonneville Power Administration, admitted the idea was sound.

Quartz Crystals, Diamonds, Among Arkansas Minerals.

Other Arkansas minerals were discussed as follows:

Quartz crystal: Arkansas and California are the only two states commercially producing quartz crystal, which Loughlin testified has become "perhaps the most urgently needed strategic material." It is used in two-way radio sets. The Geological Survey has two parties in Arkansas now in connection with quartz crystal, all of which until recently came from Brazil. Hewett said he would expect Arkansas to make "a small but noteworthy contribution" to the more than 2,000 tons of crystal the army hopes to get in 1943.

Diamonds: Dr. Dean said, "I do

not think anybody" knows the extensiveness of Arkansas' diamond deposits. He said Arkansas is the only state where diamonds are found, but that no government department has ever made an extensive investigation of the diamonds there. Loughlin said the Geological Survey would make an exhaustive study of Arkansas diamonds "if called upon by the WPA."

Coal: Dr. A. C. Fieldner, chief of the Fuels and Explosives Service of the Bureau of Mines, said the coals of Arkansas and Oklahoma are the logical sources for coking coals for the Texas coke ovens and also for general industrial use in Missouri.

"There is a real shortage of bituminous coal in the district around St. Louis and Kansas City," Dr. Fieldner said, "which logically should be supplied from the territory. There is a demand for this coal and a need for help-

ing the operators to increase their production."

Norrell asked Dr. Fieldner about lignite, a type of coal between peat and bituminous coal. Fieldner replied that the lignite reserves of Arkansas are estimated at 90 million tons, but—

"You have, however, so much high-rank bituminous coal that I should think the development of the lignite deposits would be rather slow."

Seeks Local Capital To Finance Mines.

Commenting on charges made by Congressman W. F. Norrell of Monticello in Washington yesterday that efforts have been made to keep the federal government from assisting in development of minerals in Arkansas, state Geologist Joe W. Kimzey said his office is making a strong bid to promote zinc and lead mining with private capital after receiving little encouragement from federal agencies.

"This office is making a strong effort to set up buying and stock piling facilities to promote movement of the high grade zinc ores of North Arkansas, having asked the War Production Board and the Metals Reserve Company for help along these lines," he said.

"After receiving little encouragement from these sources, however, we have succeeded apparently in interesting local capital to underwrite such undertakings."

Mr. Kimzey said tentative arrangements have been completed for opening an assaying and buying office in Harrison within about two weeks to stimulate activity of small operators in the North Arkansas zinc and lead fields. It will be financed by local capital.

The assaying office will permit these operators to stay in business until the Metals Reserve Company establishes a proposed stock pile, he said. In the past small mining operators have been unable to sustain themselves until they could develop their fields.

"In reference to Mr. Norrell's quoted opinion that efforts have been made to prevent development of certain projects in minerals in Arkansas, my conclusion, based on information bearing on the lead and zinc fields, is that similar interest in an important role in the development of these fields," he said.

"It is hoped that various sectional committees are looking at the phases indicated, they will overlook possibilities of ulterior influences which may be finding it more desirable to keep Arkansas zinc out of production at this particular time than to allow it to come into competition with better controlled ores of other states."

To Pay More For Manganese Ores.

Washington, May 17 (AP).—The Metals Reserve Company will pay increased prices for domestic manganese ores to stimulate production, Secretary of Commerce Jones announced today. The new price scale provides for increases ranging from 15 to 25 cents per unit.

Jones also announced a new schedule for domestic chrome ores which was described as a "readjustment" of prices.

Manganese Production On Increase

7-11-43 Gazette

Special to the Gazette.

Cushman, July 10.—Production of manganese ore in the Batesville-Cushman manganese field for June ran approximately 500 tons, most of which was high grade ore and was marketed at Metals Reserve Buying depot at Batesville.

Since the phosphorus content in Metals Reserve specifications was lowered, most of the high grade produced in the field is being sold to it. I. C. Watkins, buying agent, has taken over the old baseball field on the Roy Jeffery property, and is using it for ore storage. He has installed a small ore sample crusher to reduce the size of the samples before they are assayed.

New Beneficating Process.

George Weigart, who designed and built the Batesville White Lime Company's plant at Limesdale, has worked out a beneficating process for low grade carbonate and wad ores. It is a combination of a calcining and sintering plant and will beneficiate both grades of ore successfully. The same kind of plant has been in operation on manganese carbonate in Montana 20 years. The finished product is a button sintered ore.

The Walter H. Denison Manganese Company of Cushman was the largest producer in June. Its total production was 225 tons, mostly high grade. It now is operating five shafts on the Ozark property which it bought a month ago.

Charles Sims of Cushman was second in production in June, with 90 tons, including 50 of high grade. The ore came from diggings on the Kelley and Turner properties. Production from the Turner property will increase this month.

The Arkansas Manganese Company, operating the Aydelotte property near Cushman, produced 83 tons of high grade during June. Jack Gibbons heads the company.

McGee & Little, operating the Gray Hill mine, made a production of 10 tons of high grade during June. It has its sintering plant at Batesville practically completed.

Preston Grace and Mr. McGee have taken over Consolidated Mining Company's properties on Cave Creek, including the Chin and other mines.

The Southern Mining and Manganese Company, headed by Herman Miller and B. W. Fitzgerald, operating the Southern Hill mine near Cushman, produced 45 tons of high grade in June. It also operates a concentrating and washing plant on the bayou, near Cushman. It is a pilot plant. The company will start work soon to enlarge it.

Stroud and Bourne of Batesville are sinking two shafts on the Moser property near Cushman, and have encountered some good ore.

Concentrating Plant Opened.

Par-Mar Engineering Company, operating on Lafferty creek, west of Cushman, started its big concentrating plant Monday, and is now in production. Maxin Cohen is working manager, James Woods, operating engineer, and Stanley Hanford, superintendent. Mechanically its operations are the largest ever started in the Batesville-Cushman manganese field. Operations are conducted with two large hydraulic nozzles which gouge out the ore-bearing dirt at the rate of 100 tons an hour.

V. C. Johnson and associates, operating a power shovel on the Southern Hill property near Cushman, have encountered some good runs of ore. They also will do some churn drill prospect drilling.

Operations in the Lafferty creek area are hampered by bad road conditions.

Manganese Production At Year's Peak

Gazette 9-5-43

Special to the Gazette.

Cushman, Sept. 4.—Manganese production ran around 745 tons of high grade in the Batesville-Cushman Field in August, one of the best months for production of high grade in the field during the past year. Several new plants are under construction.

Most unusual strike made in the field the past six weeks was on the Austin property, near Mt. Pleasant, Izard county, operated by Ernest Stroud and Stanley Bourne of Batesville. In one shaft down to 72 feet they have cut through 36 feet of pyrolusite, a manganese ore used for chemical purposes. It is the largest run of this class ever found in the field. Operators are preparing to start shipments soon. They have about 10 tons of the dump.

Metal Reserves Buyer Transferred.

I. C. Watkins, who directed the Metals Reserve Buying Depot at Batesville for several months, has moved to Washington. Maj. F. D. Ruggles is now in charge of the depot. The phosphorus specification on high grade has been raised from .18 to .35 to provide a wider market.

Preston Grace and Marshall McGee of Batesville, who took over the Consolidated Mining Company's properties on Cave Creek, have completed their 300-foot production tunnel on the Chin mine, and are in good second grade hard ore that runs around 40 per cent. During the past 30 days their production ran to 50 tons.

Par Mar to Operate Kelley Mine.

The Par Mar Engineering Company, operating on Lafferty Creek, and Cave Hollow, has taken over the Kelley mine in the Pfeiffer District. Operators are building a pilot plant on the bayou at Batesville to work out and concentrate the ore. The plant will be in operation soon. James Wood is operating engineer and Max Cohen work manager. They produced 70 tons of high grade ore in August.

The E. and A. Mining Company, operating on the bayou, four miles northeast of Batesville, has installed a big pump and is mining with hydraulic nozzles. The company also has a concentrating plant under construction. James Wood is operating engineer.

Charles Sims of Cushman, who is operating the Turner property near Cushman, produced 50 tons of high grade ore during the last 30 days.

Denison Company Production High.

The Walter H. Denison Manganese Company, operating several properties in the field, was the largest producer in August. Total production ran 396 tons, most of which was high grade ore. The production was made from properties in the Pfeiffer District.

The Arkansas Manganese Company, headed by Jack Gibbons of Cushman, was the second largest producer in the field in August. Production, which came from the Aydelotte property, ran to 104 tons.

The Southern Mining and Manganese Company, headed by Herman Miller and B. W. Fitzgerald, who operate the Southern Hill property near Cushman, produced 35 tons of high grade ore during August.

Washing Plant Under Construction.

The Hendricks Mining and Milling Company, operating the Polk Southard property near Cushman, is installing a washing plant and pipe line. The pipe line will be three miles long, running from the bayou to the plant site. V. C. Johnson of Little Rock is associated with the company. He has been operating a power shovel on the property. Since he started the company has accumulated some 40,000 tons of mill dirt. A. C. Hendricks, formerly of Texas, heads the new company, which expects to have the plant in operation in about 60 days. E. C. Haase of Glenwood is assisting in the construction. As soon as he completes his work here he will go to Sevier county and start operations of the Bellah zinc mine, 13 miles north of DeQueen. This operation will be conducted by the Bellah Mining Company. J. W. Wright also is associated with the company.

Developments In Manganese Field Marked

Gazette 10-10-43

Special to the Gazette.

Cushman, Oct. 9.—Four new washing and concentrating plants are under construction in the Batesville-Cushman manganese field, and another will be started in a few days. Plans have been worked out to beneficiate low grade ore by operators here and a small pilot plant has worked out successfully.

Ore production for September ran approximately 800 tons, most of which was high grade. Most of the ore being produced in the field is being bought by the Metals Reserve Depot at Batesville, Major Ruggles in charge.

Among others who visited the field during the last few weeks was Arthur J. Blair, geologist from the Tennessee Coal, Iron and Railroad Company of Birmingham, Tenn.

Par-Mar Installs New Pilot Plant.

Par-Mar Engineering Company ran 100 tons in September. They installed a small pilot plant on the bayou at Batesville, to beneficiate low grade with satisfactory results. Operators expect to build a much larger plant for the same purpose. They operate the Kelley, a tract on Lafferty creek, where they are conducting hydraulic operations, and the Bone Cave Hollow property. James Woods is operating engineer and Max Cohen, work manager.

The Walter H. Denison Manganese Company, Reed Denison of Cushman, directing operations, made large production in September, producing approximately 250 tons of high grade ore.

The Arkansas Manganese Company, headed by Jack Gibbons of Cushman, produced 100 tons of high grade in September. Lack of water cut production.

Washing Plant To Be Completed.

The E. and A. Mining Company operations directed by James Wood, operating on a tract on the bayou, about five miles northeast of Batesville, will have a large washing and concentrating plant completed within the next 30 days. Operators are conducting hydraulic operations.

Charley Sims of Cushman, operating on the Turner and Waters properties, produced 50 tons of high grade in September.

Grace and McGee, operating the Chin property on Cave creek, produced approximately 80 tons medium grade in September. Their long 300-foot tunnel is in steady production.

Gray Hill Production Good.

C. S. Little, operating the Gray Hill property in the north part of the field, made a good production in September. He produced 25 tons of high grade and 140 tons of low grade.

The Southern Hill Mining and Manganese Company, operating the Southern Hill property near Cushman, produced 30 tons of high grade in September. Operations are in charge of Miller and Fitzgerald of Batesville, who are operating four producing shafts.

Lou Peterson, long time manganese mine operator, is constructing a washing and concentrating plant on the Turner property. It will consist of a big log washer and four jig cells.

Pyrolusite On Austin Property.

Stanley Bourne, and Ernest Stroud of Batesville, operating the Austin property near Mount Pleasant, have their first shaft down 83 feet and are still in pyrolusite, a manganese ore used for chemical purposes. Operators also have struck ore in two other shafts. They expect to start construction of a washing and concentrating plant in the near future. Assays on the ore made by chemical plants revealed that it is usable for chemical purposes.

The Hendricks Mining and Milling Company, operating the Polk Standard near Cushman has a new washing and concentrating plant under construction. A three-mile seven-inch pipe line running from the bayou to supply the mill with water is complete. A big oil engine will do the pumping at a rate of 500 gallons a minute. Plant equipment will be a large 30-foot double log washer, three batteries of jigs containing 13 cells, and three concentrating tables to handle the fine ore. George Weigart has been employed as consulting engineer.

MAGNESIUM INDUSTRY READY FOR EXPANSION IN POSTWAR PERIOD

Gazette 10-8-44

New York, Oct. 7 (AP).—Waiters at the swank Waldorf-Astoria hotel prepared to serve another routine trade association luncheon one day last week. One of them spied a wheelbarrow. It had been placed on display in the luncheon room by the officials as part of an exhibition of products.

To the waiter the wheelbarrow appeared to be made of steel. Guests still were to arrive, so out of idle curiosity he braced himself to lift it and roll it a couple of feet, "just for fun." But bracing was unnecessary. The wheelbarrow was so

light the waiter fairly jerked it off the floor. It weighed only 30 pounds, against the usual 80-odd. It was made of magnesium.

The occasion was the first annual meeting of the Magnesium Association. The wheelbarrow was only one of many products on display to show what the light metal can do for peace as well as for war.

Millions of other Americans will have reactions similar to the waiter's, the magnesium industry believes. Upon this premise it foresees a tremendously bright future. By mid-week the War Production

Board had announced an expected end to all government controls on the use of magnesium. The industry is faced with finding markets to absorb a vast war-expanded production capacity for 600,000,000 pounds yearly, compared with a mere 6,000,000 in 1941. But manufacturers and fabricators alike welcome the challenge. With government controls gone, they can make anything they want—so long as manpower is available.

The Dow Chemical Company, producer of about half the wartime output and a pioneer in the development of magnesium in America, is one of 40 manufacturing and fabricating companies in the association. Dow officials give this preview of what they think Americans soon can expect from magnesium, which is only one-quarter the weight of steel and about one-third lighter than aluminum:

For consumers like the American housewife, the emphasis will be on making tasks easier by manufacturing lighter products, especially those that move. A vacuum cleaner made of magnesium will be easier to push. Other applications will appear in washing machines, cooking utensils, household appliances, garbage pails, straight-backed chairs, cocktail trays, radios and cameras.

Good results have been obtained in the cooking utensil field. Magnesium alloy frying pans and griddles are said to be excellent heat conductors—insuring an even cooking surface rather than one not in the middle, less hot at the edges.

Montgomery Ward and Sears and Roebuck are interested in magnesium cooking utensils as a peacetime line, say Dow executives. They add that now is the time for industry to consider using machines and equipment made from magnesium—where adaptable. This is because much machinery is ready for replacement after extra-heavy wartime strains.

Magnesium alloy textile equipment is mentioned as a typical application. Already used for this purpose, Dow men say it has been highly successful.

It is explained that in machinery the lighter the moving parts, the less power it takes, thus reducing operating costs.

If the automobile industry goes in for lightweight cars as indicated by Henry Ford, Henry J. Kaiser and others, magnesium is expected to be an essential ingredient.

After products get to the mass production stage, prices are expected to be slightly higher than aluminum—perhaps about 10 per cent on the average, say Dow officials. Aluminum will be the biggest competitor.

New methods learned by fabricators as they go along are expected to reduce prices even more. The price per pound compares favorably with aluminum now but fabrication costs are higher. On the other hand, Dow men say magnesium is easier to machine.

The Magnesium Association found in a poll of fabricators that almost 100—virtually all who were queried—wanted to stay in the magnesium business after the war and were anxious to develop civilian markets.

Supplies to make magnesium are limitless. A cubic mile of sea water contains 9,000,000,000 pounds of raw magnesium.

Magnesium Supply Above War Needs

Democrat 3-13-44

Washington (AP).—The Senate's Truman Committee today released a report charging "extravagance and inefficiencies" in a giant \$133,000,000 government-financed magnesium project at Las Vegas, Nev., but reported production of that metal has reached a point where its use for civilian goods manufacture should now be permitted.

The report urged the War Production Board to cancel its order limiting the use of magnesium to war and essential civilian items. Such a step, the committee said, would lay the foundation for a new postwar industry through development of new uses for the metal and protect the government's \$500,000,000 wartime investment in the magnesium plants.

Research Recommended.

Further research should be undertaken at once, the committee said, to develop magnesium for such uses as the making of photo-engraving plates, automotive parts, portable tools, conveyors, vacuum cleaners, typewriters and business machines. Magnesium is a metal one-third lighter than aluminum.

In charging waste and inefficiencies in the construction and early operation of the Nevada development, described as the world's largest, the committee said its actual cost as of last November 30 was in excess of \$129,000,000, and that its final estimated cost of \$133,000,000 was almost double original estimates.

The project was authorized by the Defense Plant Corporation in 1941 under contract to the Basic Magnesium Corporation, of Cleveland, O., but since October of 1942 has been managed by the Anaconda Copper Mining Company.

Manganese Production

On Increase

Democrat 3-12-44

Cushman, March 11.—Production of manganese ore in the Batesville-Cushman manganese field continues to rise month by month, notwithstanding labor shortage and weather conditions not suitable for mining. February production ran approximately 1,410 tons, about half of which was low grade and half high grade. The demand for low grade from Alabama pig iron furnaces still is heavy. March will show an increase in the shipments of this grade ore.

The Walter H. Denison Manganese Company, of which Reed Denison of Cushman is in charge of operations, was the largest producer in February. Its total ran approximately 400 tons, of which 320 tons was low grade and 80 tons high grade. The low grade went to pig iron furnaces. Most of the ore was mined on the Bill Jim, Wild Cat and Ozark properties. The pig iron furnaces are using low grade that runs from 25 per cent up.

A component part of this ore is used for munitions and equipment for the armed forces.

Big Plant In Operation.

The Hendricks Mining and Milling Company has its big plant near Cushman in operation. Alvin Hendricks is general manager, George Weigart, operating engineer; Joe Jeffcoat, superintendent, and W. B. Herrell, sales manager. The main office is located at Batesville. It was the second largest producer in the field in January, its tonnage running approximately 305 tons. One hundred, fifty-five tons were high grade, and 150 tons, second grade and wad. The production of high grade came off the plant, and averaged 48 per cent metallic. The plant is one of the largest and most modern washing and concentrating plants ever built in north Arkansas, and in a few weeks probably will be producing 400 tons a month.

The company conducts mining operations on the South Hill, Polk Southard and Turner properties near Cushman. The flow sheet of

the big plant starts with a puddling vat. From this vat the crude goes through two sets of log washers, then into a scalping screen, which separates the lump ore from the fines, then into a sizing screen which sizes the fines into sizes from 1-16 to 1-4 of an inch. From the sizing screen the ore goes into jig cells, which take out all the foreign matter. There are three jig cell batteries, two of which carry four cells each, and another which carries five cells. The extreme fine ore is concentrated on three concentrating tables. The plant is electric powered. Two generators are driven by one 100-horsepower Diesel and the other by a 120-horsepower Diesel. The plant has a capacity of handling 100 tons of crude an hour. Water is furnished the plant by a pipe line 15,500 feet long, running from the bayou. Strip pit mining operations are carried on with a

two-yard power shovel and bulldozer. Thirteen trucks handle the crude and the processed ore.

Preston Grace and Marshall McGee, operating the Chin mine in the Cave Creek area, made a production of approximately 100 tons of second grade and wad ore during February. The production was cut some because of bad weather conditions. It has two new shafts in operation and is sinking a third.

To Install Scales.

Major Ruggles, in charge of the buying depot of Metals Reserve, Batesville, has received authority from Washington to install a set of scales at the ore yard, two and a half miles northeast of Batesville. This will save 10 miles of hauling for each truckload of ore sold to Metals Reserve.

The Arkansas Manganese Company, headed by Jack Gibbons of Cushman, produced 280 tons of ore during February. One hundred, thirty tons were high grade and 150 tons low grade. Operations were retarded some during February and early March by heavy rains. The Arkansas Manganese Company operates the Aydelotte property near Cushman, which has been producing for many years. It is sinking seven new shafts on the property and its March production probably will exceed that of February.

Charles Sims, operating the Einstein and Waters properties near Cushman, produced 75 tons in February. Twenty-five tons were high grade and 50 tons low grade. He recently has taken over the Tate

property on which he has sunk two shafts, both of which are now in ore.

Two Shafts Lost.

C. S. Little of Batesville, operating the Grey Hill property, lost two shafts in February because of heavy rains which caused them to cave in. He will start drilling operations soon to prove up a run of ore that lies from 18 to 22 feet deep. If it proves satisfactory he will start strip mining operations on the property.

The Par Mar Engineering Company and E. and A. Mining Company have consolidated. They produced about 200 tons of high grade ore on their beneficiating plant at Batesville in February. They will add filters, 12 concentrating tables and a rotary sintering kiln to the plant, and will start operations on the Lafferty Creek property in a few days.

Arkansas Dem. 2-18-

4,000 Tons Manganese Leaving Batesville.

Mountain Home, Feb. 17 (Spl).—

Four thousand tons of low grade wad manganese ore are being shipped from Metals Reserve stock piles in the Batesville - Cushman manganese field, to the Woodward Iron Company of Woodward, Ala. Production in January and early February ran to 717 tons. Production was reduced by the phosphorus penalty applied by Metals Reserve and bad weather. The Walter H. Denison Manganese Company produced 225 tons; Davis Mining Enterprises, 197 tons; Charles Sims, 100 tons; Arkansas Manganese Company, 130 tons; Grace and McGee, 50 tons; M. N. Glumicich, 10 tons.

The Davis Mining Enterprises now have in operation a large washing and concentrating plant, the largest ever built in North Arkansas.

Operations and production in the North Arkansas Zinc and Lead Field are increasing. The Arkansas Mining and Refining Trust Company, which has taken over the old Advance property on Crooked creek near Harrison, is shipping mine run zinc sulphide to Eagle-Picher in the Tri-State field. They had shipped five cars up to February 15.

Lewis Flader and Associates, operating Mine 16 in Marion county, have one tunnel back to 630 feet and another to 230 feet both in good ore. They will start installation of a crushing and concentrating plant in the near future which will also include a selective flotation unit to separate all other minerals in the ore from zinc. C. R. Prunty of Little Rock and associates are driving two tunnels in good ore on the Dolly Agness and Gladys Marie in Section 16, Marion county. Hedges and Huer have taken over the Brewer Mine near Ponca, in Newton county. They shipped their first car of high grade pine leaf carbonate last week. They have also located a large deposit of kaolinite on another property which is expected to be in operation soon. James Rogers, operating Coon Hollow near Zinc, will start construction of a mill in the near future.