

OUTPUT OF LEAD AND ZINC GROWS

After Years of Effort the
Miners of Arkansas Have
at Last Built Up
an Industry.

PIONEERS NEVER LOST
THEIR FAITH IN FIELD.

Hampered at First by Bad
Wagon Roads and Lack of
Railroad Facilities.

(Special to The World.)

YELLVILLE, Ark., March 23.—After twenty years of persistent effort and hard work the miners in the lead and zinc field of Northwestern Arkansas have built up an industry that gives promise of wealth and additional prestige to that part of the State. Lack of capital and railroad transportation, wagon roads that were almost primitive and the ridicule of other States had held back development, but the pioneers never lost faith in their belief that the Ozarks region is rich in mineral resources. With new railroads, automobiles and better roads, outside capital is gradually being attracted and much of the old prejudice against the State is passing away.

According to J. H. Hand, Special Agent of the Arkansas Bureau of Mines, the production of ore during 1917 was greater than that of any other year. In his report the shipments and production are summarized as follows:

	Pounds.
Zinc shipments—	
Marion County	18,175,000
Sevier County	12,434,000
Boone County	7,917,000
Newton County	6,377,000
Lead shipments	1,164,000
Total shipments	45,967,000
Ore in bins and on docks at close of year	3,900,000
Total production, 1917	48,867,000

Mining Methods Different.

Mining methods in Arkansas are different than those followed in other zinc and lead districts. Most of the mines are simply tunnels driven into the hillsides, instead of the usual shafts running down into the depths. Many small mines, run by two or three men who own the land, have given out enough ore to the workers to provide them a livelihood. Mr. Hand gives these facts:

"Ore production on what might be termed a commercial basis in this field began during the year 1914, accurate figures on which are not at hand, but estimated at approximately 7,000,000 pounds. With activities started in 1914, attention of the United States Geological Survey and the State Bureau of Mines was brought to the field early in 1915, and close tab was kept on the production of ore during that year, which showed a total of 15,400,000 pounds sold. The United States Geological Survey, in conjunction with the State Bureau of Mines, compiled a detailed report of ore sales during the year 1916, which showed an increase of 140 per cent. over the preceding year, or a total aggregate of sales amounting to 36,600,000 pounds for that year.

"Figures compiled under the authority of the State Bureau of Mines on ore production and sales during 1917 show that this district produced 48,867,000 pounds in 1917. This is a substantial increase over all former records, though scarcity of cars for ore shipping handicapped production seriously during the later half of the year.

"The steady increased production as shown above is due to the opening of new mines and improved or enlarged facilities for operations at older mines. Practically every mine under operation has mainly financed its development and equipment on returns from its own production, which necessarily started in a modest way through lack of initial capital which is indispensable in other mining fields and would serve a useful end in hastening returns here.

"Operations of mining," he declares, "are by driving drifts or tunnels into the mountains. The ore

stratas are found exposed at the surface on the mountain sides, where, by erosion nature has done the prospect work which costs thousands of dollars in other fields—that of exposing the ore bodies. In many instances 'pay dirt' and sometimes rich beds of free ore, ready for market in the form it is taken from the ground, are found beginning at or very near the surface. Tunnels are driven in, following the levels of the stratas thus exposed on the hillsides, and all ore and waste are removed from the mines on tram cars, requiring but little power, while expenses for pumping and hoisting are unnecessary. In some instances the hills have been penetrated to an extent of 500 to 1,000 feet.

"Were it not for the material advantages afforded in favor of low cost of production, the Arkansas mining industry could not have advanced as it has. Obstacles which have been encountered here could not have been met without sure loss in any other mining field. However, as the mining industry grows, obstacles which the pioneers have had to contend with are being overcome. All mining ventures here have not been successes. In some cases failure was due to the quality of the ground. But in the majority of failures incompetent management or stock jobbing designs may be easily identified as the cause. Operators who have contributed the bulk of tonnage have realized liberal profits even under lowering ore prices which forced many mines to suspend in the Joplin district during the past year.

Average Cost of Production.

"Average cost of production of milled zinc carbonate ore," he asserts, "is given at \$22 to \$24 f. o. b. according to distance of wagon haul to railroad. Blende production is around \$30 to \$35 per ton, milled concentrates. Free or lump ore, ready for shipment in the form that it was mined, without milling, has been delivered over twelve-mile wagon haul as low as \$7.50 per ton f. o. b. in car lots. Average volume of recovery of marketable ore from the mine run dirt and its grade or quality form the true test of merit as the basis of revenue realized from mining. A bulletin issued July 1, 1917, by the United States Geological Survey, giving statistics on the zinc mining industry in each of the zinc mining fields throughout the country, discloses vital facts on these points. In comparing those figures as they refer to the Joplin, Oklahoma, and Arkansas fields, based on averages for the year 1915 and 1916 on percentage of ore recovery from crude or mine run ore that was milled, it is found that the Arkansas zinc mines yield an average mill recovery of practically double that of mines named of the other districts named, as shown by the following figures. Average per cent. of concentrates recovered from crude or mine run ores milled:

Arkansas	7.35
Missouri (soft ground)	3.19
Missouri (shelving ground)	1.96
Oklahoma (Miami)	4.30
Oklahoma (Quapaw)	2.42

"The above table does not take into account," he says, "the large volume of free ore shipped from the Arkansas field without milling."

JOPLIN ENGINEER BELIEVES IN ARKANSAS ZINC FIELD

Mountain Echo
Yellville - 12-2-26

G. W. Christner of Ft. Scott, Kan., and Glenn J. Christner, of Joplin, Mo., a mining engineer who is in the service of one of the large interests of the Joplin district, visited the Rush and Boat Creek districts, in company with J. H. Hand, this week. This was the second visit of the latter named gentleman to this district during the present year. He says that the fact that the Arkansas field has vast undeveloped zinc deposits is becoming more recognized in the mining world, especially since the consumption of zinc is greatly increasing, while the older districts are running low in ore reserves. He expressed the belief that this district will soon be attracting large development concerns, such as first led the way to exploring the Joplin field on a large scale. That such enterprises who come into this field now, acquire leases and pursue a judicious development campaign, will realize great fortunes, he is quite sure, since prospecting here is not so expensive and uncertain as elsewhere, while the ore deposits already proven are unsurpassed in any other field.

1927

Work of surveying 10 counties in North Arkansas in the lead and zinc belts of the states under the joint supervision of the state geological department and the United States geological survey, will be begun by September 1, according to announcement made by George C. Banner, state geologist, who stated that results of the survey would be compiled and published by the state geological survey, which will indicate a detail map of the region and a review of mining activities in Boone, Newton, Marion, Searcy, Baxter, Izard, Stone, Fulton, Independence, Sharp, Randolph, and Lawrence counties during the past 40 years.

Ernest F. Burchard and Hugh D. Miser, senior geologists of the United States geological survey, will supervise the work, with the field work in charge of E. T. McKnight, junior geologist, and an assistant from the state department.

This is the first survey of importance of the mineral resources of this section since John C. Branner made the first one nearly 40 years ago. This survey should be much more valuable than the first one, for the reason that much more mining work has been done, and many more mines have been opened. North Arkansas is rich in mineral, and it is such surveys as these and the valuable information that they gain from them, that leads to quick development.

—Baxter Bulletin.

MINING EXPERTS APPROVE THE ARKANSAS MINING FIELD

Mountain Echo
Yellville.
(By J. H. Hand, Special Agent, Arkansas Bureau of Mines.)
12-2-27.

During recent months the zinc and lead resources of the Arkansas field have come under favorable notice of a number of mining engineers and geologists from other states who have made quite extensive investigations here on behalf of large outside interests, connected with the zinc mining industry, as well as for independent enterprises that are becoming attracted toward the mining business. It is the consensus of opinion as expressed by these experts, after having carefully gone into the local situation, that the Arkansas district is destined to become the leading center of zinc production in the southwest within the next few years. Outstanding developments, affecting the zinc industry that have taken place within the past two years, lend support to that conclusion.

Recovering from the slump after the war which put all mines out of business, the commercial consumption of zinc products mounted to the highest point in the history of the zinc industry in the year 1925 when the average monthly consumption of slab zinc, otherwise known as spelter, reached 99,300 tons, or 1,191,600 tons for that year. Those figures are exceeded for the year 1926, the first half of which shows a monthly average consumption of 104,000 tons or a basis of 1,248,000 tons for this year, while it is expected that the last half of the year will show a gain in consumption over the first half, as was the case in 1925. During the year 1925, the price of zinc ore advanced \$10 a ton but there has been no material change in ore prices so far this year. The ore for this great volume of metal consumed, is supplied from the Joplin field and other established centers that have equipment and other facilities for mass production.

It is an undisputed fact, frankly admitted by some of the best authorities on those older fields, that their ore deposits are nearing the point of exhaustion and cannot hold the present rate of production much longer, although they may be expected to continue at a reduced scale for some time.

The steady growth in consumption of zinc which is finding its way into the building trades and manufacture of chemicals, together with the depletion of ore supply in the older centers of production, are compelling factors that may be taken to account for this new awakening on the part of large mining interests and the activities of their representatives in exploring new possible sources of ore supply which must soon be utilized; but those interests are hardly to be expected to admit this at the present. For them to do so, would inspire new hope and courage among property owners in idle and undeveloped territory, as well as encourage independent enterprises to enter such fields before the big interests are ready to do so. The longer undeveloped regions can be kept idle and languishing, the easier it will be for mining monopolies to absorb the best of them on their own terms when they are ready to move in. The status of the zinc situation as above set forth, will naturally have a favorable bearing upon the destiny of the new fields in the near future, while as demand grows, together with the depletion of visible ore supply, the price of zinc ore may reasonably be expected to advance, thus making the development and operation of zinc mines more attractive to enterprises, not hereto-

fore engaged in that business.

While, from a discovery standpoint, the Arkansas field may be classed as an old one, yet, from another viewpoint, it is a new and undeveloped mining area, in the sense of commercial mining industry. The more than five million dollars worth of high ore that has been sold from mines and prospects, is but an incident in connection with explorations that have proven the continuity of these rich ore beds for hundreds, and even thousands of feet into the mountains and underlying the valleys as well. Here may be claimed for the Arkansas field what cannot be truly said for any other; that is, practically every operation from which ore has been sold, returned enough in values from beginning of development to finance operating expenses, also for equipment, wherever equipment was installed at such workings. No large financial backing has attended judicious mining operations here, but as a rule, the more successful demonstrations have been made on short term leases by experienced miners who had confidence and courage to dig in, and were forced to give up and abandon their leases when the after-war panic hit the mining industry.

Perhaps the reason why Arkansas has not officially followed the example of other states in bringing her zinc resources to the favorable knowledge of outside mining enterprise and development capital, may be because this state contains such a vast variety and volume of other mineral wealth which is also undeveloped, as well as neglected by the state which now receives over two million dollars in revenue annually from production of mineral wealth. Dr. Geo. C. Branner, state geologist, and W. N. Wilkes, commissioner of mines, deserve high credit for the tireless efforts which they are jointly putting forth, under financial difficulties, to bring out reports on the zinc and other mineral resources of the state that will supply correct information on the same which is now being sought by people in many states.

In the mean time, those who own mining property in the Arkansas field are warned against the fly-by-night option seeker, ready to take advantage of the first signs of returning life to the district, by tying up property so as to go out and fish for a buyer, without regard to its improvement and thereby possibly deprive the owner of a chance to dispose of his land to advantage under a lease to people who would try to develop its value.

It is not probable that there will be much buying of mining property here until after mining activity shall have been established. History of progress in other fields, notably around Joplin and in Oklahoma, shows that the industry was developed primarily under the lease system which seems to be preferable to most mine operators. It is therefore believed by many who have studied the local situation, that owners of mining property having merit, can offer no stronger encouragement to development of this district upon a commercial mining basis, as well as the advancement of their own interests than to grant liberal leases on their ground to those who are able and disposed to work it. The sooner all realize that mine investors are going to insist upon a chance to see and prove what they are buying, before paying out money on purchase, the better it will be for this district and all concerned in its advancement.

Rich Lead and Silver Vein Is Reported, Recalling Old Negro and His Secret Mine

Clarksville, March 31.—(Special.)—M. Caudle of Ozone a few days ago found a vein of ore near Ozone, and he took a sample of the ore to Little Rock, where it was assayed. Mr. Caudle came through here on his return to Ozone and he reported that the ore contains 5 per cent pure lead and 15 per cent silver. While here Mr. Caudle gave a small lump of the ore to C. Y. Jones. Mr. Jones has had it mounted by J. L. King into a stick pin. Mr. Caudle will not tell the location of the vein of ore, but he says it is 21 inches thick. Several persons around Ozone have filed mineral claims with the government on account of the find. (117-2329)

The find of ore, says E. T. McConnell of this city, brings to his mind a vein of lead that was known near here many years ago. Back in the "forties" there was an old negro slave north of Clarksville, who had lived there since before the Indians were removed from this section of the country. It was thought that the Indians knew of the lead and had told this old negro slave, but the slave would not tell where it was located, but when any of the neighbors would go to him and tell him they wanted some lead he would go and get it, provided they would hoe or plow in his place while he went for the lead.

One time two of them went to get the negro to go and get lead, and after he left one of them thought he would follow and watch the negro and find out where the lead was located, but the negro discovered that he was being followed and came back, and after that he would tell them when they came for lead that if they watched him he would not go to the place where the lead was.

In 1849 the old slave was given his freedom by his master, Asa Gailbraith, and went to California in the gold rush.

Shaft Is Found.

Several years after the old negro left here, some young men were out hunting and found a small well or shaft in the ground, and there was a ladder standing in the opening. The ladder had been there so long that it was rotten and they could not use it to descend into the shaft or opening for an investigation.

Later they procured a stout ladder and tried to find the shaft again, as they aimed to explore and see whether the vein of ore was in this shaft, but although they searched for some time they were unable to locate the shaft.

Several years after this, someone wrote to the old negro in California, asking him to write of the location. The old negro could not read or write, but he had a letter written telling them as near as he could the location of the lead, but no one was ever able to find it from the letter. Another letter was written the negro telling him of the failure to find the lead. He then wrote back that if they would send him sufficient money to pay his transportation, he would come and show them.

Mr. McConnell says that they made up sufficient money to bring the negro back, Mr. McConnell contributing some of the money, but they received another letter from the person who had written the former letters, saying that the negro had died. Since then many people have searched for the old shaft, but no one has found it.

Used Lead for Bullets.

Mr. McConnell says that it is no myth about the lead being in the vicinity of where Asa Gailbraith lived, as the negro would be gone a short time and return with the lead. The old negro was a blacksmith, and when

he returned, the parties who had sent him for the lead would go to his forge, get a ladle and melt the lead and mould their bullets, as they always carried their moulds with them and it was more convenient for them to melt them and mould them into bullets at the forge.

Many of the facts were related to Mr. McConnell by a very old man by the name of Jake Robinson, who lived a neighbor to Asa Gailbraith, and he had often gone to the old negro for lead.

The old farm is now owned by Borland Feltner, who has heard his father tell about the lead ore, as his father owned the farm after Mr. Gailbraith disposed of it.

The vein discovered by Mr. Caudle, however, is a few miles north of the Gailbraith or Feltner farm, farther up in the mountains. Since this discovery of lead and silver, the country will be searched in that neighborhood to find the lost shaft.

Zinc Mining Declines After Temporary Boom

St. Joe, April 3.—(Special.)—Activity in the zinc mining industry over this section, which was marked by a considerable revival 18 months ago, after a season of inactivity since the World war, is again declining. The Morning Star mine at Rush, which was one of the largest and first to resume and which has been in operation for the past year, closed down this week. No announcement was made as to how long the shutdown will continue. The accumulation of ore at the Morning Star is being hauled to Yellville for shipment.

Few large mines are now being operated in this section, the Cave Creek down some time ago. No ore is now being hauled to St. Joe for shipment, mines in Newton county having closed.

ARKANSAS ZINC ORE OF HIGH QUALITY

Affords Higher Percentage of Recovery Than That of Other States.

Zinc ores from the Ozark district of Arkansas afford a higher percentage of recovery of zinc concentrates than do the ores in Missouri, Kansas, Oklahoma and Illinois fields, it is said by J. H. Hand of Yellville, a member of the board of the Southern division of the American Mining Congress.

Mr. Hand based his statement on a study of the report of the United States Bureau of Mines on the zinc industry in the central states for 1927. Wisconsin ores produced a higher percentage of concentrates than Arkansas ores.

Comparison of the quality of the ores was based on the percentage of marketable mineral that is recovered in the form of concentrates from milling crude ore and on the percentage of metallic mineral content that these concentrates contain. The market value of the ore is based on the metallic content.

Statistics from the Bureau of Mines show that recovery of zinc concentrates from ores milled in the Arkansas Ozark district averages 7.35 per cent. Mr. Hand said. The metallic zinc content of concentrates averages 6 per cent of sulphides and 42 per cent of carbonate and silicate.

In the tri-state district of Missouri, Kansas and Oklahoma, the average recovery on 15,000,000 tons of crude ore handled last year was about 4.5 per cent zinc concentrates, which carries a shade over 58 per cent metallic content on sulphide and 38 per cent of carbonate.

The unit basis upon which the price of zinc concentrates is computed is 60 per cent metallic content for sulphide and 40 per cent for carbonate and silicate. For each unit upward a premium is added and for each unit downward a penalty is imposed, usually about \$1 per unit. On this basis Arkansas zinc concentrates would command a higher price than the tri-state district ores or Illinois and Wisconsin ores, Mr. Hand said.

He said the Ozark district in Arkansas languishes primarily because the mine owners are scattered throughout many states and cannot be brought together for organization necessary to put mining enterprise in motion.

Some of the great centers of zinc production are nearing depletion and the next few years are expected to see marked development in Arkansas, Canada and other new fields, Mr. Hand said.

9-5-28 Lead Ore Shipped
Yellville, Sept. 4.—A. J. Wassel of Summit is sending out a shipment of lead ore this week from the Lead Drift mine on George's creek, where he and Gus Butler have a lease. Consisting of several tons of high grade galena, Mr. Wassel has mined this at odd times during the summer. On that property and the Shawnee mines, joining it, he has mined and sold more than 100 tons of free zinc and lead ore. Several shipments have been made by J. M. Hampton under a former lease on the Lead Drift.

CITIZENS OFFER TO AID ZINC COMPANY

Last Obstacle Removed to Reopening of Smelter Near Van Buren.

Special to the Gazette. 3/10/29

Van Buren, March 9.—With the assurance of co-operation from a large group of business and professional men of Van Buren if the company is sued by landowners within a close proximity of the plant, there now remains no obstacle in the way of reopening the smelter of the Falcon Zinc Company, two miles east of here, which has been taken over by a large Eastern concern. C. M. Wofford, local attorney and leader in the movement for local co-operation announced tonight.

Names of 71 men were obtained to contracts pledging support and financial assistance in the event of litigation, when the petitions were circulated this afternoon.

The new company guarantees to put up \$2,500 to carry on legal action in case of damage suits and local signers of the contracts agree to furnish funds in excess of \$2,500, if damages are obtained and court costs assessed.

The local plant has been closed approximately two years and several damage actions have been brought against the Falcon Zinc Company alleging damage to farm lands near the smelter. Two of these are pending, having been sent back for new hearings by the Supreme Court, after a jury in Circuit Court here had found for the defendant.

The factory is in bad condition and several weeks will be required to recondition the plant. The new owners guarantee operation within six months if contracts are signed up satisfactorily to the company. At full capacity the old plant operated four blocks or eight furnaces and employed approximately 250 men. The new owners plan to operate at full capacity, with possibility of enlarging the old plant.

Leases, paying owners of property at a rate of 50 cents per acre annually, have been obtained on more than 75 per cent of the 1,400 acres included in the area of possible damage from fumes, gases and residues from the smelter, and these owners agree not to sue the company during the lease period of 10 years. Leases were obtained by agents of the new company, the name of which has not been announced officially.

ZINC SMELTER NEAR BUREN SOLD

aid for Plant and to Be Spent for Improvements.

Special to the Gazette. 4/17/29
April 16.—Purchase of plant of the Falcon Zinc Company, two miles east of Van Buren, by the New Chicago Mining Company, today by E. H. Wolff, principal owners of go mines at Joplin, Mo., of the company are in the consideration, acc'ds filed in the office of the court here, was \$50,000. The consideration will handle approximately 250 tons of zinc concentrates a day, the present productive capacity of the New Chicago mines.

Improvements to cost about \$75,000, including a smelting plant, will be made immediately. It will be about 90 days before the plant is ready for operations, Mr. Wolff said.

The deed filed here was signed by William Lanyon, president of the Falcon Company, who has been here the last few days. The plant was closed by the Falcon Company nearly two years ago.

Henry A. Oesterle, who represented Wolff, has been here the last two weeks making surveys and lining up labor. The sale climaxes a proposition submitted to local business men a few weeks ago, in which 75 men signed a contract to co-operate with the new owners in regard to any damage suits which might be instituted by land owners. The purchasing company agrees to start work within six months.

Zinc Smelter Bought By New Chicago Co.

Van Buren, April 18.—(Special.)—A deed was filed here Tuesday recording the purchase, by the New Chicago Mining Company, of the smelter of the Falcon Zinc Company, two miles east of here. The consideration was \$50,000 and improvements, to cost about \$75,000, will be made, it is said.

E. H. Wolff and A. M. Gaines are the principal owners of the New Chicago Company mines at Joplin, Mo. The company has general offices at St. Louis. It is said the plant here will handle 700 tons of zinc concentrates a day. The Falcon company closed the plant about two years ago.

Lead to Be Mined in Vicinity of Eureka Springs.

Special to the Gazette. 8/25/29
Eureka Springs, Aug. 24.—G. W. Hurlburt and his partner are doing excavation work on Hurlburt's farm near here, and preparing to open a lead mine. Hurlburt came to Eureka Springs four months ago and purchased the farm for stock raising. He formerly was a prospector, and in walking over the farm found lead. At present he has 16 men and four teams building roads and opening the mine. He is leasing all land possible in the vicinity and plans increased activities soon.

Geologist Is Surveying Yellville Mineral Field.

Special to the Gazette. 9/3/29
Mountain Home, Sept. 2.—E. T. McKnight, geologist with the United States Geological Survey, will complete a survey of the Yellville quadrangle this month. He has been working on the survey two years. The report will be published in July of next year. His work deals with all formations found in the Yellville quadrangle, and the

zinc and lead ore bodies in the north Arkansas lead and zinc field.

Mr. McKnight spent part of last week investigating lead and zinc prospects in Baxter county. During the last two years he has visited every prospect and mine in the district.

Mining Interests Seek Holdings in North Arkansas.

Special to the Gazette. 10/1/29
Yellville, Sept. 30.—As a result of recent surveys of this zinc and lead district by scouts for companies in the Joplin field, a deal has just been closed on several hundred acres of mining leases near Yellville. A. C. Tutt, a mining engineer of the tri-state district, took over the leases for companies that he represents, and announced that an extensive drilling campaign will be started soon to explore the properties for the deep ore runs, which are found below the deposits of zinc and lead, in the mountains throughout the north Arkansas field.

Interests behind this movement are heavily interested in zinc and lead production in some of the older mining fields, which are about worked out, and plan to have their properties here prospected and developed for operation by the time their present mines are exhausted.

At present, the north Arkansas region is recognized by the mining fraternity as being the richest center of undeveloped zinc and lead resources in the United States. Recent completion of good highways through the district, together with prospects for water power development on the White and Buffalo rivers near these mines, are stimulating outside mining industry to get control of holdings here on a large scale.

Heretofore, zinc and lead mining has been confined chiefly to the upper ore runs, which crop out on the mountain sides. In that manner, around \$5,000,000 worth of ore has been mined and sold from this district. With exploration by drilling, and developing the rich bodies of ore that have been proven in many places to exist below the valley levels, mining authorities predict that the north Arkansas area will surpass all other fields in capacity for production of zinc and lead.

Geologists Visit Lawrence and Sharp Counties.

Special to the Gazette. 11/5/29
Hoxie, Nov. 4.—R. H. Willits, local geologist, has returned from a five-day trip through Sharp and Lawrence counties with Edwin E. McKnight of Washington, D. C. They visited the gas, oil and mining districts of the two counties, gathered information for the government concerning prospective developments.

Mr. McKnight has been working in Arkansas for the last two years, gathering information for publication. It will be several months before the final report is ready for publication. One hundred and forty lead and zinc mines and drill holes were inspected in the two counties.

Machinery for Point Cedar Mine Unloaded at Amity.

Special to the Gazette. 2-15-30
Amity, Feb. 14.—Machinery for the lead mine at Point Cedar is being unloaded here. One car load has arrived and another will arrive soon.

W. J. Hemphill, Roy Hemphill, R. V. Thompson and Elma Thompson, all of Wichita, Kan., are here superintending the moving and placing of the machinery. Work of removing the ore will begin at once. This mine is located 12 miles east of here near Point Cedar. It is said to be one of the richest mines in the state. Lead, silver, gold and copper have been taken from the mine.

PIONEERS KNEW OF MINERAL DEPOSITS

Lead and Zinc Ore Noted in Arkansas More Than Century Ago.

Special to the Gazette. 3/9/30

By EDWIN T. MCKNIGHT,
(Associate Geologist, United States Geological Survey.)

That zinc and lead occur in the limestone counties of northern Arkansas has been known for more than 100 years.

As early as 1818 Schoolcraft, an explorer and ethnologist, during an expedition from the lead mining region of southeastern Missouri to the headwaters of the White river, in Arkansas, and back by way of Batesville, recorded the occurrence of lead "at the Bull shoals and on Trimble's plantation on White river" (Marion county) and "on Strawberry river in Lawrence county."

This trip was made at a time when the White river basin was uninhabited by white people in its headwater regions above Taney county, Missouri, and only sparsely inhabited below that locality.

Because lead in the form of ammunition played so indispensable a part in the economy of pioneer life it naturally received attention much earlier than zinc. The usual mode of occurrence of the lead ore is in rather large but isolated pockets in certain beds of the limestone. Owing to the fact that this ore (lead sulphide, galena) is fairly resistant to solution, it is common preserved and concentrated in the residual clay, from which it may be washed during one of the freshets so common at certain seasons in the northern part of the state. In the bed of a branch that cuts across a lead-bearing formation it is common experience to find perhaps as much as a bucketful of lead sulphide nuggets after each period of heavy rains. As the mineral is one of striking metallic appearance, such occurrences did not long escape the eye of the early settler, who quickly took advantage of this local source of lead for rifle balls.

"Float" Lead Traced.
Years before the Civil war many of the occurrences of "float" lead had been traced to their sources in limestone at some places and in clay at others. At these places small-scale gouging operations were undertaken, producing a yield that was negligible in comparison to the production from other parts of the country and yet ample enough to satisfy the domestic need of the operators. During the Civil war some of the deposits were worked more systematically, as a source of lead for the Confederate forces. One of these was the old Confederate mine, on Cave creek, in Newton county.

Although zinc is much more abundant than lead in northern Arkansas, it was neglected until a somewhat later date. The earliest attempts to work zinc deposits were made at Calamine, in Sharp county, in 1857, and again in 1871. These operations were, however, short lived. Active zinc mining began in the counties farther west in 1899; and reached its peak in the early war years of the World war, from 1914 to 1917. In 1916 and again in 1917, northern Arkansas produced zinc ores that would have yielded almost 7,000 tons of metallic zinc had the ore been all reduced to the metallic state instead of being converted in a large part to other forms, such as the oxide. At this period northern Arkansas boomed as it had never boomed before. The hub of the activity was the little town of Rush, in Marion county. The narrow valley of Rush creek held far more people than could be comfortably accommodated. For a mile and a half above the Buffalo river houses and tents occupied every available nook and even overflowed to the top of the low

sandstone bluff that borders the south side of the creek over part of its course. At least 14 mines were in operation in the district, though perhaps not all at the same time. Today the town of Rush is practically abandoned, although the single remaining store still caters to a rather large rural population.

Besides legitimate operations there was, during the boom period, the inevitable amount of speculation in mining property all over northern Arkansas. Mines of little value were bought and sold on the records of other mines. Expensive mills were built on worthless property or on property where less pretentious mills would have been adequate, and in too many cases, though not invariably, the men who were responsible for building a mill with someone else's money were, or should have been, aware of the fact that the property did not merit the mill. Such practices have done much to make the investing public wary of the district.

Market Declined Steadily.
During 1917 the zinc market steadily declined, owing to overproduction induced by the earlier high prices. Since then zinc mining in northern Arkansas has been practically at a standstill.

The later history of lead mining in the state has been practically parallel to that of zinc. In many places both have been produced from the same mine, where, of course, market conditions for zinc would greatly affect the production of lead.

There have been two geologic surveys of the northern Arkansas zinc and lead field. The results of these surveys were published in the Branner report of the Arkansas Geological Survey, 1900, and in the Adams report of the United States Geological Survey, 1904. Both of these reports are out of date, because the extensive development of the late war period not only brought to light much additional information on mines and prospects that were already known but led to many new discoveries, some of which were developed into important mines. It was for the purpose of bringing the information on the geology and development of the deposits abreast of more recent developments that the Arkansas Geological Survey, in co-operation with the United States Geological Survey, began in the fall of 1927 a systematic survey of the lead and zinc field. The work was undertaken in response to numerous requests for information on the district. The field work has been done by Edwin T. McKnight, associate geologist of the United States Geological Survey, but he has been visited in the field by Hugh D. Miser, E. F. Burchard and E. O. Ulrich, all members of the federal survey, who have done previous work in this region and who have contributed materially to the report on the region now in the course of preparation.

Lead and zinc ores are found from Lawrence on the east to Benton and Washington counties on the west, but the most extensive deposits are in Marion, Boone, Newton, Searcy, Sharp and Lawrence counties. During the course of the survey all the deposits that amount to anything and many that do not were examined. In addition, the geology of the Yellville quadrangle, which contains more of the ore deposits, was mapped, and a very detailed topographic and geologic map of the Rush district was made. These geologic maps show the surface exposures of the different rock formations and also the features of geologic structure, such as faults, anticlines and synclines. Their preparation has been essential to a thorough study of the ore deposits, especially as it has been found that most of the valuable deposits are confined to one formation, the Everton limestone, and are related, at least in some degree, to faults.

Deposits Resemble Joplin's.
The Arkansas ore deposits are in many ways similar to those of the "Tri-State" (Joplin) district of Missouri, Kansas and Oklahoma, but they are not as extensive or persistent. The original mineralization was practically the same so far as mineralogy is concerned. In both places the chief ore minerals were originally the simple sulphides of lead

and zinc, with minor amounts of iron and copper sulphides nearly everywhere present but unimportant commercially, except that in places iron sulphide occurs in large enough amounts to be an objectionable constituent. The Arkansas deposits differ from those now worked in the Joplin district in that in many of them the zinc sulphide has been oxidized to the carbonate or silicate. In the Joplin district the deposits are worked below ground-water level by means of shafts sunk in a fairly level plain. In Arkansas most of the workings are open cuts or tunnels into hillsides, well above ground-water level, although there are numerous places, especially in Sharp and Lawrence counties, where deposits have been worked below ground-water level by means of shafts.

The rocks that contain the Arkansas ores are, with few exceptions, much older than those of the Joplin district, but somewhat younger than the lead-bearing rocks of southeastern Missouri. In Arkansas, with the exception of certain deposits in Newton, Washington and Benton counties, that are in beds of the same age as at Joplin, the ores are in beds of Ordovician age; at Joplin they are in rocks of Mississippian age; in southeastern Missouri they are in Cambrian rocks.

The mining industry in the lead and zinc fields of northern Arkansas is at present at a low ebb. Many of the mills, including the machinery, were torn down and removed when the slump came in 1918, but perhaps more were left standing. At first some attempt was made to keep the properties in good condition, in the hope that the shutdown would be only temporary, but as time wore on it became evident that the shutdown was to be of indefinite duration. Today, with the exception of the Morning Star mill at Rush,

the Excelsior mill at St. Joe, the Bald Hill mill on Cave creek, the Butler mill at Lynn and perhaps one or two others, all the mills are in varying degrees of dilapidation. Machinery that cost many hundreds of dollars is rapidly deteriorating to the point where it can never be salvaged. Many of the shafts and tunnels have caved so that they have been inaccessible to examination during the last two years.

During 1929 no zinc was produced in northern Arkansas. A little lead has been produced from three of the four operating mines. At Ponca, up to November 1, the North Arkansas mine had taken out 15 tons of galena, although none of it has been shipped, and the Brewer mine had produced 20 tons of

galena. The Kilgore mine, in the same district, was being reopened when visited around the first of November, but had produced only a few hundred pounds of lead. The old lead mine, on Georges creek, a few miles north of Yellville, produced several tons of galena in 1929, but at present no up-to-date statistics are available.

That northern Arkansas has lead and zinc ores that are of commercial grade under certain rather exceptional economic conditions was amply proved during the late war period. The inactivity at the present time can be ascribed to the low price of zinc, the high price of labor and supplies, and the difficulties of transportation in a mountainous country rather remote from shipping points. On the other hand, the roadbuilding program of the last two years and the possibilities offered by certain proposed hydroelectric developments are factors that will tend to favor the resumption of mining operations. Just where the balance between all these factors lies that will permit a reasonable profit on mining operations is a problem for the engineer to decide.

Lead Ore Specimens Found on Calico Rock Farm.

Special to the Gazette. 8-30-30
Calico Rock, Aug. 29.—T. D. Hallie of Calico Rock recently submitted samples of mineral found on his farm two miles southeast of here, to the Chemistry Department of the University of Arkansas, and received a report that the mineral is galena or lead sulfide which is 80 per cent lead.

In 1915 a shaft was put down on this place in an effort to determine the amount of lead deposits but the walls of the shaft caved in and the effort was abandoned.

Because of the splendid showing the assaying office reports, Mr. Hallie will make further investigation.

Small Lead Mines in Newton County Reopen

Special to the Gazette. 11-25-30
St. Joe, Nov. 25.—(Special.)—Small lead mines in the neighborhood of Ponca, Newton county, are in operation again. The ore mill at Ponca, operated by Ed Minicus, is handling 2,000 pounds of lead ore a day. The firm of Malone & Young of Joplin, Mo., has purchased an interest with the Estep brothers of Ponca in the old Brewer lead mine. They announce that they will install a small mill and will have it in operation by Christmas.

Dan Thurman, T. E. Swift and T. J. Miller, all of Miami, Okla., are leasing mineral land there for development. Others are working small projects in the Ponca field now, and declare that their operations are re-

turning a profit. The ore is being trucked to Harrison for shipment by railroad.

Lead Mines Active.

Special to the Gazette. 1-17-30
St. Joe, Jan. 17.—(Special.)—Further activity in the Ponca mining field in Newton county is shown by the following shipments in the last few days: The Ponca Mining and Milling Company shipped a car of lead ore to Joplin, Mo., as did also the Beachwood Mining Company. The Estep Bros. Co. shipped a small car of lead the week before. Other smaller operators are shipping out cars jointly. In addition to reducing the ore, the mills near Ponca are now being used for pulverizing limestone, as the farmers there are treating large tracts with lime, preparatory to sowing sweet clover and alfalfa.

Arkansas' War Minerals

Lead, Saltpeter, Manganese and Zinc Are a Few of the Minerals Mined and Utilized for Munition Purposes in Conflicts of the Past. New Ore Bodies Are Constantly Being Discovered.

By TOM SHIRAS

Gazette 3-20-32

North Arkansas minerals have played an important part as war minerals in every war since the Franco-Prussian war and will probably play a more important part in future wars because of new ore bodies found in later years of peace.

During the Civil war large quantities of lead and saltpeter were mined by the Confederates for munition purposes. Manganese from the Batesville-Cushman field was utilized for munition purposes in the Spanish-American and World wars. Zinc from the North Arkansas field, embracing Marion, Baxter, Boone, Searcy and Newton counties went into munitions during the World war, and Lawrence and Sharp counties furnished a large quantity of zinc for munition purposes in the Franco-Prussian war.

During the last 40 years the zinc mining industry has shifted in North Arkansas. Most of the earlier zinc mining in Arkansas was done in western Lawrence county and eastern Sharp county, the heaviest operations being conducted around Smithville, Black Rock and Calamine. With the construction of the White River division of the Missouri Pacific, and the discovery of rich ore bodies in the counties farther north and west in the state, the industry followed the new discoveries.

The ore deposits around Black Rock and Smithville are very interesting and some of the earliest mining history in the state was written around them. The district has about 30 mines from which ore has been shipped, most of which has been sulphide and carbonate of zinc. The carbonate of zinc ore from this field makes the purest slab zinc that can be smelted from virgin ore and when a war is in progress it is in strong demand for munition purposes, being utilized in the manufacture of shells for the big guns.

The deposits lie in the southern Ozark mountain region, though the country containing them is far from mountainous, being gently rolling and having hills not more than 150 feet high above the valleys. Black Rock and Imboden on the Frisco are the nearest shipping points. The early day miners in the field did not have rail-



Zinc Mine In Northwest Arkansas.

road shipping facilities, however, and the ore and slab zinc or spelter was hauled a distance of 20 miles or more to Black river, where it was shipped by boat.

The first zinc mining recorded in the region was around Calamine, in Sharp county. One class of carbonate of zinc ore is termed "calamine" and the town took its name from this ore.

A zinc smelter was erected at Calamine in 1857 by the Independence Mining Company. This concern also opened several mines and conducted a general mining and smelting business. It is said that this smelter was one of the first zinc smelters in the United States. The operations of the Independence Mining Company were not successful, and they were forced to abandon the project. The price of zinc at that time was very low, and they had too many obstacles to overcome in getting it to market.

In 1872 a second smelter was put into operation and a group of mines opened by the American Zinc Company. The ore they mined was hand-picked carbonate of zinc, which they reduced to metal in their smelting plant. The total output of metal is said by John Viehle, who had charge of the plant, to have been 126 tons. Besides this metal a large quantity of zinc carbonate was shipped.

No fuel for smelting purposes was available except wood, and consequently the ores were reduced with charcoal. Besides their mining operations they had to maintain charcoal pits, which added greatly to their overhead expenses.

The slab zinc and ore which was shipped in the rough was hauled by team and wagon to Rainey Ferry, on Black river, for shipment by boat many hundreds of miles to Memphis, the nearest railroad point at that time.

Some of the ore was shipped by boat to New Orleans, and on to Staten Island. The metal produced at Calamine by the Independence Mining Company was purchased by the Union Metallic Cartridge Company, who used it in making shells for the Franco-Prussian war.

While zinc was very low in price in those days, being in line with other commodities, it was also very scarce, and this concern was probably a war baby of the Franco-Prussian war.

Calamine today is a very quiet little inland village with one store. The older citizens of that vicinity, however, can tell stories of activities that vie with some of the old Western mining camps, and point to the old ruins of the smelters and the deserted mines as evidence.

As years have passed many stories of the richness of the mines have been told. In some tales the lead and zinc ores have been changed to silver and if one were a credulous person he could easily believe the old mines were as rich in silver as some of the famous silver mines of the West.

Old-timers in the Calamine section, who were associated with the operations in the early days will swear, too, that the hands at the mines and smelters were paid off in hot silver dollars. They say that they were made on the ground from the metal smelted in the smelter, but there is no evidence to bear out this statement.

In this locality much of the iron used by the pioneers of North Arkansas was also mined and smelted. The old iron furnace used to stand on the banks of Big creek, near the town of Jesup, in western Lawrence county, and the iron was mined from the adjacent hills.

Besides the iron mines and the furnace there was a small iron mill, in which the pig iron was reduced to marketable shapes and sizes.

A dam across Big creek furnished power for the big fans that supplied the immense bellows for re-heating and for the large power hammers and cutters, which were used in the operation. One of the abutments of this old dam is still standing.

Northern Syndicate Securing Mining Leases at Yellville.

Special to the Gazette. *3-30-32*
Yellville, March 29.—Mining leases are being taken on zinc and lead properties in this district by the Ozark Mine Owners League for a Northern syndicate on an exploration and development program which is to continue over a two-year period. J. H. Hand, secretary, who has local charge, said that leases have been secured on some of the best known mining properties in this field.

Romance of Lead

Hardy Adventurers in Early Days Gambled With
Came Out Second Best—Mushroom Towns Sprang
of the West, Only to Fade Into Insignificance

By TOM

There is romance in lead and zinc the same as gold, silver and diamonds. Pages of history, with attending hardships and vicissitudes, could be penned about the hardy adventurers, some broke, some with thousands in hand, who have gambled with Lady Luck during the last century in the north Arkansas zinc and lead field.

Each man who came here, from Henry Schoolcraft, an English geologist, who reported the first lead ore in the district in 1818, to the last man who straggled out broke after the price of ore smashed just before the World war ended, contributed to the historical lore of the field.

Henry Schoolcraft was the first man in the field, and his name is associated with other minerals in other sections of Arkansas. Owing to the demand of the pioneers for lead, and to the comparative ease with which it could be smelted, lead of the Ozark region was known long before the zinc deposits. The valuable lead mines of southeast Missouri induced the exploration for lead in the upper White region. In December, 1818, Schoolcraft made his historical trip across southeast Missouri to the headwaters of the White river, descended the White river to Batesville, and returned to Missouri across Lawrence county. He mentions finding lead at Bull Shoals on the Trimble plantation, in what is now Baxter county, and on Strawberry river in Lawrence county.

In 1851 a lead smelter was operated on West Sugar Loaf creek, in what is now Boone county. Two other smelters were installed in the same section before the Civil war, and one in 1873. The first was in charge of William Bennett, and the latter was operated by Colonel Childers. Lead Hill takes its name from these operations. Coffee Hill, a mountain between Dodd City and Lead Hill, takes its name from the fact that it was covered with float lead. When women in the neighborhood needed coffee they would send the children up the mountain to gather enough lead to buy coffee with at the smelter commissary. Early day lead smelters also were operated in Newton county.

Iron, too, had its day. Iron was mined and smelted in 1850 in Carroll county, and in 1857 in Lawrence county. Most of the settlers drew their supply of this metal from these two counties.

Zinc was smelted in the north Arkansas field at Calamine in Lawrence county in 1853, and again in 1871. These operations were of short duration.

Prospecting in Marion, Boone, Baxter, Searcy and Newton counties began in the 80's with the "catfish and venison" prospectors. Among these were Dr. McCabe and John Wolfer, and associates. They opened up the Morning Star mine on Rush creek in Marion county, and other prospects on Buffalo river. They had but little money and prospected Indian fashion, living on what the land afforded.

They thought they had a fortune in silver at the Morning Star. A chemist at Mineral Point, Wis., gave them an assay of eight per cent silver on their ore, and they built a smelter at Rush. Charging the smelter with charcoal and ore, they waited expectantly for the silver to run out at the bottom. But it didn't run. Instead, the atmosphere above the smelter became charged with all the colors of the rainbow, caused by escaping zinc fumes. They learned later that there was no precious metal in the ore. The smelter still stands as a monument to their faith. John Wolfer died in poverty in 1910, about seven miles from the Morning Star mine, which was then making a big production

of ore. Fate plays many tricks on miners.

Capt. George Chase of Fayetteville was another early miner who left his mark on the north Arkansas field. He and his associates acquired the Morning Star mine in the 90's and went on with the work the former owners had started. They opened up an immense body of ore. One chunk of 11 tons, said to be the largest piece of zinc ore ever taken from the ground, was mined there and taken to the world's fair at Chicago.

Captain Chase operated the mine spasmodically and shipped a big tonnage of ore. He leased it to other operators from time to time but never sold it. During the World war he operated the mine night and day for several years, shipping thousands of tons of ore. Captain Chase's dream came true. He developed a big mine from a prospect.

Buffalo City, at the mouth of Buffalo river, was the nearest boat landing on White river to the Rush creek and Buffalo river mining camps, and late in the 90's hundreds of prospectors drifted through this port. Captain Cook, Howard Gallup, Bill Tripp and Henry Buie held sway in the town. They developed the Bonanza mine, and other properties on Cow creek, the Lion Hill, and other mines on Warner's creek. Mr. Gallup opened a store at Buffalo and is the first man in the mercantile business in north Arkansas who ever sold 25-cent cigars and \$12 boots successfully. These four hardy adventurers

are dead but Mr. Gallup and Bill Tripp lived to see their dreams come true. They saw high-priced ore and a big production.

The Teagarten brothers of Yellville played their part in the game of zinc. They opened up the Silver Hollow mine on Buffalo river in the late 90's and shipped hundreds of tons of ore by boat down White river to Batesville, and thence by railroad to the smelters. Jim McCarthy of Yellville turned the Yellow Rose, a prospect at the mouth of Rush creek, into a big mine and for several years operated the property day and night.

Captain LeVasseur now of Yellville, aided by Martin Littleton, well-known New York lawyer, and associates, opened the Red Cloud mine on Buffalo river early in this century. The property was operated night and day. At night it was lighted with gasoline flares and the ore faces in and outside of the mine sparkled as if studded with diamonds. Captain LaVasseur later was associated with other mining ventures in the field. He did not leave when the smash in ore prices came. He remained in Yellville and has done much of the engineering work for the White River Power Company, which has several water power projects on the White, Northfork and Buffalo rivers.

W. H. Almy, Lon Brown and Judge Cave were early prospectors in the zinc camp in Boone county. Mr. Almy was a New England Yankee, but believed in the Arkansas Ozarks and took an 80-acre homestead on

Sugar Orchard creek in the early nineties. About the time he proved up on his homestead, prospectors began to find zinc ore in the neighborhood and he prospected his land and found it rich in zinc silicate.

Mr. Almy died at 74. He cleaned up a comfortable fortune and did most of the things he had wanted to do all his life.

Lon Brown had been a prospector and knew the ores of the zinc camp like a book. He has an uncanny knowledge of where to dig to strike pay dirt, and when the boom came in 1914, he bought most of

Every schoolboy now knows that the earth is only one of a large number of heavenly bodies which are moving around a central sun and form what we call the solar system. Nine of these bodies, including the earth, are called planets, because they wander about in the sky and do not always occupy a fixed position as the stars do. These nine worlds do not shine by their own light but borrow their light from the sun. Beginning with the one closest to the sun their names are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. There is a special reason for each of these names although this matter will not be discussed at this time.

ed several big producers. He would grubstake any prospector provided they would take a lease and dig where he told them to. Few ever lost money on his judgment. He made a good stake but it slipped through his fingers. He is farming now.

Probably the most spectacular figure in the field was J. C. Shepherd, son of former A. R. Shepherd, who was governor of the District of Columbia under President Grant. Shepherd was a trained mining engineer and geologist and had spent his life in the mining industry. He was mining silver in Old Mexico when Villa went on his rampage, and he and his wife threw what they could in a suitcase and left Mexico with hundreds of other mining men. They landed at Rush, in Marion county, in 1912. Zinc ore was low then, and Mr. Shepherd had no money to operate with, but he assembled several men on the creek together and they went to work. The ore in their bins was their capital stock. In 1914 zinc was \$135 a ton, and Mr. Shepherd had favorable smelter contracts. He ran his shoestrapping to approximately a half-million dollars in 1918. Then the slump came and he failed to reach his goal. He is prospecting now for gold in Old Mexico.

The largest camp in the field during the boom days was Rush, in Marion county. About 6,000 people lived there and nearby. They began to arrive early in 1914 and the last of them left in 1918, after the price of ore collapsed. It was once the largest incorporated town in the South, populated with hard rock men and their families. It resembled an early day Western mining camp and was wide open, but there never was a killing in the camp. The code of the camp was to settle all difficulties with bare fists.

INTEREST IN ZINC AND LEAD REVIVES

Higher Prices for Metals
Bring New Activity in
North Arkansas.

Special to the Gazette. Aug. 13, 1933
Yellville, Aug. 12. — Dr. George C. Branner, state geologist, has just concluded a tour through the Ozark zinc and lead mining region to check up on geological features in connection with the mineral resources of this district. Dr. Branner also took occasion to verify the conclusions of various mining engineers regarding the favorable possibilities of mining industry here on an extensive commercial scale.

It is considered significant that other geologists and mining engineers recently have been scouting this field and inquiring about properties for large production of ore. Among the visitors were representatives of a large zinc smelting concern, who took observations of the ore deposits at different mines. Their attention was attracted by the high grade of the zinc oxide which is plentiful in this district. They announced that their smelter will contract to buy 600 tons a month of these oxide ores, in addition to the higher grade sulphide ore.

Considered Good Omen.

Local leaders in the mining fraternity consider these movements as a good omen for early activity in this district, in view of the growing strength shown lately in the metal market, and with the price of zinc ore having advanced from \$17 to \$35 a ton. Anticipating the early return of mining interest, several leading zinc and lead mines and prospects in the Yellville area have been pooled under a plan adopted by a Mine Owners League. Several groups of these better developed properties are being considered by engineers for proposed exploration and development.

The Mine Owners League plans to establish a local market for buying free ore from prospectors who have started "gopher mining at several places. It is expected that such market facilities would stimulate operations on some 50 properties in the district. It would enable the small producer to realize on his output to provide expenses from week to week, whereas he could not carry on to get out a carload shipment. Free ore production is under way at the Pigeon Roost and the Big Buck lead properties, also at the Onwata and the Red Fox zinc mines, where shipments of ore are ready to be moved.

The best record of production made by the Arkansas field occurred during the latter years of the World war, when zinc and lead ores to the value of approximately \$5,000,000 were sold. Despite the healthy showing which this district made before the collapse of the zinc market, the mineral deposits here hardly have been scratched, in the opinion of leading geologists and mining engineering authorities.

Three Zinc Mines in Yell County Begin Operations.

Special to the Gazette. Nov. 14, 1933
Yellville, Nov. 13.—A lease on the famous Sure Pop zinc mine has just been bought by Franks & Franks of Marshall. The new operators, who have for several years been engaged in highway construction work, are moving some of their idle road and bridge construction equipment to the mine for immediate use in mining operations.

Before selling the lease the former owners had recently mined a car load of high-grade carbonate of zinc which is awaiting shipment. Plans of the new lessees involve the sinking of a shaft to tap the lower ore run that is known to exist below the valley level, while mining is to be continued also on the upper run which has been proven by tunnels extending 1,200 feet into the mountain, and from which workings more than three-quarters of a million dollars worth of zinc ore has been produced and sold.

The Sure Pop is the second zinc property that has passed lately into the hands of contractors on road construction. G. W. McClain recently sold a lease on his Lone Star mine to a new company composed of contractors. Operations on this property have been started and are showing up a rich body of ore.

A company of experienced miners here has set up camp for regular operations at Mine Sixteen, which recently was acquired under a lease of 10 years. This mine was opened when the depression began. During development operations its record of production totaled approximately 500 tons of free ore that were shipped without milling.

Lead Ore Discovered in Mine Opened by General Coxey.

Special to the Gazette. 1933
Eureka Springs, Feb. 3.—Lead ore in paying quantities was struck today at 44 feet in a mine being opened by Gen. Jacob S. Coxey and associates five miles from here. General Coxey recently returned from his home in Massillon, O., to be near his mining activities. Tomorrow he will make a long planned visit to Monte Ne to see his old friend W. H. ("Coin") Harvey.

Zinc Mining Properties Near Yellville to Be Worked.

Special to the Gazette. 2-23-34
Articles of incorporation for the Boone Lead and Zinc Mining Company at Bergman, capitalized at \$10,250, were filed with the secretary of state by Lee Buie and C. L. Franks of Keener, J. E. Franks of Yellville and Curtis Cox of Bergman. The company proposes to develop and ship lead and zinc ore from mines in Boone county.

Zinc Mining Properties Near Yellville to Be Worked.

Special to the Gazette. 27-1934
Yellville, Nov. 27.—A contract has been closed on 500 acres of developed zinc mining property in the Buffalo river district, near Yellville, between a local development agency and mining and industrial engineers of Tulsa, Okla., whereby the latter will organize a company to develop the properties and equip the mines for commercial operations. An appraisal of the extent of ore deposits on the properties was made. The appraisal shows the existence of an unlimited ore supply, the grade carrying a premium of eight points, which is equivalent to \$4 a ton extra on the Joplin market.

Carload of Zinc Ore Shipped From Rush.

Special to the Gazette. 7-8-34
Yellville, Jan. 7.—The first carload of zinc ore to be shipped from the North Arkansas district this year, was billed out from the Yellow Rose mine at Rush by Dirst & Son last week. The ore is high grade, free zinc carbonate, ready for shipment as it comes from the mine without having to be milled. During war-time mining operations, the Yellow Rose shipped more than 2,000 tons.

Operations are being made on a rich ore run that was missed by the old mine tunnel. In the opinion of local miners, the main ore body on that property remains to be mined. When the Yellow Rose and other mines in Rush district formerly were operated it took a day and a half for a team to make a round trip to deliver a ton of ore to Yellville shipping point, whereas, the recent shipment from there was hauled over the new highway by truck on a schedule of four round trips a day and carrying about two tons a load.

Franks & Company of Marshall, the first road contractors to become actively interested in mining here, have a shipment of fine ore on the docks at Yellville. Within the past 30 days, contracts were consummated through the Ozark Mine Owners League here with interests in the Oklahoma field, also in Wilmington, Del., involving 1,600 acres of approved zinc and lead leases for development.

Yellville District Zinc Ore Commands Premium.

Special to the Gazette. Feb. 27, 1934
Yellville, Feb. 23.—S. O. Denton & Co. have received returns on a car load of free zinc carbonate ore shipped from the Lone Star property at Maumee. The ore was above standard grade and commanded a premium. While mining and shipment of free ore, several hundred tons of rich milling ore was taken out and stored on the mine dump. The operators plan to install a small mill at the mine to realize on all ore produced as further development work proceeds.

Wingate & Helms, operating at the Onwata mine, north of Yellville, are assembling a carload of zinc carbonate ore here for shipment since the price was advanced. Miners who are developing a lease on the Big Buck property recently made a rich strike as their tunnel entered a vast chamber of zinc ore.

Dirst & Co. are mining a second carload of free ore on the Yellow Rose lease at Rush where an important new find was made recently.

Corrects News Item Concerning Shipment of Zinc Ore.

Special to the Gazette. March 1, 1934
To the Editor of the Gazette: Referring to a news item in the Gazette of February 24, headed "Zinc Ore From Yellville District Commands Premium," it later appears that the report was in error as to a shipment made from the Lone Star mine in Searcy county. Final returns showed this ore below standard grade, and it did not bring a premium, which is out of the ordinary for zinc ore from the Yellville district.

Being mindful of the facts, I am prompted to offer this correction in order that no undue credit may be claimed for any particular free ore mine operator, as was done in this instance.

The facts about the Yellville district are good enough for the local zinc industry to stand on without exaggeration. With approximately 50,000 tons of zinc ore having been shipped from this district during the war period, smelter returns on sales showed these ores to be of uniform high grade to six points above standard.

In some instances failure to cull out waste matter from the free ore before shipment without milling has resulted in lowering the average grade of certain lots on smelter assays.

J. H. Hand.
Yellville, Ark.

Zinc Concentrating Plant to Be Built Near Bergman.

Special to the Gazette. March 30, 1934
Bergman, March 29.—Lee Buie, a mining man formerly of Zinc, is building a small zinc concentrating plant on the Bailey land at Elixir Springs, about eight miles north of this place. He has a promising mine of jack and zinc carbonate, and expects to keep the mill running when he completes it. This is the first new plant to be constructed in the north Arkansas zinc field since 1916.

bank.

FINDS ZINC "RUN." 2/3/26
 Marshall, Feb. 3.—(Special.—) Ber-
 ry H. Ragland of Marshall while mak-
 ing a test at his free-ore mine on his
 land, 16 miles north of Marshall, un-
 covered a new body of carbonate of
 zinc that run from five feet to ten
 and one-half feet thick and is 300 feet
 wide, he claims. Mr. Ragland has sev-
 eral hundred tons of carbonate zinc
 piled up at his mine in readiness to
 be hauled to Marshall for shipment
 as soon as the roads are in shape for
 heavy hauling.

Democrat 2/3
FOR

BIG ZINC FIELD IN ARKANSAS LIKELY

Importance Attached to the Strike on Lease in Lawrence County.

BIG MILL IS POSSIBLE

Memphis and Pine Bluff Capital Reported to Plan Extensive Development.

Special to the Gazette. 1926
 Walnut Ridge, June 11.—A strike of zinc made near Black Rock, in shaft No. 1 by the Campbell-Heinz Company has aroused considerable interest since it is believed by experts to prove the existence of a zinc field in this vicinity which may prove as valuable as the Joplin (Mo.) and Picher (Okla.) fields. The strike verifies the reports made on various test holes in that vicinity and the shaft is from a geological standpoint the deepest in the Ozark range.

The Campbell-Heinz Company leased the property on which the shaft was sunk from the Consolidated Zinc Company. The Campbell company is backed by Memphis and Pine Bluff capital. It is reported that the company will erect a large mill or concentrating plant, so that even by-products may be utilized.

This is the nearest rock formation to Memphis and the adjoining portion of the Mississippi valley and representatives of large lead and zinc companies are showing interest in developments. A number of mineral leases and real estate transfers have recently been recorded.

B. J. Campbell, of Memphis is president of the Campbell-Heinz Company and C. P. Stanley is secretary-treasurer. Associated in the company are Henry Loeb Sr., Junius Jordan, Howard Strauss and W. S. Campbell, all of Memphis, and John I. Fowler of Memphis and Pine Bluff.

STATE RANKS HIGH IN OUTPUT OF ZINC

Arkansas Boasts of Being Fourth in Production of Mineral.

HAS THREE BIG SMELTERS

Largest Array of Furnaces West of Mississippi River Said to Be at Fort Smith.

By Fletcher Chenault.
 (Staff Correspondent of the Gazette.)

Fort Smith, April 23.—One of the cherished prerogatives of a chronic booster is the authority to speak jauntily in Big Figures; the renowned Colonel Sellers established the precedent with the phrase: "There's millions in it." And in Arkansas there are statistics galore to sooth the mind of the most irrepressible, bright-eyed optimist.

These statistics prove, for example, that Arkansas is near the top of the list of states in the annual production of such products as cotton, rice, timber, coal, gas, oil, bauxite, apples, peaches, strawberries; that Arkansas has the only diamond mine on the North American continent and the only scissors factory west of the Mississippi river; that Arkansas supplies most of the hickory for automobile spokes and most of the oak and gum for Singer sewing machines, and that in Arkansas are the most famous of the country's hot springs. Arkansas is the only state west of the Mississippi river with a newspaper more than 100 years old, and it is the only newspaper that has sent its handsomest reporter out to pry into community affairs for matters of interest to those patriotic citizens who have nothing better to do than to read the articles.

Zinc Smelters at Twin Cities.

Returning to Big Figures: We should not forget that Arkansas is fourth in the production of zinc and that the three big zinc smelters of the state are established in Fort Smith and Van Buren. Nor should we lose sight of the fact that one of these—the Athletic Mining and Smelting Company—has the largest array of furnaces of any smelter west of the Mississippi river. So much for the figures.

The Athletic Mining and Smelting Company has four furnaces with 416 retorts on each side, or 832 to the block, a grand total of 3,328 retorts. It has four dry kilns 190 feet long and 14 feet wide and eight tanks of a capacity of 100,000 pounds each. These are, you must admit, mere big figures; but if you could see the workmen dumping bright metal ingots into the box cars like so many brick you would not doubt the industrial significance of the plant, and the other smelters to Arkansas.

The zinc plates are 18 by 9 inches in size and each weighs 57 pounds. Some people persist in referring to them as spelter, but the correct definition is a four-letter word meaning a bright metal; or, if your comprehension is dull, plain old zinc; and it goes to the rolling mills to serve a variety of purposes.

To be exact, a multiplicity of purposes. For one thing it is converted into the points for your shoe laces; it is mixed frequently with brass and galvanized iron; it goes into high-explosive shells, plumbing equipment, medical instruments, and many other things. It is an indispensable product and it runs through the hills of north Arkansas in almost solid veins.

Source of Supply.

Most of the zinc that reaches these Fort Smith reduction plants, however, comes from the Joplin district. The Arkansas mines are handicapped by inaccessibility. A great deal of coal is used, however, and it is Arkansas coal.

The retorts belch hundreds of blue, white and yellow flames. There is only one place hotter than these furnace rooms and our Sunday school training restricts the use of a word to designate it. Piles of zinc ore lie heaped up like sand. It is crushed into fine particles and the zinc in these piles glitters like bright crystals. A precious metal, and precious hard to prepare for industrial use.

Mixed with coal, coke, salt, and what not, it has the appearance of concrete and sand as it is heated and moved by automatic machinery on through the kilns. Eventually it reaches the furnaces; eventually it comes out in bright ingots; but this smelting process is difficult to describe—too difficult for any writer born with a talent for aristocratic ease and relaxation.

The manufacture of these heat-resisting clay retorts by machine molds is a big industry in itself. St. Louis fire clay is used, but it might as well be Arkansas clay. Some one ought to look into that for Arkansas has just as valuable heat-resisting clays as may be found anywhere. Arkansas has, in

Is Much Activity in Mining Near Zinc.

Special to the Gazette. 1926
 Zinc, April 24.—Conditions in the north Arkansas zinc and lead field are growing better. In March, many leases changed hands and new properties started operations.

Operations in this camp are becoming active again. The Oklahoma concern, that leased the Coker Hollow mine, has a force of men at work sinking a new shaft on the property. Every shot shows ore, and they expect to open up good working faces in a short time. W. C. McCurry, an old operator in this field has taken a lease on the Rhodes property which is equipped with a mill. Work has begun in the ground and the mill will be started as soon as enough ore can be blocked out to insure its steady operation.

J. S. Ragland and associates who have a lease on Hoosaw Creek, between this place and Bellfonte, have opened up a big body of zinc carbonate and are making shipments from Olvey. Lon Brown, a pioneer operator in the field, has taken a lease on the Jack Pot mine and has a force of men at work on the property making ore. Cantress Bros. of Lead Hill, who hold a lease on the Coon Hollow property, contemplate starting operations soon. They plan to clean out and enlarge one of the old tunnels on the property and drive it into the heart of the mountain.

Geologists Visit Lawrence and Sharp Counties.

Special to the Gazette. M. 11-5-29
 Hoxie, Nov. 4.—R. S. Willitts, local geologist, has returned from a five-day trip through Sharp and Lawrence counties with Edwin E. McKnight of Washington, D. C. They visited the gas, oil and mining districts of the two counties, gathered information for the government concerning prospective developments.

Mr. McKnight has been working in Arkansas for the last two years, gathering information for publication. It will be several months before the final report is ready for publication. One hundred and forty lead and zinc mines and drill holes were inspected in the two counties.

fact, nearly any raw material you could name.

One Plant in Operation.

The Falton Zinc Company of Van Buren is in full operation but the Fort Smith Smelter Company has shut down as the result of litigation. The company brought suit on its contract for gas, and was sued in turn by a farmer nearby who alleged that the smelter ruined his crops and rendered his land valueless for agricultural purposes.

The Athletic Mining and Smelting Company answered the usual complaint that smelters ruin plant life in a given area around them by establishing visual proof to the contrary. The company has an 80-acre orchard adjoining the smelter where young peach trees are flourishing. Flowers also bloom in the yard in the shadow of the smelter buildings.

A. P. Schonsaerts, superintendent, was born in Belgium not far from the great Belgian and French iron

minutes that were flooded by the Germans. The plant's furnaces never cool; a laboratory is maintained to test the ore as it comes in, and every piece of metal that goes out is stamped with the name of the smelter and its location.

They go to the East and abroad "swifter than an arrow from the Tartar's bow," and each and every one is a substantial advertisement for the great state of Arkansas.

Ozarks Have Fascinating Underworld all Their Own

By RALPH A. HULL.

Ponca, March 28.—Crime practically is unknown in this sparsely settled Newton county section where hillside farms and timbered slopes are from 1,700 to 2,100 feet above sea level, but they have their underworld hereabouts, just the same.

It is a world of tunnels following veins of lead ore into the hearts of mountains and of subterranean caverns whose crystal formations are beautiful beyond description. In some instances the tunnels and caverns interlock, for miners burrowing with drill and dynamite now and then break through the walls of caves which have no other outlet.

Lead mining in this region is an industry beset with difficulties, discouragements and small profits, considering the present price of ore, but to students of nature and the wonders nature can perform it has its compensations.

One of these compensations is the privilege of being the first to view these caverns—an experience which carries with it the thrill an explorer gets out of discovering new worlds, as it were. Another is the opportunity presented to seek and find fossil deposits which date back to the time ages ago when all this section of the Ozarks was a part of the floor of an ocean.

Four Mines Operating.

Four mines now are being worked on a small scale near Ponca, their owners firm in the belief that the market will improve and that other developments will make their labors worth while financially, eventually. Several other workings have been abandoned, but only temporarily.

The developments looked forward to include the prospective building of a series of dams and locks along Buffalo river which not only would supply plenty of hydroelectric power but make possible the transportation of ore by barge to mill or smelter. Thus far this development has not gone much beyond the "paper" stage and some of it not that far.

Also, since there are numerous traditions of lost silver mines in the Ozarks, and there is a small percentage of silver

in most of the lead taken out, there lurks in the back of the mind of almost every lead miner the hope that he will some day strike a pay streak of silver.

In the meantime, however, mine operators are trying to "break even" until the better day arrives and some of them are getting quite a kick out of a first hand study of geology and geophysics.

Locomotive Engineer Is Miner.

One of these amateur scientists is Ross McCullough of Harrison, locomotive engineer for the Missouri and North Arkansas railroad. He is a partner, with three other men, in the North Arkansas Mining Company which owns a 40-acre lease about a mile and a half from Ponca and which has been operating a mine on the property for six or seven years.

Mr. McCullough has put several thousand dollars into this mine in the half-dozen years it has been worked, and he never has realized a profit. But, according to his own assertion, he "certainly has got lots of fun out of it."

The engineer's enthusiasm is of the kind that brings him out to the mine from Harrison whenever he can get a day off between his freight runs. He "rests" by taking a prospector's pick and climbing the mountains in search of new veins of ore, or by handling a sledge or drill in the mine tunnel. His vacations are spent the same way.

Finds Interesting Fossils.

Despite his interest in lead ore Mr. McCullough overlooks few opportunities to pick up or dig out fossils and those he has found, if put in one collection, would constitute one of the most com-

prehensive in the state. One of the rarest of the fossils is that of a turtle, marine or otherwise. He also has a large fossilized mussel shell found on top of the mountain, and numerous smaller shells of various kinds. These are in an exhibit of minerals and fossils he has on display in the lobby of the Hotel Seville in Harrison. Other specimens collected by Mr. McCullough are in the Arkansas Museum of Natural History in the city hall in Little Rock.

Mr. McCullough's partners in the North Arkansas Mining Company are "Shorty" Coe, tavern keeper of Ponca; Dave Fancher, erstwhile sourdough of Alaska, and the Klondike, and Sam Clark, Newton countian. The four work the mine on a co-operative basis, each furnishing materials or labor and then dividing the profits, if any.

Ore Trucked 28 Miles.

The mine is three-quarters of a mile from the Harrison-Clarksville highway. The last quarter of a mile cannot be traversed by truck. As a result a wagon, drawn by mules, transports the ore to the nearest point available to a truck, and the ore then is reloaded for shipment over the highway to Harrison, a distance of about 28 miles.

At Harrison the ore is loaded into freight cars and shipped by rail to smelters in Joplin.

The North Arkansas Mining Company's workings at present consist of a

shaft 25 feet deep from which a tunnel 540 feet long leads back into the mountain. An older tunnel following a rich vein of ore was "lost" some time ago when a cave-in blocked further efforts of the miners. A new shaft, back of the cave-in now is being sunk in an effort to reopen the old tunnel.

Break Into Cavern.

It was in the present mine tunnel that the last and one of the most beautiful limestone caverns was encountered. The cavern is not large, as caves go in this country, but in it are some formations unique in this region. The miners broke through its walls about 250 feet from the opening of the tunnel at the shaft.

The cave is approximately 65 feet long; from four to 20 feet wide and from four to 12 feet high. On the floor limestone formations, snow white and glittering like diamonds, rise in stalagmites of the usual type, or like mushroom rooms with hundreds of tiny spikes pointing upward. The usual stalactites drop from the ceiling, but of more interest to the visitor are the formations growing out from the sides of the cave. These take many shapes, but predominant are limestone growths which resemble deer, elk or moose horns which appear to have been mounted on the walls like hunting trophies in a sportsman's exhibit.

On the floor of the cave, and also in the mine tunnel, is a peculiar red clay. It is of about the consistency of soapstone, entirely free of grit, slightly oily and when first removed will take a rich, high polish. Exposed to the outer air and elements, however, the clay soon disintegrates. Whether it has any commercial value has not been determined.

Rock Eggs Grow in Cave.

At many places in the clay on the cave floor have been found what Mr. McCullough calls mineral eggs. These are of limestone, yellow, translucent and almost perfect in their symmetry.

"It is such things as this," Mr. McCullough remarks of the cave, "that makes our efforts worth while, even when we don't make any money. Take these limestone growths, for instance. They are a part of nature's way of healing a wound. At some time, thousands, or maybe millions of years ago, an upheaval of some kind left this hole in the bowels of the earth. Nature set about filling this hole. If we had not disturbed it with our mine tunnel the cavern some day would have been completely filled with limestone.

"Another thing of interest to me is the discovery of how minerals grow. Many people have the impression that deposits of lead or other mineral are the result of some ancient volcanic disturbance or other sudden change in the crust of the earth. All wrong! The minerals we find are constantly being formed and deposited where we find them. Chemical reactions within the earth are responsible for the formation of the minerals and the elements needed for each mineral usually are carried to the point of deposit by the water which constantly is flowing underground.

Three Other Workings.

Besides the mine being worked by the North Arkansas Company one is owned and operated by a partnership composed of Ed Minicus, Jess Schroll and Jim Gunn; another is being worked by Brit Keaton, and a fourth is known as the Brewer mine.

The Minicus-Schroll-Gunn group is mining property known during the World war as the Kilgore lease, a property which is reputed to have netted Ike Kilgore of Kilgore, Newton county, \$30,000 in two years. Mr. Keaton subleases a part of this property and re-

cently struck one of the richest veins of lead ever found in this section.

A small mill is operated on the old Kilgore lease to take care of lower grades of ore which always are found in connection with the high grade mineral, but most of the ore is shipped just as it comes from the mine.

The price of raw lead is based on ore 80 per cent pure, and all ore which assays higher than 80 per cent brings a premium. The last two cars of ore shipped from the North Arkansas Company's mine assayed \$4.80 per cent and \$4.30 per cent pure, respectively. Nearly all ore mined in this vicinity assays above 80 per cent.

ZINC-SMELTING GAS MAY BE IMPORTANT

State Geologist Branner Sees Possibilities in Bureau of Mines Discovery.

Discovery that natural gas may be used more cheaply and easily than coal gas to smelt zinc may prove of the utmost importance to Arkansas, which has abundant supplies of both natural gas and zinc. The discovery was announced by the Bureau of Mines in Washington yesterday.

A four-year survey of the zinc ore deposits in northwest Arkansas by the Arkansas Geological Survey and the United States Geological Survey is nearing completion and the report will be in the hands of the printers by November, it was said by State Geologist George C. Branner yesterday.

This report will show not only discovered deposits of zinc, but will include facts regarding geological formations in which zinc is found which may lead to the discovery of more and larger deposits.

It is an established fact that there is an abundant supply of zinc in the area extending from Batesville to Fayetteville, with Yellville the "zinc center" of the territory.

With the large supply of natural gas available in the Clarksville field, zinc could be smelted from the ore at, or near, the mines, thus saving the great expense of shipment of ore, Mr. Branner said.

Low Price Unfortunate.

Unhappily, the price of zinc is now down to 3.2 cents a pound, a new low which practically has arrested the mining and smelting of zinc in Arkansas. Only one plant, the Athletic Smelting and Mining Co. of Fort Smith now is operating.

Between 1900 and 1929, Arkansas produced \$5,276,014 worth of zinc, most of it during the war years of 1916 and 1917, when the price was approximately 20 cents a pound. The state's peak production was in 1916, when the output totaled \$1,836,430. Natural gas has been used in Arkansas for some time in the process of smelting zinc, but only to produce heat. The new process would utilize natural gas chemically to transform the zinc in the ore into a gas also, later to be deposited as almost pure zinc.

Eighty per cent of the zinc discovered in Arkansas is in carbonate form, whereas in most other states it is in the form of sulphides. Mr. Branner said he could not say, without investigation, whether the new process would act equally as well upon both forms of ore.

Discovery May Revolutionize Zinc Industry.

Washington, July 25.—(P)—The zinc industry may be revolutionized by a discovery that natural gas can be used to smelt the metal more easily and cheaply than present processes, says the Bureau of Mines.

The new process, using natural gas instead of coal gas to remove zinc from the ore, was developed by Charles G. Maier, metallurgist of the Pacific Experiment Station of the bureau. It resulted from a three-year study of ways to improve the quality and reduce cost of production of zinc.

In Maier's process the zinc ore is placed in a large tube, heated by an electric furnace to about 1,000 degrees Centigrade. The natural gas, purified, is fed in from above. The chemical action of the natural gas transforms the zinc in the ore into a gas also. The combined gases pass on into a condenser, where the zinc is deposited as metal that is 99.99 per cent pure.

The Chinese are believed to have originated zinc smelting before 600 A. D. This is the first radical improvement in the process since then, the Bureau of Mines says.

The Maier process permits more economical use of fuel and requires less heat than existing methods. It permits use of larger reduction units, which can operate continuously, ash being removed from below and new ore added from above without interrupting the smelting process. The smelters now in use must cease operation from time to time for cleaning.

More and better zinc is recovered with the new process, bureau officials say. Less labor is required and maintenance costs are reported to be lower. Zinc is widely used for roofing because weather has little effect on it. It is used as a coating for "galvanized iron" to prevent rust. Brass is made from a combination of zinc and copper.

Missouri, Oklahoma and Kansas are the largest zinc-producing states, but it is also mined in Arkansas, Colorado, Idaho, Montana, Nevada, New Mexico, New York, New Jersey, Tennessee, Utah and Virginia.

Gopher Mining Being Resumed in Yellville Area.

Special to the Gazette. 10-28-31
Yellville, Oct. 24.—Gopher mining again is making its appearance in the Ozark district around Yellville. Tight money and slack employment have stimulated prospectors to shoulder their picks and go to the hills in quest of mineral treasures from which many ore diggers wrested prosperity in former times. With the price of lead now around \$2 per hundred pounds, it does not require much of an ore streak to yield an experienced miner \$2 to \$8 a day, digging free ore from a surface prospect.

Many of the ore bearing stratas that crop out along the hillsides are interspersed with veins and chambers of free lead that is ready for market in the form that it comes from the ground, and the trained prospector is able to follow the ore trend with almost as true accuracy as the farmer digs his row of potatoes. Out in the Short Mountain district, north of Yellville, new prospects are being uncovered and old diggings reopened with gratifying results.

In cutting a new entry to an old drift, the two Markel brothers took out 1,000 pounds of free lead in two days. Helms and Estes, who reopened an old prospect on a new level at the Onwata property, have taken out a carload of free lead, besides an equal quantity of high grade carbonate of zinc since they laid their crops by in June. Although the price of zinc carbonate is below normal, yet a ton of that ore is worth nearly as much as a bale of cotton. During the hard times of 1913-14, when nothing else could be found to do, a few courageous prospectors here tried their luck at gopher mining. From that humble start, a flourishing industry grew up in mining which gave employment to hundreds of men and returned some \$5,000,000 to local producers from ore sales before the slump in 1919.

Farmers Are Mining Lead

Price Is Up and Money From Ore Supplants Timber Revenue.

St. Joe, Oct. 28.—(Special.)—A rich lode of zinc ore has been opened during the past week on a prospect claim, 18 miles due north of St. Joe, in Marion county, by Marvin Estes and Hugh Helms, who have named their mine the "Big Buck." They have leased a considerable tract of land in the neighborhood of the claim, which is on the east side of the Wolf Ppen branch of Jinnies creek. Large pieces of chunk ore are being taken out.

With a good price being paid for lead ore, many small prospectors and miners have taken pick and sh-

and gone into the hills to dig out free ore. This consists of chunks of lead ore embedded in clay and other formations. While they are not able to make large returns, those small prospectors and miners earn from \$2 to \$10 a day, which in these times of unemployment they consider good wages.

So general is the distribution of this free ore in the hills of northern Searcy and southern Marion county that many farmers having these deposits on their farms are beginning to dig them and ship co-operatively to make a carload. One farmer north of here stated that his ore digging would

supply the revenue that was formerly brought in by the sale of his timber in the shape of cross ties and stave bolts.

MINING PROPERTIES TO BE DEVELOPED

Corporation Will Operate 1,000 Acres in Vicinity of Yellville.

Special to the Gazette. Yellville, April 27.—Announcement has been made at Dover, Del., of the incorporation of the General Mining Corporation by F. T. Robinson & Co. of Wilmington, Del. F. T. Robinson, president of the firm of Robinson & Co., also is president of the new corporation. J. H. Hand of Yellville is named as vice president and general manager at mines, and Capt. Charles LeVasseur of Yellville, consulting engineer.

General Mining Corporation has an authorized capital of \$100,000 to develop and operate 1,000 acres of zinc and lead properties near Yellville. The project contemplates early extension of developments at mines which are proven, with a view to equipment with concentrating mills of 1,000 tons daily capacity. Some of the company's properties made substantial productions of ore from preliminary development operations during the war period of mining activity in this district.

Another policy of the corporation, it is said, will be to encourage development of local mining industry through subleasing small tracts of its holdings that show merit to other operators, and contract to buy their ore. Under this plan the "grub-stake" miner who needs a helping hand to get started will find aid that doubtless will lead to the production of important ore values from new projects to be opened, it was said.

Rush Zinc Miners Ship Car Of Free Ore.

Special to the Gazette. Yellville, May 5.—Dirst & Sons, operators of the Yellow Rose zinc mine at Rush, loaded out a car of free ore here this week, consigned on contract to Grasselli Chemical Company of East Chicago. They also shipped a quantity of high grade ore which had been bought in small lots from other local operators on Sure Pop, Big Buck and Markle properties which are yielding pay dirt with development. Franks & Company have completed a small mill on their lease at the Bailey mine in Elixir Camp, five miles east of Bergman, where a rich deposit of zinc sulphide ore is being opened. M. O. Gilley and associates recently started work under a lease on the Aztec mine in the Rush camp. The first round of shots brought out high grade zinc carbonate.

Yellville Men to Reopen Zinc Mine at Rush.

Special to the Gazette. Yellville, Sept. 19.—The McIntosh zinc mine at Rush has been leased by a local company composed of E. A. Adams, K. F. Reed and H. C. Keeter, miners. Owners of the property live in Boston, Mass. The McIntosh joins the famous Morning Star group of mines, purchased some years ago by capitalists in Pittsburgh, Pa. The new operators are to begin mining zinc ore at once. This work will be carried in free ore mining fashion, since the deposit of zinc is so pure that a large proportion of the run is ready for sale as it comes from the mine, without having to be milled. The product will bring about \$12 a ton on the local market at Rush, under prevailing prices. On that basis, good miners will clear \$3 to \$5 a day.

MINING INDUSTRY INTEREST REVIVED

Lead and Zinc Properties in Ozark District Again in Demand.

Special to the Gazette. Yellville, May 30.—Revival of interest in development of zinc and lead mining industry in the Ozark district is much in evidence, as leases become more in demand by local free ore miners and prospective commercial operators. Among active major movements are operations at the Lonnie Boy mine in Rush camp, headed by W. C. Urschel of Bowling Green, O., who has started sinking a shaft to open up the proven ore body for active mining, and is putting machinery on the ground for a 100-ton concentrating mill. Mr. Urschel and associates also are developing a lead mine at Ponca, Newton county, on which they have erected a small mill.

Ross Hicks, with a small crew of free ore miners at the McIntosh property in Rush camp, has mined three carloads of high grade zinc carbonate which he is preparing to truck to railroad at Yellville for shipment on an order from an Eastern smelter.

Dirst & Sons, having recently obtained a lease on the LaRue property which joins the noted Philadelphia and Leader mines near Rush, are opening one of the richest bodies of zinc sulphide ore that has been found in this field, and have begun negotiations for equipment of this property with a mill.

Recent steady advance in the price of zinc, together with the outlook for increased consumption of that metal, has stimulated inquiries from the outside for properties on which large mining enterprises may be established in the

Ozark district. With the former handicap to mining, such as bad roads, now removed, and assurance of adequate low cost power now available to local mining industry, prospective operators who have investigated the situation are convinced that zinc ore can be profitably produced here in competition with that of the older mining fields.

Zinc Mining Comes Back

Resident Miners in the Ozark Mineral District Have Conquered the Depression and Crop Failures by Working New Diggings, Profiting Under Increased Prices.

July 14, 1935 By EDITH MAE HAND

The Ozark district in northern Arkansas is one of the richest areas of zinc deposits in the United States having ore free from iron, manganese and other mixtures that impair the quality. In his report of early investigations in this field, the late Dr. John C. Branner, former state geologist, said: "The extent of these ore deposits is so great that it is unknown." That conclusion stands corroborated by other eminent geologists and mining engineers who have made later investigations.

During the World war the Ozark district supplied 100,000 tons of zinc ore from new prospect workings, most of which financed their own development and equipment from their initial and current outputs, besides paying liberal profits to the operators.

With the collapse of the industry at the close of the war, this district, having been operated primarily upon short-time lease rights, closed down. Mills were removed by lessees and much of the field has since been idle.

Now, however, a new boom is under way. Rather than seek government relief through the numerous New Deal agencies, men—both young and old—have sought the rich zinc fields, and with little more than a grub stake to begin on have developed numerous mines.

The reason the industry has been so slow in coming back has been due to two factors, bad roads and the fact that the older mining interests were able to supply normal demands for zinc and to anticipate future requirements years ahead. Hence, there has been no economic justification for the development of new sources of production, except under extraordinary demands. Buyers were dilatory about taking ore from new places and then wanted to squeeze the price.

In view of the upward trend of the automotive and other industries, increased future requirements for zinc and lead have focused attention of thoughtful investors on the metal industries. This is in



A zinc mine in the Rush district of the Ozarks.

no wise surprising, for with the applications of zinc such as are required in metal galvanizing, dye-castings, batteries, chemical compounds, paints, automobile tires and a multitude of other purposes, mining enterprises are experiencing renewed stimulus, with prospects for better returns in the future.

Hence, attention logically responds to the call of new mining fields. The early development of new mines will be imperative—not only to the life of the zinc industry itself, but to many branches of manufacturing industry as well. Hence, the Ozark district steps into the foreground.

During 1934 a substantial output of zinc carbonate ore and some lead were mined and shipped by individual resident operators, who were mining in a small way at several rich diggings in the district. The aggregate of these operations amounted to several carloads during the year. A fair profit was realized on the whole, which helped to tide the various workers over many hard problems during the year. Some of these pick-and-shovel miners dug out only a few tons, while others succeeded in making carload shipments.

Zinc has shown a strong comeback since the business upturn in 1933 and has almost doubled in price. Thus, a healthy position of zinc mining industry for the future is apparent.

The famous Morning Star mine from its several thousand feet of underground workings has produced and sold over \$1,000,000 worth of high-grade ore, including the world's largest nugget of pure zinc ore, which weighed 12,600 pounds.

Other examples taken at random are the Silver Hollow mine tunnel, which penetrates pay ore to its full reach of 1,300 feet from surface outcrop, and ends in the richest ore face yet encountered on its course, while thousands of tons remain exposed in the floor and side walls.

The main tunnel of the Philadelphia mine ends in its richest ore deposit over 1,500 feet into the mountain. The fact that over \$500,000 worth of zinc has been sold from there would indicate that the deposit was found to be continuous. Other notable examples appear in the Edith mine with a record yield of 20 per cent of milled zinc concentrates, recovered from its 1,000 feet of tunnel and crosscuts, showing the ore run over 800 feet in width.

During the first six months of operations at the Sure Pop mine, sufficient free ore was produced and sold to pay for the property and install a modern concentrating plant. Ore sales from this mine have exceeded the three-quarter million dollar mark.

A shaft was sunk to the 160-foot level on a "fissure" vein of zinc sulphide at the Bear Hill mine. At three different levels cross-cuts were extended in all directions from the shaft. Rich ore in commercial quantities appears throughout the extent of all these workings.

The Yellow Rose mine returned over \$200,000 in marketed ore values from a mined area of about two acres. Yet the ore bodies in these mines have but barely been scratched. These conditions are but typical of many other places awaiting further development. Upon investigation the Lonnie Boy, Leader, Capps, Old Wood, Onwata, Dixie Girl, and numerous other properties in the district equally worthy of notice, one finds that ample proof of workable free ore deposits is supplied from former shipments and ore remaining to be seen around old workings.

Under the caption, "Arkansas Resources Invite Mining Exploration," the Commerce and Industry Magazine of New York, in 1934, commented on the exhibit from this district which was installed in October, 1933, at Chicago, as follows:

"An interesting sidelight on the recent Century of Progress Exposition in Chicago was the display of minerals in the Arkansas section of the Hall of States. It offered first hand evidence of the rich mineral deposits of a state which has, as yet, not been sufficiently exploited. But it seems that the picture will be changed in the near future. Organizations have sent representatives to substantiate the exhibits and from reports at hand, mining on a large scale is practicable. Zinc and lead resources in particular have been studied, and the true vastness of Arkansas resources in these metals is coming to light."

This is but a part of an article of some length which was voluntarily prepared and published by that magazine, after its representative had viewed the exhibit and read accompanying literature on the Ozark district.

The ambitious operator in the Ozark district is becoming master of his own future by seizing the opportunity now open. Users of high-grade zinc are now ready to buy the carbonate ore, for the first time in a long while. Practically every mineral section in the district is connected with a rail shipping point by modern roads over which auto trucks may move rapidly with capacity loads. A light truck will move six tons of ore to the railroad in a day, whereas it formerly took a day and a half to move one ton by wagon.

Numerous are the examples of successful pursuits by individual miners and small groups of men as they stayed with their prospects and followed the "pay streaks" that led on to richer channels of natural wealth in the Ozark hills.

Three miners at the Yellow Rose have been taking out more than a ton of free

ore a day without any equipment, getting their diggings in shape. At start they made perhaps 500 pounds a day. Over \$200,000 in zinc ore values has been produced from two acres of mined area on this property.

Two miners whose truck crops had burned out during the drouth of 1934 pitched camp and went to work on a prospect dig known as the Aztec in the Rush creek mountains, south of Yellville. In 30 days they obtained a stack of free zinc ore worth \$200. With glaring ore faces exposed in the workings, the Aztec is

among the outstanding potential mines inviting mill equipment.

A Pole dropped off the train at Yellville, and took a lease on a nearby prospect. Within a short time he had mined and shipped approximately \$5,000 worth of free zinc ore from what is known as the Shawnee mine. After the prospect had been developed to the milling stage, the lease was sold at a profit.

Another practical miner obtained a lease on a promising zinc property known as Mine Sixteen. With the help of one man, he produced and shipped five carloads of free ore, besides removing 1,000 tons of rich milling dirt from 500 feet of tunnels and cross cuts.

During the latter part of 1934, enterprises were formed under experienced mining management to reopen two or three well-proved mines in this district. In one instance, machinery has been purchased, while equipment for another is being provided.

There are some who would discourage the miner and investor by maintaining that the price of ore is too low to justify mining now. Zinc sulphide is worth about \$30 and carbonate about \$20 a ton. When the Red Cloud mine at Rush was operated in 1908 and 1909, the pay roll for the mine and 150-ton mill and other operating charges were carried from mine earnings on \$17 ore. Cost of transportation and power were then more than twice what they would be now.

Zinc Mine in Rush Camp to Be Operated Again.

Special to the Gazette. Yellville, Aug. 2.—The noted Silver Hollow zinc mine in the Rush camp has been leased to a syndicate of which Chancellor Elmer Owens, Attorney J. H. Black and J. C. Dirst, until recently of Washington, D. C., are local members. Mr. Dirst, who is an experienced zinc miner, is sanguine over the possibilities for profitable ore production at this mine on a large and permanent scale. In the course of former developments, the main tunnel was extended on the rich ore body, 1,300 feet into the mountain and cut through pay ground from surface to heading. During this operation, about \$500,000 worth of zinc was mined and sold, and it is estimated that \$1,000,000 of ore values remain reasonably in sight.

Rich Body of Zinc Ore Found In Yell County Mine.

Special to the Gazette. Yellville, Aug. 14.—Hicks & Robertson shipped a carload of premium grade zinc carbonate ore from the McIntosh mine Monday. This shipment makes a total of four carloads of free ore shipped from the McIntosh in recent weeks. Mr. Hicks, superintendent of the works at the mine, said that late developments have revealed the richest ore bodies yet encountered in the underground openings, while several more carloads of free ore are in sight. The carbonate of zinc from this property assays six points above par, commanding a premium of \$3 a ton.

Arkansas Zinc and Lead Exhibit For Mining Congress.

Special to the Gazette. Yellville, Sept. 14.—A choice collection of zinc and lead samples is being assembled here from different mines by the Ozark Land Owners League which is sponsoring a display of the Ozark mining district at the American Mining Congress, Metal Mines Division, which will be held at the Palmer House in Chicago, September 23-27. The ore is typical of that found at practically every mine in the district, some of which have made records of extra high grade ore production.

Arkansas zinc took highest rank for purity in quality during the World war when more than 50,000 tons went out from here on orders for government munitions manufacture. It commanded a substantial premium over prices paid for zinc from other fields.

Quicksilver resources of Arkansas also will be featured at the Mining Congress with exhibits from the southwest part of the state, together with manganese from the Batesville-Cushman district. Arrangement of exhibits is under direction of Dr. George C. Branner, state geologist, co-operating with J. H. Hand, special agent for Governor Futrell to represent the mineral interests of the state-at-large, and manager in charge of the Ozark zinc and lead feature.

Zinc Mining on Small Scale In The Ozarks Proves Profitable.

Yellville, Sept. 19.—That the zinc mining industry is "coming back" in the Ozark district is shown by sustained production and shipment of free ore from several properties in the district by local miners during the past several months. These men, with only picks, shovels and hand drills have

mined and sold about 15 carloads of ore which have returned good wages and important developments of new deposits have resulted.

A small crew, headed by Roscoe Hicks, working the McIntosh property at Rush, recently made a rich strike in the heading of one of the drifts from which a rich strike in the heading of one of the drifts from which has been shipped three carloads and two more are ready for shipment. Dirst and associates are opening up a new free ore body at the Silver Hollow mine on Buffalo river. They are getting around a ton a day with two men. A new shaft at the Lonnie Boy mine in Rush camp, operated by H. C. Urschel of Bowling Green, O., entered one of the richest ore bodies opened in the field, showing a deposit 20 feet thick. A mill is being constructed on this property. Mr. Urschel also is mining and shipping lead from the Ponca mine in Newton county.

Charles Smith and associates of Harrison have a fine body of free ore and milling ore opened up at the Lone Wolf mine on Crooked creek, near Bellefonte, where a small mill is being installed.

Local mine ore producers are encouraged by recent offers of material advance in price from chemical works for high grade product. Arkansas zinc ranks higher in quality than that produced in any other state.

Book on Lead and Zinc In Arkansas Available.

Dr. G. C. Branner, state geologist, said yesterday that copies of a new book containing information concerning zinc and lead deposits in northern Arkansas, have been received from the United States Geological Survey and will be sold by the state Geological Survey at cost. Field studies on which the book is based were made by the state and federal Geological Surveys and the publication was edited by Edwin T. McKnight of the federal department.

Another Zinc Mine in Operation In Marion County.

Special to the Gazette. Yellville, Jan. 30.—The Monte Cristo zinc property which was opened by a 1,200-foot tunnel on a free ore vein during the World war has resumed operations.

Control of the mine recently was obtained by a corporation composed of W. E. Krause, Milwaukee, Wis., president; E. A. Bornfleth, Milwaukee, secretary-treasurer, and J. H. Hand, Yellville, vice president and general manager.

During its earlier development the Monte Cristo established a shipping record of 1,500 tons of premium grade zinc ore. The property is proven to the milling stage, and the new company has authorized purchase of machinery. While free ore production will be a feature of immediate operations, it is planned to block out underground workings sufficient for supplying a mill capacity of several hundred tons daily. Engineers say that enough ground is broken to yield returns ample to pay the cost of constructing a concentrating mill. The mine shows two ore runs, carrying both sulphide and carbonate of zinc.

Mining of Zinc Increases In Marion County.

Special to the Gazette. Yellville, March 16.—There is more substantial mining development under way in Marion county than at any other time since the general shutdown of the zinc industry at the close of the war.

Among active operations in the Ozarks field, those at the Monte Cristo mines are outstanding in view of the rich deposits of ore which are being revealed through development extensions, which consist of an 800-foot tunnel into the mountain and other hillside workings.

The Monte Cristo company has contracted for machinery for a 100-ton concentrating plant which is being moved to the mine. The company is owned by Milwaukee men and J. H. Hand of Yellville, who is vice president and general manager. W. E. Krause of Milwaukee is president.

Free ore mining is under way at several other mines, including McIntosh, Leader, Larue, Willett, Prince Frederick and DuVall, while milling operations are expected to resume next week at the Lonnie Boy mine where H. C. Urschel and associates of Cleveland, O., were forced to suspend operations due to recent freezing weather.

A recent advance in the price of zinc spelter to \$4.90 per 100 is regarded as encouraging. For the first time in 15 years the price of zinc held steady through the holiday season and showed renewed firmness with the start of a new year. Since March, 1932, the price of zinc spelter gradually has climbed from \$2.60 to \$4.90 per 100.

With the approach of spring the mining outlook for the Yellville region is unusually promising.

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First New Report Available to Mining Interests Since One Made by State in 1900

In 1900 the State Geological Survey published a report on land and zinc deposits in counties of Northern Arkansas. Since that time, the World war provided an unprecedented demand for these metals. Prices soared and production reached an all-time high. Yet, not until 36 years from date of publication of the initial report has there been available to mining interests, geologists and other interested parties a new study of the fields. The deposits are considered among Arkansas's richest assets.

Through co-operation of the state and national geological surveys, a report on the lead and zinc deposits in North Arkansas has been prepared by Edwin T. McKnight of the staff of the National Geological Survey and is now ready for distribution.

The survey was proposed by Dr. George C. Branner, state geologist, and the state survey. The state shared in the expense of making the survey and publishing the findings in a book just received from the national organization. Workers from the state department assisted in making the actual survey.

252 Mines in Survey. A total of 252 mines in North Arkansas counties are included in the survey and are shown in a map which is made a part of the report. Another map shows the Yellville quadrangle, an area covering approximately 1,000 square miles, while a third shows formations in the Rush district. There overprints are provided for use with the maps.

Lead and zinc may be found in counties extending from the Oklahoma line east to the Coastal Plain in Lawrence, Boone, Newton, Searcy, Sharp and Lawrence counties, their report points out. Lead ore was found as early as 1818 and small production plants were built in the vicinity of Lead Hill in 1851 or 1852. Lead for manufacturing bullets was secured from these hills by Confederate forces during the Civil War.

Zinc mining began at a somewhat later date and reached its peak between 1914 and 1917, but since that time mining has been at a low ebb. The later history of lead mining in the region has closely paralleled that of zinc. The production from the region since 1907, according to statistics compiled by the United States Geological Survey, has been, in round numbers, 1,900 tons of lead sulphate concentrates, 11,500 tons of zinc sulphide concentrates, and 51,300 tons of zinc carbonate and silicate concentrates.

Geography. The deposits are north of the Boston mountains. They crop out chiefly along the Eureka Springs escarpment, which separates the Salem Plateau below from the Springfield Plateau above. Owing to the dissected nature of the Springfield Plateau, the escarpment is very sinuous. A considerable number of deposits are also found within the area included in the Salem Plateau. Vigorous dissection along the White river and its tributaries in northern Arkansas, especially in the more richly mineralized districts, has destroyed the plainlike character that is typical of both the Springfield and Salem Plateaus in parts of the Missouri Ozarks. The Springfield Plateau is narrow along the north base of the Boston mountains and in places is not developed at all. The White river and its tributaries are entrenched to depths of 300 to 400 feet below the Salem Plateau and 500 to 600 feet below the Springfield Plateau. Much of the entrenched drainage shows pronounced meanders that are characterized by asymmetric profiles on the bends.

Stratigraphy. The rocks of northern Arkansas are all sedimentary and range in age from Lower Ordovician to Pennsylvanian. The Devonian is not represented in the more richly mineralized districts, and the Silurian formations are thin and discontinuous. The Ordovician and Carboniferous systems, however, are well represented. The stratigraphic column in the Yellville quadrangle includes a maximum of 2,400 feet of rocks, divided into 19 formations. There are 12 well-established unconformities within the stratigraphic section and two additional ones that are questionable. The occurrence of so many unconformities has produced numerous discontinuities in the distribution of the formations. In general, the stratigraphic breaks recorded in the unconformities increase in amount from south to north, indicating that the axis of the uplifts was north of the lead-zinc region. The uplifts probably began some time in the late Cambrian and were recurrent throughout the rest of the Paleozoic and into post-Paleozoic time.

The richer ore deposits occur either in the Everton formation, of the Lower Ordovician, or in the

ing and Resurrection.
Wrapped in blankets, warm
lie
And listen the moaning wind
That creaks e icy limbs nee
And feel a kship with the
earth.
Whose heart ke mine is w
Just waiting spring for its
I know that a some late day,
My life shall blossom forth
Like to the leaves and flowers
May.
ANNIE KENDAL WILSON
Dredged From the Old Diary.
an AMERICAN, a real one, proud o

Zinc Mining Firm Completing Ore Mill

St. Joe—Activities in the Rush zinc mining district, northeast of here, include the rushing to completion of the mill building and the installation of new machinery at the Monte Carlo mine. The main structure will be completed this week with the laying of the corrugated steel roof. Separate foundations for the heavy machinery are completed and all the machinery is on the ground except the Deisel engine which is being shipped from Milwaukee. It is expected the mill will be ready to grip ore by November 1.

Boone formation, of the Mississippian. The Everton is 400 feet in maximum thickness and is composed of limestone, dolomite and sandstone. The Boone formation is about 350 feet thick and is made up of some stone and chert. Other mineralized strata are the Cotter dolomite and a certain bed, about 10 feet above its base. In Sharp and Lawrence counties the ore occurs in the Smithville formation, approximately the same position in the geologic column as the Everton farther west but which is believed by Ulrich to be older than the Everton.

Structure. The rocks of the lead-zinc region appear to be horizontal, but when studied over wide areas they show a low regional dip to the south, more marked in the Ordovician beds than in the Carboniferous beds. Local faulting and gentle folding have occurred. The faults are normal and fall into two systems, one northeasterly and the other east-southeasterly. Many of the faults are grouped to form graben blocks. They are post-Pennsylvanian except one that is post-Ordovician and pre-Mississippian. Certain of the folds (low domes, shallow basins, and monoclines) had their inception in the Ordovician period and have been accentuated at least three times.

Ore Deposits. A few of the ore deposits occur on faults where the Boone limestone forms one or both walls but most of them are runs and blanket veins. These are limited to certain beds; the mineralization followed zones of shattering, produced by very slight structural deformation of the rocks. The runs are simply the more richly mineralized portions of blanket veins, formed along the main channels of circulating ore solutions. The vicinity of faults was especially favorable for the development of runs. In the Everton formation ore is limited to dolomite beds or else to limestones that were silicified early in the period of mineralization. In the Boone, on the other hand, the ore may occur in unaltered limestone. The ore has in part filled pre-existing open spaces and in part replaced the shattered rock. Which one of these modes of occurrence prevails in a given deposit depends upon the character of the country rock and especially upon its texture.

The primary ore minerals are sphalerite and galena. The sphalerite is widely distributed over the region; the galena is restricted to certain districts, being conspicuously absent from those districts in Southern Marion county and Searcy county that have produced most of the zinc. The sphalerite is comparatively pure, containing only small amounts of iron and cadmium. The galena is very low in silver. Small amounts of chalcocite and pyrite are widely distributed, and a few small crystals of enargite have been identified at one mine. The gangue minerals are jasperoid chert (which has replaced the country rock), pink spar dolomite quartz, and calcite. The primary minerals show a paragenetic order of crystallization. Aside from variations in lead content, the mineralizing solutions appear to have been very similar throughout the region, and the differences that appear in the ore deposits result chiefly from differences in the character and texture of the country rock. The ore solutions are believed to have been, in part at least, of magmatic origin.

The lead ore marketed from northern Arkansas has been chiefly sulphide, but most of the zinc ore has been oxidized. The zinc carbonate (smithsonite) is notable for the variety of forms in which it occurs. The zinc silicate (calamine) is especially characteristic of the district around Zinc. Oxidation of the zinc has occurred essentially in place, without enrichment. Incomplete oxidation, resulting in mixtures of sulphide and carbonate or silicate, presents commercial difficulties of separation that are not surmounted in the methods of milling that have been used in the region. Aside from this tendency for some sulphide to occur with it, the oxidized ore is uncommonly free from objectionable impurities.

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Mining Revival At Rush

By TOM SHIRAS.

Rush, Oct. 17.—With the Urshel Zinc and Lead Mining Company's new mill in operation at the Lonnie Boy mine, the new plant at the Monte Christo mine nearing completion, and a number of other properties producing, Rush, during the World war the largest zinc mining camp in the state, is taking on new life. For the first time in many years ore shipments are regular again, and indications are that the production will gradually increase.

The big production during the World war was made on a high price and unnatural conditions. The production today is being made on a low price, building up from a much sounder foundation.

The Urshel Zinc and Lead Mining Company, which came into the north Arkansas field about two years ago is working two properties, the old Brewer lead mine in the Ponca City district in Newton county, and the Lonnie Boy zinc mine here. The properties are under the management of H. Urshel, an Eastern man, who is also operating the Silver Hollow, one of the oldest mines in the

district, milling the ore at the Lonnie Boy plant.

The Lonnie Boy has been developed from a prospect into a mine by this concern. The first work done on the property was a tunnel running into the mountain, about 15 feet above Buffalo river. During flood stage water ran into it. To overcome this situation, the operator put a bulkhead in the opening and went up into the mountain side and sank a shaft 65 feet deep into the ore. They are working the mine by a series of drifts running out from the bottom of this shaft. The upper run of ore consists of carbonate of zinc, the lower stratas being jack, or sulphide ore. They are producing the latter, which is a very high grade sulphide and brings the best price. Their mill turns out from four to 10 tons a shift.

The mill recently completed is a 75-ton mill located directly across the Buffalo river, from the mine, the ore being moved from the mine to the mill by an overhead tramway.

Besides milling their own ore from the Lonnie Boy, and the ore mined by Urshel at the Silver Hollow mine, they also do custom milling for Roscoe Hicks, who is working the old Mackintosh mine, and for any others who have mill dirt to mill.

Up until a short time ago, when Mr. Hicks got a lease on the Mackintosh, the mine had never made a profitable output. It joined the Ben Carney, a very rich mine, and everyone thought that the ore from the latter, could be picked up on the Mackintosh. Several tried to find the vein and failed. Mr. Hicks found it, and is making a good produc-

tion of both free ore and concentrates.

As soon as the mill or concentrating plant is completed on the Monte Christo mine, the production of the camp should take a big jump. This property was operated by J. C. Shepherd during the war and had a big production. With a splendid new mill on the property and plenty of ore in sight to work on, a good production is assured. The company now operating the mine is composed of Milwaukee men. Henry Hand of Yellville, is general manager.

The Edith mine, a big producer during the war, is back in operation, being under lease to Case Brothers, who have a small crew of men taking out ore. The free ore is being stacked up for shipment and the mill dirt is being milled at the Lonnie Boy mill.

Dodd City Activity Booms.

While this immediate camp has more mines in operation at this time than any other section of the field, the Dodd City camp, in the north part of Marion county, is showing some signs of activity. Lead is the attraction in that sec-

tion. Considerable prospecting is being done, and one property is being worked. Herb Rorie of Springfield, Mo., and associates are making good production at the Pigeon Roost mine. They have out about a carload of fine, free lead ore and will make a shipment soon. Some prospecting work is also being pushed around Short mountain.

In the zinc camp, around Zinc, in Boone county, Lon Brown and associates are doing some prospecting for silicate. Silicate of zinc is a sister ore to carbonate of zinc, carrying about the same metallic content, and bringing the same price on the market.

Mill at Zinc Mine in Marion County Burns

Yellville—The 75-ton capacity mill at the Lonnie-Boy zinc mine, in the

Rush mining district, burned Sunday at about 5 a. m. Cause of the fire was undetermined.

The night crew came off duty at 2 a. m., and the flames were discovered at 5.

The mill was owned and operated by the Erschel Mining Company, which has other properties at Silver Hollow and LaRue in the Rush district.

The Lonnie-Boy mill was new and had been operated for only about 10 months. Mr. Erschel, proprietor of the mill, was in Harrison at the time of the fire. Several men are out of employment as a result of the fire.

\$20,000 Loss As Zinc Ore Mill Burns

Gazette

11-18-36

Special to the Gazette. Yellville, Nov. 17.—The new zinc ore mill recently completed and put in operation by H. C. Erschel and associates at the Lonnie Boy mine burned Sunday. The fire was of unknown origin.

Loss is estimated at \$20,000 with no insurance.

Zinc Mines Active As

Price Goes Up

Gazette 11-21-36

Special to the Gazette.

Yellville, Nov. 20.—The price of zinc spelter is higher than it has been in 18 years, the market quotation being \$5.05 per 100 pounds. This condition is stimulating the local mining industry. Zinc producing properties are the scene of mining activity again, while the increased demand for leases on free ore mines is noticeable. Mines of this district operate profitably under the present price of ore.

Zinc Industry Hit By Burning of Mill

St. Joe—A severe blow and temporary setback to the zinc mining industry of this section was the burning of the Urshel mill of the Lonnie Boy mine, in the Rush neighborhood, 15 miles east of here, last week. Several mines had begun operations in the Rush field during the past few months and the Urshel mill was being employed to reduce their ore. About 50 men employed at the mill have been thrown out of work, and also work in mines will slow down until the mill can be restored, which will require several months.

Mining Makes Gain in North Part of State

Democrat 3-24-37
M. & A. Railroad Backing Boom in Zinc, Lead and Iron.

By WILL RICE.

St. Joe—A program of mineral development which will provide employment for many men and much freight tonnage to the railroad is being promoted, and in some cases financed, by the Missouri & Arkansas railroad, according to Vice President L. A. Watkins.

Zinc, lead and iron sulphide are the minerals involved, with an interesting story involving the latter. The development of marble quarrying also promises increased employment and freight tonnage.

Early this year the Manda Industrial Corporation was formed to buy ore and encourage mining. The "Manda" being "Missouri and Arkansas" in another form. Ore chutes have been built on the railroad sidings at Marshall, Gilbert, St. Joe, Pindall and Harrison. Ore is being bought at these points one day each week.

Since the commencement of the buying a carload of zinc carbonate has been shipped to Fort Smith, one is ready for Joplin, Mo., and 50 men are employed daily with pick and shovel getting the ore out. Mr. Watkins states that where those who are mining the ore have not the means of getting it to the shipping point his company has arranged for transportation.

The price paid for zinc is about twice what it was a year ago, and lead is back almost to wartime prices. Asked if these miners are working over old diggings, Mr. Watkins stated that was not a fact. Most of the ore is from new diggings. The Old Confederate mine on Cave creek, in eastern Newton county, is being worked on new leads.

A recent development is the building of a mill on the J. S. Johnson farm, three and one-half miles south of Harrison, by the Bennett & Clark Company of Denver, Colo. Here a good vein of free ore, carbonate and mixed ore has been uncovered.

The new market is for iron sulphide ore, familiarly known as pyrites of iron. There are large deposits northwest of Leslie in Searcy county, and north and west of Berryville, in Carroll county. For many years this ore was regarded as of little value, although an analysis shows 40 per cent sulphur. Now it is used extensively in the manufacture of certain acids and has a definite commercial value.

One of the largest steel mills in the South is investigating the manganese field north of Marshall and it is expected that it may acquire properties there and begin operations soon.

There is promise now that the working of the black marble deposits near Leslie may be greatly extended. The manager of the largest marble company in the South has expressed to Mr. Watkins interest especially in the spotted black marble of that section. This company has plants at Atlanta, Birmingham, New Orleans, Memphis and Columbus, Miss., and would have the Leslie marble handled at all these points. The largest former source of supply of black marble was Belgium. Marble workers say the Leslie marble takes as fine a polish as the Belgian marble, and of course would be obtained much cheaper.

A real accomplishment, in the opinion of Mr. Watkins, is that the buyers have been induced to buy red oak ties from this section. For some years only white oak and the more enduring woods had been shipped from here for railroad ties, and red oak timber was of little value to the owner. Between 150 and 300 carloads of red oak ties will be shipped over the M. & A. railroad this year. These go to creating plants in other states. It is hoped to procure the location of such a plant on the railroad in Arkansas in the near future.

Vice President Watkins states that there has been a 30 per cent increase in volume of freight handled this year over the same period last year. However, he explains that does not mean that much more profit to the railroad, as it would have to handle 24 per cent more business than last year to make the same profit, due to a steady lowering of rates, which have tended steadily downward for the past 10 years. He states the railroad is spending time and money to develop other industries to be announced later.

MINERAL BOOM IN M. AND A. RAILROAD TERRITORY BEGUN

Gazette 3-21-37

Special to the Gazette.

Harrison, March 20.—The 1937 industrial development program launched by Louie Watkins, manager of the M. & A. railroad, is beginning to show results. John Dirst, ore buyer for the road, who had a few idle weeks when he was first employed, is now kept busy sampling ore bins. Zinc and lead ore is being shipped from St. Joe and Harrison in carload lots. One new concentrating plant is in course of construction near Harrison, and another one will be built this spring.

In the general offices of the M. & A. here there is a steady stream of questioning: "How much can we get for carbonate, Mr. Watkins? How much for lead? How much for jack?"

About 100 men have started into the zinc and lead mining game during the last few weeks. Lead hit \$87.50 last week and zinc is up around the \$50 mark. There is an air of expectancy in all the lead and zinc bearing counties along the road, and each week as the price of these metals climb, more men start out with mining equipment to battle mother earth for her treasure.

Arms Race Resembles. Conditions in the field today are much the same as they were a few months before the World war broke out. No doubt but what the armament race in Europe is sending the price of these metals up. No one wants to see another war, but if European countries insist on fighting, north Arkansas mining men expect to reap a profit from it.

Lead seems to have become unusually scarce the last few months, and authorities are inclined to believe that the price of lead will remain high for some time. Even if the price of lead is profitable to mine, one has a deposit of any consequence.

North Arkansas is a poor man's mining field. Anyone who can coax a lease out of a land owner, equip himself with a small grubstake, a pick, shovel, wheelbarrow, drill steel and striking hammer, all of which can be purchased for a few dollars, can throw his hat in the ring. How long the hat stays there depends entirely on whether the prospect he starts on develops pay ore before his grubstake is exhausted. The old saying "that one man can see into the ground as far as another," holds pretty good in the field. Some win, some lose. Some win small bets, some win large bets, and lose in the same proportion. Those who know something about mining and about the ore-bearing faults in north Arkansas have an edge over the tenderfoot. But sometimes the tenderfoot has all the luck.

The north Arkansas zinc and lead field has a larger area of ore bearing formations than any other zinc and lead field in the United States. It takes in Boone, Baxter, Marion, Newton, Searcy, Carroll, Sharp and Lawrence counties, with some of these ores showing in Stone, Independence and other counties. One of the first zinc smelters in the United States, was located at Calamine in Sharp county, late in the 1850's, Marian, Boone, Searcy and Newton counties have been the heaviest producers of these ores, with Marion heading the list.

Three Zinc Ores. Three kinds of zinc ore are mined in north Arkansas: sulphide (jack), silicate of zinc, and carbonate of zinc. The sulphide ore is the primary ore and runs approximately 60 per cent metallic zinc. The carbonate is a secondary ore found in the limestone formations, and the silicate ore is a secondary ore found in and around deposits of silica. The two latter ores run approximately 40 per cent metallic zinc. The carbonate ores produce the highest grade slab zinc that can be produced from virgin ores. During the World war this ore was in strong demand as it filled government specifications for slab zinc after it was smelted, without further treatment.

The carbonate and silicate ores are found frequently in free deposits. That is, the ore is not disseminated in the rock formation surrounding it, and is ready for market as it comes from the ground. This is the kind of ore that gives a poor man a chance. He can sell it as it comes from the ground if there is an ore buyer at hand. If there isn't, he usually is sunk, because most small miners haven't enough money to finance the mining of a carload of ore. Louie Watkins has supplied this local market, and that is the reason the small miner along the M. & A. railroad can carry on today.

Disseminated ore is that ore scattered through the rock formations in which it occurs. Most of the sulphide ore in north Arkansas occurs in this form, and lots of the carbonate and silicate. Ore of this nature has to be milled and concentrated before it is ready for the mar-

ket. To open up and equip a mine of this character takes a lot of money.

All of the best zinc mines have first been discovered and opened up by the small miner. The Morning Star mine on Rush creek was discovered by John Wolfer and associates in the early nineties. Wolfer died about 25 years ago, and before he died he gave the writer a history of the prospect. They had no money and worked it on a diet of catfish, which they caught in Buffalo river, and venison which they killed in the surrounding hills. They got so hungry that they finally traded it for all the cove oysters and soda crackers they could eat. Capt. George Chase of Fayetteville finally got hold of the property and operated it for many years.

Lead Ores Concentrated. Lead ore is not as widely distributed in north Arkansas as zinc. Most of the lead prospects are in the north parts of Baxter, Marion and Boone, and in Searcy and Newton counties. This ore also is found in both free and disseminated forms. The free ore is ready for market as it comes from the ground. The disseminated ore has to be milled. Most of the lead produced in this section has been free ore. At the price today a full wheelbarrow load of free ore is worth a little more than \$20.

There is an element of luck in zinc mining. William McCaffery, who lives near Bruno, adjacent to the M. & A. railroad, has been selling approximately \$40 worth of ore a week now for several weeks, and may develop a mine worth

thousands. He bought a small place a year ago, the drouth got his crop and he was up against it. There was a cave on his land that he thought might be developed into something worthwhile as a sightseeing wonder for tourists. One day he and his boy explored it. They found a rich vein of jack in one wall and forgot the cave as a sightseeing proposition. Since then they have made weekly turn-ins of ore and are now on the way up.

The Urshel Mining Company is probably the largest producer in the field at this time, mining lead near Ponca City in Newton county, and zinc in the Rush creek district. They had things going nicely in the latter camp last year, but lost their concentrating plant by fire. They will rebuild this spring. At the present time they are producing lead at their Newton county mine, and Mr. Watkins told the writer recently that they had a big shipment ready to go out.

Many Outsiders Attracted. The field is attracting miners from other ore producing states. Bennett, Bennett and Parker of Denver Col., have a mill under construction on the Johnson land on Crooked creek, near Harrison. They recently uncovered a good deposit of carbonate at that place and are shipping this ore. The mine shows a good run of jack at a lower level and they will develop this run.

Roscoe Hicks and others in the Rush creek camp are mining free carbonate ore, and free lead is being mined in the Dodd City district north of Yellville.

Miners in the Cave creek district, south of St. Joe, in Searcy county, are producing in carload lots. The new mill at the Monte Christo mine in the Rush creek camp is about completed and will probably start producing ore this spring.

Reduction Plant Needed. One of the adjuncts necessary to a permanent mining field in north Arkansas is the installation of a smelter or electrolytic reduction plant, which would open up a local market for the ore. A regular smelting plant seems out of the question for the district because of lack of fuel, but the electrolytic plant seems feasible. The early promised development of water power on White river would take care of the increased demands for current as the industry developed.

Louie Watkins, sees the necessity of such a plant in the field and in a recent interview stated that he was going to take the matter up with the Arkansas Power and Light Company, and see if some plan couldn't be worked out for the establishment of such a plant.

Lead and Zinc Mines Democrat 4-4-37 Open as Prices Rise

Mountain Home—There is considerable activity in the mining section of this and Marion counties. The high price of lead and zinc has caused many of the old mines that were operated during the World war to be reopened.

The Rush Creek field in Marion county was the largest in war days and is now leading other fields in operation. Most of the ore being brought at this time is free ore and can be shipped without milling. No large mills have started yet and most of the work at present is on a small scale. If prices continue good some of the large mines may be opened soon.

Thousands of dollars worth of ore was taken out and shipped from this section during the World war. With a better system of highways now it will be much easier to get the ore to shipping points.

Makers continue to work late into the night designing finery in keeping with the pomp and pageantry of coronation day.

Such elegance is outstanding in the spring collection of Helen Chandler. Her evening gowns are elaborate and her afternoon frocks extremely interesting. Even her daytime costumes, with their bright colors and clever trimming touches, have a party look.

Zinc, April 10.—Zinc mining operations in this section of Boone and Marion counties, suspended about 20 years ago when the bottom dropped out of the price of ore, are starting again in a small way. If the price of ore stays up for the next six months, this camp will be booming again, for the price is high enough now for the average free silicate mine to show a profit.

During 1914, 1915, 1916 and 1917 this camp had a big production of silicate of zinc ore, and the industry had just hit its best stride when the price blew up. Most of the ore mined at this place is free silicate of zinc, which is ready for market when it comes from the ground. Operations on this kind of ore can be started with small capital. Mills at Alma, Madison, Coker Hollow and Jack Pot, which operated on disseminated ore during the boom days all have been dismantled and the machinery sold. New plants will have to be built outright if milling operations are resumed again. Free ore however, is the big attraction, and the industry will start on a free ore basis.

Brown and Wingate have taken a lease on the Jack Pot property and are preparing to start mining. Lon Brown of this firm was once the largest producer in the camp, and besides his own production, bought and handled most of the ore produced in the camp.

In a recent interview, George Kirkwood of Lead Hill, who represents the Almy heirs, said he is negotiating a lease for 40 acres of the property with Huddleston Bros. of Yellville. They will start mining operations as soon as the deal is closed.

Louie Cantrell of Green Forest, who, with his brothers, operated the Coon Hollow property during the high price of ore, was at Zinc this week looking over the old ground with a view of starting work again.

Lead Miners Active.

In the Dodd City district in Marion county, a few miles northeast of here, three properties are operating. Miners on the Young land are making a good production of free lead at the Pigeon Roost mine. Across the mountain at the old Pilot Rock, on which John Dirst recently took a lease, a force of miners has started several shafts and open cuts on lead and free carbonate of zinc prospects. Mr. Dirst has a lease on the old Governor Eagle, and is starting production of free ore there. All of the lead being produced in the Dodd City district is free lead. There is a deep run of disseminated lead at the old Nakomis property. It was struck at the 174 foot level in the shaft and is about six feet thick. If this run of lead could be proven by drilling, to extend over enough territory, it would make a permanent lead camp.

Some prospecting for lead is in progress in the Lead Hill sector, in North Boone county, but no production has been developed.

Lead Hill gained its name from lead mining in the vicinity of the town, directly after the Civil war. Two smelters were located at that place, and many smelted lead bars were shipped from there. Much deal of the ore was mined on Coffee Hill, three miles from the town. This hill got its name from the fact, that whenever one of the neighborhood housewives ran out of coffee, she would send the kids up on coffee hill to dig enough lead to buy coffee with.

Prospecting no doubt will show that there is plenty of free lead still there to buy a good many sacks of coffee.

Arkansas Smelting Co. to Open Plant at Van Buren.

Gazette 4-8-37
Van Buren, Ark., April 7 (AP).—B. H. Jacob, Joplin, Mo., president of the newly organized Arkansas Smelting Company, announced here today a local smelter will be put into operation between May 1 and 15.

Jacob is also an official of the Eagle-Picher Mine & Smelting Co., which acquired the local plant from the American Mine and Smelting Company. The company will engage in smelting and processing zinc and other ores. Approximately 100 workmen will be employed when the plant is opened, Jacob said.

Zinc And Lead Mines Increasing

Gazette 2-5-2-37

Yellville, May 2.—The zinc and lead mining industry in the North Arkansas field, which started several months ago when the price of these ores came up, is still attracting new operators. During the last 10 days a number of new properties have started operations.

Roy Darden and Ben Wingate have taken a lease on the Onwata Mine, in the north part of Marion county, and have started the production of free ore.

The Urshel Mining Company, operating a lead mine near Compton, in Newton county, recently shot into a cave that was rich in lead ore values, and is making a nice production on this strike.

B. Bateman, who is operating the old Confederate mine near the head of Cave creek, in Newton county, shipped his second car of ore last week. It is a mixed lead and zinc ore and is purchased for its chemical qualities.

Joe Burleson has leased a tract of lead land from Elmo Sloan, in the north part of Marion county, near Monarch, and has started prospecting.

A small concentrating plant has been

completed and put into operation on the Sylvia Johnson property near Harrison by J. T. Parker, E. R. Bennett, G. B. Williams and E. L. Newman, who leased the land late in the winter. They are working a face of free carbonate and jack about three feet high and 12 feet wide. The free ore is sold as it comes from the ground and the disseminated ore is run through a crusher and a set of rolls. From the rolls it goes to two hand jigs where the ore is removed from the gangue matter and is ready for market.

Small Miner Making Money Stripping Ore

Democrat 4-28-37

Even Inexperienced Farmers Benefit From Demand for Zinc.

Yellville—Several carloads of zinc ore have been shipped from the Ozark district lately by local buyers. Miners here and some farmers who had not mined before, have made this production of new wealth from newly opened prospects and extensions of developments in former mine workings.

The capital of the home miner consists mainly of courage and willingness to stay on the job and do real work. His equipment consists of picks, shovels, some hand steel and a little dynamite.

What ore these pick-and-shovel miners get out that they can sell readily in lots of 100 pounds or up to a few tons, is locally known as "free ore." That means it is not mixed with rock so as to require treatment by milling, but is ready for market as it comes from the ground. However, where the free ore is found in volume to justify that class of mining, a larger volume of milling ore also is found.

The free ore miner who usually has a lease on a small area of proven mineral ground, stacks his milling ore on the mine dump to be treated later when developments will attract the building of a mill on the particular property or in the immediate camp. When such facilities materialize the owner of the milling ore will deliver it to the plant for treatment on a custom basis, the same as farmers deliver cotton to the gin.

Miners' League Gives Help.
With co-operation of J. H. Hand of Yellville, who is manager of the Ozark Mine Owners' League, many small leases are being located upon properties that are represented through that organization, and the owners of which live in other states. What are known as "strip leases" are given to local miners on terms whereby they may not only get immediate benefits from free ore

which they mine, but also stand a good chance to cash in later on their milling ore, and from valuable developments resulting from these individual lease operations.

As examples of how this plan works out, there are five strip leases, side by side, on one property near Yellville being worked by as many separate crews. These are mostly farmers, some of whom have had slight experience in mining work for wages in the past. In one case a farmer working on spare time during the past two months has sold more than \$50 worth of free ore at Yellville, while taking out perhaps three times that amount of value in the form of milling ore.

Another farmer and his son, on an adjoining strip lease, have produced and sold about \$100 worth of free ore, working spare time, while every other working that started later on that string of strip leases has tapped the ore deposits, and is promising of early returns on free ore.

Another example: Three experienced miners working two days to try out a prospect before taking a lease, cleared \$40 in free ore alone, besides taking down a large quantity of 25 per cent milling ore, while uncovering extension of a rich deposit.

Deposits Undeveloped.
Thus, the little miner is not only developing a profitable pursuit for himself, but is also helping to verify the prediction of the late Dr. John C. Branner, former state geologist, that the "hundredth part of the ore deposits in the Ozark zinc district have not been touched," for these plodding miners are making new discoveries almost every day.

With co-operation of the Mine Owners' League, certain outside interests are working on two important factors that will, when materialized, put the Ozark field far up in the ranks of the zinc producing industry.

First, to establish independent concentrating mills to serve local mining industry on a custom basis.

Second, to establish electrolytic zinc works in the district where adequate hydro-electric power is available.

These factors will open the door to opportunity to the small miner who cannot provide his own mill, and will afford a top market to ore producers at a saving of freight charges to foreign smelters.

MINING NOTES

By J. H. HAND,
Mgr. Mine Owners League

Mountain Echo
Yellville

5-5-37

According to recent statistics by the American Bureau of Metals, the consumption of zinc in the United States for 1936 was 585,000 tons, as compared with 473,000 tons for 1935, and 370,000 for the year 1931. The amounts of zinc used in the various industries last year are reported respectively as follows: In galvanizing, 242,000 tons; brass making, 168,000; rolled zinc, 55,000; die casting, 72,000, and 40,000 tons in other uses. With an increase of 215,000 tons over 1931, and 112,000 over 1935 in zinc consumption by American industries, the vital importance of zinc mining in relation to general industry is apparent, and accounts for prices of zinc ore having doubled within the past two years.

Zinc sulphide or jack of 60 per cent grade was steady at \$45 a ton on last Saturday's market, the same as a week before. On that basis the price of 40 per cent carbonate should normally be \$30 in car lots for contract deliveries, but that price cannot be expected on stray or occasional shipments of carbonate.

Growing number of applications from local miners for workable small leases that are promising of free ore production show that our people are becoming more mining minded and more conscious of the possibilities for the little operator to win rewards from digging into pay ore deposits that respond to the touch of the pick near the surface of these hills. During the past week several new leases have been taken and work on them started, with results that are gratifying to the operators.

Three leases, known as strip leases, consisting of narrow strips of ground laid off on proven ore deposits, were closed and work started on them last week upon one property in Rush district. The Home Mines Company, recently formed by Yellville people, started sinking a shaft to tap a rich ore body exposed in a tunnel that had become unsafe to work in. The ore was reached at a few feet below the surface and off to one side of the underground works in which a rich face some 12 feet thick appears. Around a ton of extra high grade free ore was taken out during the preliminary work, including the sinking of the shaft mentioned. At another lease on the same property, worked by two men only five days, around a ton of free ore was stacked out on their dump while they were squaring up their diggings in shape for mining. With only one day by one man on a third lease, around 150 pounds of free ore was sorted out. In addition to free ore yields which are promising to be in the pay class, each of the works just mentioned carry very rich deposits of milling ore which represent perhaps 80 per cent of the mine values, and that is true at practically every prospect in the district where free ore is found. Hence, development extensions, and output of milling or incidental to free ore mining in the manner that is being done at many places, will soon warrant the building of mills at suitable locations whereby these small operators may get the milling ore coming from their leases treated on a custom basis, the same as the farmer gets his cotton ginned; thereby be enabled to realize

much larger returns from their workings. Here it might be stated that consideration is now being given to the proposition of establishing custom mills at certain centers within reach of several small mining groups where development extensions reveal good milling ground. Thus the mine operator would be relieved of the burden of providing his own mill, while the mill operator would not have to invest in the mine in order to supply his mill.

When the roads settle and creeks run down from recent rains a large tonnage of free ore doubtless will be assembled from a number of workings in the district for shipment by local buyers.

Hopeful Outlook On Ozark Mine

The growing increase of zinc consumption is significant of increased uses of zinc. Consumption or uses of zinc in 1936 were almost twice that in 1931. In 1931, business was going pretty strong, before the depression had knocked the props out. In 1936, business recovery merely got started. If something does not happen to cause a slump, 1937 and years to follow will show progressive advancement in business pick-up. That will mean further increase of requirements for zinc, as well as other basis metals.

According to reliable reports, the supply of zinc is slight, that is, what is mined and above ground represents only about one month's requirements. That is a very slim margin. A brisk pick-up might consume that reserve very quickly, along with current production.

Normal zinc production in the United States has fallen off as a result of mine depletion in the older districts. For instance, the Joplin or tri-state field which has for 50 years been the chief center of zinc production, is falling off. Of the 69 mills now reported in operation there 29 of them are what are known as sludge mills, reworking old tailing piles. Of the 40 other mills, some of them are treating ore brought many miles from mines that could not alone afford a mill.

The Ozark field is the only virgin zinc district left in the country, so far as known to the mining profession, and the industry will have to come here sooner or later. Now is the golden opportunity for home people to take hold and get lined up for a smile from "Lady Luck" when the gong does sound for the big play that is sure to come along later. If we wait for outsiders to open the way, the profits will go with them to their homes in other states and help to enrich other communities. If home people take the lead, the wealth will remain at home.

YELLVILLE-SUMMIT F.F.A. NEWS

Everything is ready for the trip to Fayetteville to attend the "Special Visiting Day" program May 8th for all vocational agriculture students. Yellville and Flippin are going together for this trip, and use the Evans school bus. At present 20 individuals plan to go from Yellville and 15 from Flippin. There is room for 5 or 6 more individuals yet on

New Zinc Property Opens at Yellville

Yellville—Operation of a new mine on the Big Hurricane zinc mining property has begun under direction of a company formed by Ralph Huddleston of Yellville, president. A shaft is being sunk to tap a deposit of zinc sulphide, located through drilling.

The company is incorporated with an authorized capital of \$100,000. In addition to Ralph Huddleston, officers are: Harold R. Parker, Little Rock insurance man, vice president, and C. M. Huddleston, Yellville, secretary-treasurer. Ralph Huddleston was in charge of operation on the Big Hurricane property when the J. S. Shepherd Mining Company was in operation.

Couple Planning to Develop Rich North

Arkansas Lead Mines

Democrat 6-22-37
Fayetteville—Arkansas is to have a woman miner, Lucy Critz Trent of Fayetteville is planning to re-open the old lead surface mines of Yellville in Marion county, northwest Arkansas, that made this section famous for its minerals at the time of the St. Louis World's Fair in 1904 and again during the World War.

It was from these Arkansas mines that the St. Louis exposition's prize-winning lead nuggets were produced. It was from these mines that bullets were made from ore that brought the premium lead price of \$127 a ton.

Ore from these long abandoned mines has once more been pronounced "straight galena" of the highest quality, and war-like moves in many lands are sending up the price of lead.

Lead at Yellville is imbedded mostly in rose-quartz which is in itself at this time greatly in demand for use in costume jewelry.

Mrs. Trent and her husband, A. L. Trent of Fayetteville, are back from a prospecting trip to Marion county, bringing with them samples of the ores from their land and which they have sent to the University of Arkansas and to the University of Wisconsin for analysis.

Besides lead and rose-quartz, they found on their properties a large number of other minerals for which there now is a market. Among these are resin jack zinc, talc for cleaning and polishing metals, yellow marble, onyx, tripoli clay, used as a base for face powder, agate, and other by-products.

Mrs. Trent is sole owner of the most productive 158 acres of the ore-bearing lands from which almost pure lead and quartz may be taken. She has donated two of her 160 original acres for the site of a new school building and a right-of-way for a new highway, which will provide what the section long has lacked, an all-weather road to the mining area.

Following summer school at the University of Arkansas which she now is attending, Mrs. Trent plans to develop her properties.

She had had a recent cash offer for the acreage she is not considering at this time. She also has been approached to organize a company in which she would be allowed to retain the controlling interest.

"I have not decided exactly how we will proceed," she said today. "I know definitely that we will develop the mine, but just how is not yet determined, whether through lease, company organization or independent mining.

"I am anxious to reopen these famous old surface mines of 20 years ago and to show what Arkansas has in the way of mineral wealth."

New Company Organized To Mine Zinc in Marion County.

Special to the Gazette. 6-24-37

Yellville, June 23.—A new company has been organized on the Big Hurricane zinc mining property, with the following officers: Ralph Huddleston, Yellville, president; Harold R. Parker, Little Rock, vice president, and C. M. Huddleston, Yellville, secretary-treasurer. The company is incorporated with an authorized capital of \$100,000. President Huddleston will be in charge of operations at the mines. He was foreman there during former operations of the Big Hurricane by the J. S. Shepherd Mining Company when the mine produced and shipped \$342,000 worth of zinc concentrates. Mr. Parker is a Little Rock insurance man.

A shaft is being sunk to tap a deposit of zinc sulphide which has been demonstrated by drilling. Ore shipments heretofore have been mined from the upper run because of the low cost of producing carbonate ore occurring in large volume near the surface. Like practically every other zinc mine in the Ozark district, the Big Hurricane has two ore runs—carbonate of zinc on the upper level and sulphide on the lower run.

Keeping step with the pace set several weeks ago in local mine development, several workings have turned out new lots of free ore. Buyers are rounding out a two-car shipment this week. Miners sell their ore at the diggings as buyers come and grade the output and haul it to railroad shipping point.

Wonderful Mineral and Stone Resources

Mountain Home 6-25-37

There isn't a county in the White River Country but what has valuable mineral resources. The minerals are lead, zinc, iron, and manganese. The commercial stones are the marbles of numerous colors and textures, limestone, glass sand and phosphate rock. Mining and quarrying is in progress in nearly every county, but the industries are just in their infancy considering the vast amount of materials there is to work on.

Lead, zinc, and iron are found in Boone, Baxter, Marion, Searcy, Newton, Lawrance and Sharp counties. Manganese in Independence, Stone, Izard and Searcy counties. Phosphate rock, and glass sand are found in Izard and Independence counties. Marble and limestone are found in all of the counties.

Most of the lead and zinc ore that has been produced in North Arkansas has been produced in Marion, Boone, Newton, Searcy and Baxter counties. The first zinc smelted in the United States was mined and smelted near the little village of Calamine in Sharp county.

During the World War an immense tonnage of zinc ore was shipped from the North Arkansas field. After the war the price declined to a point where it could not be mined profitably and operations were practically suspended for a number of years. The higher price for ore which started about the first of this year started operations again and all parts of the North Arkansas field are active again.

Five counties in North Arkansas are producing ore this year and the industry has gained steadily since the first of the year. Zinc ore and some lead are being mined in Boone, Baxter, Marion, Boone and Searcy counties, and if the price stays up operations will be increased. Most of the mining operations are on free ore, both lead and zinc. The free zinc ore that is being produced is silicate and carbonate and is ready for sale as it comes from the ground. All the lead ore that is being mined is free galena and is ready for market when taken out of the ground. This ore runs around 80 per cent pure lead. The silicates and carbonates of zinc run around 40 per cent. Both ores are in good demand at the smelters.

At this writing Rush, in Marion county, is the heaviest producer, there being more mining concentrated around this place than any other in the field. This was the heavy producing camp during the World War and if the price of ore stays up will gain back all of its lost ground, as there is plenty of ore in this camp. The Monte Christo Company recently completed a new concentrating plant at the Monte Christo mine in this camp and this mine promises to be a large producer.

The M. & A. Railroad with general offices at Harrison, Ark., has been one of the prime factors in getting mining industry started again. There was no local market for ore which was a great handicap for the small producer as he could not accumulate a carload before he had to sell. They employed John Dirst, a well known mining man to purchase ore along their railroad, and shipments have steadily increased since he started to work. He buys in small and large lots which gives the small operator as well as the large one an outlet for his ore, cash in hand.

The North Arkansas field is still a mecca for the small operator. If

you can find a free ore outcrop, can get a lease and have enough money to buy a pick and shovel, wheel barrow, striking hammer and powder, you can start to work. You may win and you may lose.

The carbonate and silicate zinc ores of the field not only make the best slab zinc that can be made out of crude ore, but are well adapted to chemical use as well. Some jack is mined and no doubt some time in the future the field will produce a big tonnage of this ore, but to date, the carbonate and silicates constitute the heavy production of the field.

Manganese ore, which is a member of the iron family is found in Independence, Izard, Stone and Searcy counties. The heaviest production is made in the Batesville-Cushman field, of which Cushman, in Independence county, is the center. Manganese is used in the manufacture of steel, giving it its tensile strength.

The present European war scare has put new life into this industry and operations are heavier now than they have been since the World War.

There are two distinct varieties of manganese ore: oxide ore and carbonate ore. The carbonate ore is the primary ore of the field, being laid down in blanket veins that are continuous through the hills in which they occur. This ore has the appearance of St. Clair limestone in the vein and when first mined and for over half a century was thrown into the waste pile. Several years ago its value was discovered and shipments of this ore have been regular since that time.

The oxide ores in the field occur for the most part in pockets in the clay. Some of these pockets are extensive in area while others are not so large.

Some of the deposits occur in the form of boulder ore, chunks from the size of an egg to those weighing several hundred pounds. This class ore and the free carbonate ore is ready for market as it comes from the ground.

Other deposits are made of wash ore. This is mixed through the residual clay in fine pieces and has to be washed and concentrated before it is ready for the market. The washing and cleaning is done in regular washing plants, and the ore is saved with jigs and tables.

Ore from the Batesville-Cushman field commands the highest price at the furnaces, and shipments are regular. The field has produced more high grade ore during the last five years than any other manganese field in the United States and is capable of a tremendous production. The price of ore governs the production to a large extent. When the price is high, production goes up, when it is low, it declines.

While manganese is present in Searcy county, near Big Flat, these deposits have never been investigated thoroughly and none has been shipped from this section. From what the writer has seen of these ores they warrant thorough investigation, with a strong possibility of developing a producing camp in that section.

Walter H. Denison is the largest producer of manganese in the field or in Arkansas. He operates a number of properties and buys most of the ore produced in the district. He has been in the business for over half a century and might be classified as the father of the manganese mining industry in Arkansas.