

*Happenings
Of the
State Mineral Survey
Of
Arkansas*

ARKANSAS GEOLOGICAL COMMISSION
VARELLE PARHAM GEOLOGY CENTER
LITTLE ROCK, ARKANSAS 72204



Supervisors of various districts.

100 Persons Enroll in Mineral Survey School.

Approximately 100 persons were enrolled in a training school in the House chamber at the capitol yesterday for a 50-county mineral survey started several weeks ago. The survey is a WPA project.

Persons attending the school will compete in examinations prepared by the state Personnel Division at conclusion of the school next Tuesday for positions as supervisors.

Field work on the project will start next week. Headquarters for the survey have been set up in the Hoffman hotel, 115 North Victory street.

State Mineral Survey Limited To 50 Counties.

The WPA financed mineral survey project, began Thursday, which had been scheduled to be statewide in scope has been reduced to include the 50 leading mineral producing counties to come within the appropriation, State Geologist George C. Branner said yesterday.

Counties in which an inventory will be taken of minerals and water resources include tiers of counties in north and west Arkansas and those in eastern Arkansas situated on Crowley's Ridge.

Classwork to acquaint workers with the aims and procedure for the project will be started on the fourth floor of the capitol next week, R. C. Beckstrom, supervisor of the project, said.

Mr. Beckstrom appealed to residents of the counties included in the project to assist workers in the collections of materials and data.

"The whole purpose in this project," he said, "is to help residents of Arkansas to become acquainted with the resources in their vicinity so that they may make use of the building materials and other resources in their immediate vicinities without having to bring them in from distant points."

More than 60 workers will be employed in the project estimated to cost approximately \$100,000. The project has been set up for six months.

CAPITOL REPORTS HEADWAY IN SURVEY

Survey of State Minerals To Start Thursday.

If Arkansas is as fortunate as Oklahoma, the state will make a substantial savings in its annual road building material bill from a state-wide mineral survey to start Thursday, George C. Branner, state geologist, said yesterday.

Many new sources of road building materials were discovered in Oklahoma during the survey in that state, he said. In several instances the sources were located within a short distance of the highway projects under construction.

Workers employed in the survey will obtain data on road materials in each county, recording the location and extent of the deposits. Past and present uses of the materials will be set out together with suggestions for new uses for the materials. The various materials discovered in the survey will be forwarded to the state Highway Department laboratories for testing.

The survey of road and building materials is one of four divisions of the project to be financed with more than \$50,000 in WPA funds. Other divisions are a general mineral survey and inventory; survey of caves and other natural phenomena, and survey of underground water resources.

R. C. Beckstrom, director of the project, said a tentative plan of procedure had been set up whereby workers would receive a brief period of instructions into the purposes of the project. Experimental surveys then would be made in Pulaski, Lonoke, Saline, Grant and Hot Spring counties. All the approximately 60 workers to be employed in the project will be taken from certified WPA lists.

Districts Set Up for Survey Of Minerals

Gazette Jan 9, 1938

The 50 counties of the state which will be included in a WPA financed mineral survey have been divided into eight geological districts for purposes of the survey, R. C. Beckstrom, director of the project, reported yesterday.

The 50 counties will embrace 24,570 square miles or 46 per cent of the total area of the state. Because of limited finances the project has been restricted to the 50 counties which appear to offer the greatest possibilities for the discovery of little known or unknown deposits. Other counties of the state may be included in the project later, Mr. Beckstrom said.

Areas Defined.

The districts are as follows:

1. Wilcox area, 2,880 square miles in Pulaski, Saline, Grant, Hot Spring, Dallas, Ouachita, Clark Nevada Miller and Hempstead counties.
2. Cretaceous area, 1,328 miles in Hempstead, Clark, Nevada, Howard, Sevier and Little River counties.
3. Central Ozark area, 3,384 miles in Boone, Marion, Newton and Searcy counties.
4. Crowley's Ridge area, 1,214 miles in Clay, Greene, Craighead, Poinsett, Cross, St. Francis, Lee and Phillips counties.
5. Western Ozark area, 3,456 miles in Benton, Carroll, Washington, Madison, Crawford, Franklin and Johnson counties.
6. Coal district area, 2,448 miles in Sebastian, Franklin, Logan, Pope, Yell and Scott counties.
7. Ouachita area, 5,040 miles in Polk, Montgomery, Garland, Saline, Hot Spring, Clark, Pike, Howard, Sevier, Scott Yell Perry and Pulaski counties.
8. Eastern Ozark area, 4,320 miles in Fulton, Izard, Sharp, Independence and Stone counties.

Headquarters for the project will be set up this week in the Hoffman hotel, 115 North Victory street. Field work is expected to start within the next two weeks. More than 60 workers from certified WPA lists will be employed on the project six months.

Survey For Minerals To Begin Today

Gazette Mar. 1938

A state-wide mineral survey to be made by the Works Progress Administration through sponsorship by the Arkansas Geological Survey will be started in 31 counties today, Floyd Sharp, state WPA administrator, said yesterday.

Headquarters for the project, said to be one of the largest white collar projects ever undertaken by the WPA, will be at 117 Victory street. Robert C. Beckstrom will be supervisor. Purpose of the project is to "locate, measure, estimate, describe, test and map the accessible resources of the state, such as construction materials, minerals and water tables for use in determining their adaptability for economic use."

A total of 450 workers will be employed in the 31 counties. The work will be extended to include 55 counties later, Mr. Sharp said. Total employment in all counties will be 600 with approximately 15 workers to each county.

Supervisors for the counties were selected by Mr. Sharp with the co-operation of Kenneth O. Warner, state personnel director and Dr. George C. Branner, state geologist. A two-week school was conducted and persons with the highest grades were selected, Mr. Sharp said. Additional supervisors in the counties to be included later will be selected from applicants with a "preferred" classification.

County Supervisors.

Supervisors for the 31 counties are as follows:

- Robert C. Waggner, Boone.
- Dana M. Greer, Benton.
- E. E. Mitchell, Baxter.
- Robert W. Osborne, Clark.
- Charles S. Litte, Carroll.
- William M. Tucker, Dallas.
- Tom D. Rogers, Franklin.
- James K. Riffel, Garland.
- Robert E. Cargile, Howard.
- Rex E. Moon and Louis M. Hannum, Hot Spring.
- Cecil Driver, Izard.
- William G. Rinehart, Independence.
- Edward Bowman, Lawrence.
- Ira W. Merritt, Lee.
- Richard F. Duncan, Montgomery.
- Claude M. Huddleston, Marion.
- James T. Smith, Madison.
- Donald S. Tedford, Newton.
- Arlington Waggner, Pike.
- Allen C. Pipkin, Polk.
- Eugene B. Badinelli, Phillips.
- Carl C. Burkett, Pulaski.
- Walter E. Glasgow, Perry.
- Lytella McIlroy, Randolph.
- Walter E. Womble Jr., Sebastian.
- Ralph Huddleston, Stone.
- John H. Tait, Saline.
- Samuel H. Cole, Sharp.
- Lewis C. Crutchfield, Scott.
- Lester Hall, Searcy.
- Roy Monroe Ward, Washington.

Survey Discovers Jaw of Mastodon

"Gazette" 5-24-38

Discovery of the jaw of a mastodon, extinct elephantlike animal, in Lee county was reported yesterday by R. C. Beckstrom, director of a state-wide WPA mineral survey. The discovery was made by field workers during a routine survey of Lee county. The jaw was brought to Little Rock and placed on display at state headquarters in the Hoffman hotel, 115 North Victory street.

The mastodon is described as differing from the mammoths and present-day elephants in the molar teeth. Abundant remains of the American mastodon including several nearly complete skeletons have been found.

State Mineral Survey Starts

Democrat Gazette Mar. 1, 1938

WPA Project, Employing 450 Workers, Embraces 31 Counties.

A state-wide mineral survey, employing 450 workers, was initiated in 31 counties today by the state Works Progress Administration under sponsorship of the Arkansas Geological Survey. Headquarters are at 117 Victory street, with Robt. C. Beckstrom as supervisor.

Work will be extended to embrace 55 counties to give employment to 600 workers with approximately 15 in each county as one of the largest white-collar projects yet undertaken in the state, state WPA Administrator Floyd Sharp announces. Purpose of the project is to "locate, measure, estimate, describe, test and map the accessible resources of the state for determining economic uses of construction materials, minerals and water tables."

Supervisors for the 31 counties, selected after a two-week school with co-operation by state Personnel Director Kenneth O. Warner and state Geologist Dr. George C. Branner are:

- Robert C. Waggner, Boone; Dana M. Greer, Benton; E. E. Mitchell, Baxter; Robert W. Osborne, Clark; Charles S. Litte, Carroll; William M. Tucker, Dallas; Tom D. Rogers, Franklin; James K. Riffel, Garland; Robert E. Cargile, Howard; Rex E. Moon and Louis M. Hannum, Hot Spring; Cecil Driver, Izard; William G. Rinehart, Independence; Edward Bowman, Lawrence; Ira W. Merritt, Lee; Richard F. Duncan, Montgomery; Claude M. Huddleston, Marion; James T. Smith, Madison; Donald S. Tedford, Newton; Arlington Waggner, Pike; Allen C. Pipkin, Polk; Eugene B. Badinelli, Phillips; Carl C. Burkett, Pulaski; Walter E. Glasgow, Perry; Lytella McIlroy, Randolph; Walter E. Womble Jr., Sebastian; Ralph Huddleston, Stone; John H. Tait, Saline; Samuel H. Cole, Sharp; Lewis C. Crutchfield, Scott; Lester Hall, Searcy; Roy Monroe Ward, Washington.

Survey Shows Big Mineral Deposit

Ark Gazette, 4-1-38

Special to the Gazette.

Batesville, April 30.—Recent investigations of phosphate beds along the Independence-Izard county line in the latter county disclose a potential tonnage of aluminum phosphate rock of approximately 5,000,000 tons. These phosphates are associated with the Cason Shale formation. They have not been utilized for fertilizer because they will not take acids.

George Weigart, who has been investigating these phosphate deposits during the last year, said that they have a high chemical value. Hundreds of pounds of samples are now in the hands of chemical engineers for analysis. They run from 25 to 30 per cent alumina and phosphate, and can be used for producing a highly concentrated phosphoric acid and other by-products. Sulfuric acid is used in the manufacture of fertilizer now. The highly concentrated phosphoric acid derived from the aluminum phosphate rock of Izard county can be used for the same purpose, with a higher availability.

Fertilizer produced with highly concentrated phosphoric acid has all the strength but much less bulk, which is a large factor when it comes to shipping, both as to bulk and rates. The only other place in the world where it is known that aluminum phosphate exists is in Minerva Grotto, in the south of France.

Mineral Study In North Arkansas

Gazette 3-20-38

Special to the Gazette.

Mountain Home, Ark., March 20.—One hundred and sixteen men, including the county directors, have started WPA mineral surveys in 16 North Arkansas counties, under the supervision of the State Geological Survey.

Every section of land in each county will be prospected, and it is expected that it will take from eight months to a year and a half to complete the work. North Arkansas counties in which this work is now in progress are Randolph, Lawrence, Sharp, Independence, Fulton, Izard, Stone, Baxter, Marion, Searcy, Newton, Boone, Carroll, Madison, Benton and Washington. There is no doubt but what much new information of both metallic and non-metallic minerals will be uncovered by the surveys.

In an interview, George Branner, state geologist, on the surveys in the North Arkansas counties, said: "We expect the surveys to develop new mineral values, because they take in such a wide scope. The work will be very thorough, covering both metallic and non-metallic minerals that are more or less visible and accessible. These minerals include iron, manganese, zinc, lead, ceramic clays, tripoli, structural materials for road and structural uses, marbles, limestones, dolomite, oil shales, sand, phosphate, and others. Also ground waters, samples of which will be obtained from springs and wells and analyzed for hardness, chlorides and bacterial content."

"Thousands of samples of minerals and water will be gathered and analyzed. We are now building a laboratory at the penitentiary walls for analyzing and testing ceramic clays. All samples in this division will be sent there. The road and structural materials will be analyzed at the state Highway Department's laboratory, and samples of the metallic minerals will be sent direct to the State Geological Survey for testing.

"Not only will the surveys cover field work and analysis, but specific uses for each product will be determined. Besides the mineral survey maps which will be drafted of each county, a report will be printed covering each group of minerals in each region, which will be available to the public."

The final result of these surveys will no doubt present the most vivid picture that has ever been drawn of the mineral resources of this section of the state, and will be an important factor in locating new industries in this locality in the future.

New 'War Emergency' Mineral Found

Gazette 8/29/38

Special to the Gazette.

Hot Springs, Aug. 28.—A new mineral known to geologists as heckomite, said to be of the sodalite family of rocks, is being studied by Miss Jewell J. Glass, Washington, said to be the only optical mineralogist in the country. The new find was located in the Magnet Cove area.

Miss Glass, studying "war emergency minerals," is conducting her investigations for the Department of the Interior. The heckomite came to her attention when a sample was sent to her office for testing. When subjected to violet ray treatment, the mineral was found to be highly phosphorescent and very valuable to collectors of that type of mineral. It is found in large quantities in Magnet Cove, she reported, but the other minerals have been found only in small veins.

Miss Glass will leave here the middle of the week to go into the Ouachita National forest to continue her survey. Although a resident of Washington, she is a Southern woman, born and reared at Meridian, Miss. She is a cousin of Senator Carter Glass of Virginia.

SURVEY OF MINERAL WEALTH UNDER WAY IN 32-COUNTY AREA

Ark. Gazette, April 3, 1938

Thirty-two searching parties aggregating more than 450 men moved methodically over 32 Arkansas counties last week, in pursuit of information concerning the structure of the top-earth that's Arkansas.

Before they are finished, the face of Arkansas will have been scoured by trained men, afoot, with experience and keen powers of observation; hundreds of thousands of specimens of rocks, clays, minerals and whatnots will have been collected and carefully analyzed, and everything found will have been accurately located upon a series of maps.

To handle the job the state, through its Geology Department, has turned prospector, largely with the aid of funds made available for the purpose by the Works Progress Administration.

A business man would call the task an inventory of the state's physical properties.

Sponsors of the project call it an effort to discover "all visible and easily accessible minerals, clays and surface waters, make collections thereof, and map them."

Project Well Organized.

Fantastic in scope, the work actually has been made virtually a routine task—as the building of an ant-hill is a routine task, but believable only after one has watched the ants go methodically through their paces.

The workers take the field, with maps and report sheets, three groups to each party, each directed by a trained supervisor. And it's no hit or miss proposition with them. They know what they are looking for. Each group goes over the same territory, one after another, each seeking different things.

What is discovered is located on a map—the prospectors using compasses, and making their locations by measurement from section corners, and other known locations. The parties average 15 square miles a week.

Specimens Collected.

Specimens are collected as the parties proceed. The reports are collected first at district offices. Slowly, the data, maps, specimens and all other information is moved funnel-like through the Geology Department offices, where it will be crystallized, collated finally and published as permanent, public information.

Information Valuable.

The work is costing the federal government about \$16,000 a month, but the Arkansas survey was not undertaken until a similar project in Oklahoma had been completed and its results established.

A rough idea of the enormous volume of information of decidedly permanent value is suggested in one phase of the survey which calls for location of all road materials, clays, building materials, surface waters, metallic and non-metallic minerals.

What the survey means to the Geological Department is amply expressed in the words of George C. Branner, state geologist:

"You just can't beat information obtained by men in shoes, using sharp eyes, going over every inch of ground you want to know something about."

Test Holes Drilled.

But to get back to the procedure. After each party of three groups goes a follow up crew, to do what digging is necessary—with augurs, drills, shovels or whatever the job calls for. About 20 feet is the average maximum depth for work by the follow up crew, but, when extended, they have managed to get down as far as 40 feet several times for a specimen, or to test depth of certain mineral deposits.

There is not much danger of the followup crews striking oil, an official explained.

When the Highway Department first heard rumors that the survey was to be made, officials rushed to Branner's

office, with the plea that maps showing locations of sand, gravel and other road materials be sent them.

They'll get them, soon enough.

52 Counties Benefit.

The Geology Department is going about the task as if it were two jobs.

First—now, that is—a survey is being made of the earth in 52 counties, comprising 44 per cent of the surface of the state. In this area chances for discovery of mineral value are considered far greater than in the other section. This area included lies in the northern, northwestern, western sections and parts of southwestern and central Arkansas.

In the second section will be the Arkansas River Valley, except the coal mine areas, which are included in the first, and the flat and rolling portions of the coastal plain in eastern and southeastern Arkansas.

Work is now under way in the following counties: Washington, Benton, Newton, Madison, Carroll, Marion, Searcy, Stone, Izard, Independence, Sharp, Randolph, Pike, Garland, Scott, Saline, Pulaski, Hot Spring, Clark, Howard, Polk, St. Francis, Cross, Lee, Dallas, Perry, Baxter, Boone, Franklin, Fulton, Lawrence and Phillips.

Officials hope to complete the entire job in about a year.

Pictures to Be Used.

Arrangements have been made through volunteers to do a vast deal of picture-taking. It was considered probable that large areas covered by the crews have never before been explored completely by white men.

Officials declined to comment upon effect their work might have upon large numbers of wildlife throughout the state.

"I guess the birds, beasts, fowl, fish and varmints will realize we are not moving into their territories permanently," one official smiled. "At any rate, I hope none of the bob cats, or bears, if many are left, take it upon themselves to discourage the search."

On the human side of the gigantic search for the mineral in the rock-pile, it was observed that the survey will offer not only work but a vast amount of valuable experience to the men and women employed.

Expert draftsmen, mappers, computers and the like will be developed in the course of the survey.

In charge of the survey is R. C. Beckstrom, who directed the mineral survey of Oklahoma. Sponsor is the state Geology Department, headed by Geologist George C. Branner.

Mineral Surveys

Aiding Arkansas Democrat Sept-1938

Valuable deposits of sand and gravel available for road construction and rich showings of fossil oysters of high value in liming soils have been uncovered in the statewide mineral survey sponsored by the state Geological Department, Dr. George C. Branner, state geologist, reported yesterday upon his return from the Crowley's Ridge section in eastern Arkansas.

The deposits, he said, lie mainly in St. Francis county, north of Forrest City. The fossil oyster beds are being mapped by the mineral survey to definitely determine their length and depth.

A two-day trip over the Crowley's Ridge area, in Craighead, Poinsett and St. Francis counties, was made by Dr. Branner in company with H. A. Nash, Craighead county survey supervisor; I. W. Merritt, Poinsett county supervisor, and Lewis Bohlinger, supervisor for St. Francis county, in the extensive survey program.

In addition to the fossil and sand and gravel showings, the survey has found valuable clays, Fuller's earth, lignite and ochre.

The state's mineral survey is now extended into 35 counties with 565 persons employed. The survey is 25 to 30 per cent complete, Mr. Branner said.

ASPHALT CONTRIBUTING MUCH TO PROGRESS OF CIVILIZATION, HISTORY OF INDUSTRY SHOWS

"Gazette" May 29, 1938. Little Rock, Arkansas

Back in the days when Nebuchadnezzar was restoring Babylon to its former glory, he used asphalt to pave the streets.

Centuries later, America's oil industry began where the king of the Chaldeans left off and has developed a product that has now paved 80 per cent of American city streets and 64 per cent of the modern surfaces on our state highways.

The Lion Oil Refining Company is playing an important part in its contribution to American progress through the distribution of its many types of asphalt. Col. T. H. Barton, president, points out.

The history of the asphalt industry is the story of constantly increasing research to bring about an improved product at lower cost. Recognition of this fact is found in the records which reflect that in 1927 there were only about 20,000 miles in state highway systems built of asphalt; a third of the total improved roads. In 10 years mileage improved with asphalt had increased to 160,000 miles, or more than 64 per cent of the total roads better than plain water-bound macadam or gravel. This is an increase in use of more than 700 per cent.

Growth of the industry is realized when it is considered that in 1913 only 436,500 tons of petroleum asphalt were produced, while 25 years later, in 1937,

more than 5,640,000 tons, an increase of more than 1,300 per cent, were produced. From 1929 to 1937 the use of asphalt in construction and upkeep of highways increased from 56 per cent of the total materials consumed to 69.6 per cent.

Price Trend Downward.

The asphalt market has always been highly competitive, but the price trend has been downward. Paradoxical as it may seem while the average value per ton of petroleum asphalt in 1927 with the comparatively low consumption for state highway work was \$14.14 per ton (this figure being arrived at by dividing the total value by the total tons) in 1836 the value figured in the same way was only \$10.10 per ton in spite of the enormous increase in the demand.

Not only has the value of the product itself curved downward in the past decade, but the cost of asphalt pavements of the highest type has likewise been decreased. In a tabulation presented by Thomas H. McDonald, chief of the United States Bureau of Public Roads, at the recent hearing before the Committee on Roads of the House of Representatives, it was shown that while the cost per mile of bituminous concrete top was \$12,085 in 1933 it dropped to \$8,213 in 1937.

Asphalt has been a tremendous factor in the rapid development of more than 100,000 miles of a vast farm-to-market highway system, providing the farmer with all-weather, dustless, mudless roads at low cost. This has been made possible by the fact that asphalt is itself not a type of pavement but is a binding medium which can readily be used with any local materials available and provide a surface or a base of any thickness. Consequently the pavement may be anything from a surface treated macadam or gravel road through various designs until we arrive at the highest type such as is constructed for the Fifth avenues of America.

One of the most important contributions of the asphalt industry to highway development and to lowering the cost of highways has been in the production of a range of products which could be used by means of solvents without requiring the application of heat. These solvents known as cutbacks thin the asphalt to the proper consistency and when the stone or gravel aggregate is coated the more or less volatile solvents evaporate, leaving the powerful cement in place. The industry has classified these liquid products into slow-curing, medium-curing and rapid-curing groups, and has standardized their use according to the type of mineral aggregate to be used.

Equipment Aids.

There has been a remarkable development in asphalt highway equipment for applying the product in either hot or cold form to the roadway. New plants now take the stone or gravel from the roadway mechanically and, after mixing it thoroughly with the asphalt, lay it down in a finished pavement more quickly and cheaply than formerly.

The hot mix asphalt pavements, which require hot asphalt and heated stone, sand or gravel, have also been improved in quality and lowered in cost by reason of the development in asphalt equipment and through the application of research to produce and proportion asphalt to serve the variety of needs.

One of the contributions to economy and speed in the road building program has been provided through what is known as "stage" construction whereby the initial improvement satisfactorily serves light traffic needs for a time, and then as traffic increases, becomes a base for the next increment of paving, until a pavement of the highest type is ultimately achieved while utilizing the pavement stage by stage.

Such "stage" construction is only possible with the use of asphalt materials and has two great advantages. First, it means that each stage can be accurately designed to carry the traffic that is operating at the time of construction, and second, it obviates the high interest charges involved when an expensive, rigid type pavement is put down in anticipation of future traffic. "Stage construction" means that the road is built up to its traffic, rather than waiting for traffic to be built up to the road.

One of the most far-reaching highway developments within the last few years has been the "stabilizing" of soils—more popularly known as the "upside down" method of road construction. This simply means that soils under all kinds of pavements can be specially treated so as to prevent their being weakened by capillary water moving upwards through the soil.

Asphalt, an entirely waterproof binding material, has been used recently in various methods of mixing with the sub-grade soil, thus serving as an insulating blanket to stop the menace of the water coming up from below. So successful has this revolutionary method of road building become, that many of our lightly traveled country roads are being made entirely suitable for traffic with only this "stabilizing" process, and without the addition of an actual pavement surface.

Many Other Uses.

Asphalt today provides about two-thirds of America's roofing requirements, the surfacing of about 90 per cent of the modern airports and is very widely used for playgrounds, tennis courts, sidewalks and many industrial uses.

Another comparatively new use for asphalt has been a reinforcement for stone jetties. Army engineers have completed a successful experiment at Galveston, where a five-mile jetty extending into the Gulf of Mexico has been rendered non-porous by the use of asphalt cement to hold stones together. This has prevented the harbor from filling up with sand and also protects the harbor from excessive wave action

that formerly leaked right through the old jetty.

Even when the engineers on the Mississippi proved the possibility of molding asphalt sheets and placing them hot for underwater revetments, the experience was not considered conclusive because the molding of the hot material was still a dry operation. But at Galveston the full step was taken of depositing the hot material under water in bulk to settle, take form and solidify under its own weight—and a new construction method was added to those available for underwater work.

Adaptability Valuable.

This remarkable product of petroleum is curiously immune to practically all the destructive forces which obliterate the works of man. Thus it is acid proof and is highly fire resistant; it is proof against destruction by abrasion and by impact; it is scarcely susceptible to weathering or oxidation, and it preserves its tremendous cementing strength for thousands of years.

Its adaptability to so many uses, its availability in any form from liquid to solid, its wide occurrence and its low cost will give it a future of almost incalculable extent.

It has been a sort of "ugly duckling" among the petroleum products but it is not unlikely that there will come a time when intrinsically it will have a higher value per unit than the major products of the industry.

Iron Ore Reported In Izard County

Gazette 6-6-38

Special to the Gazette.

Sylamore, Ark., June 4.—Indications are that the hills in the south end of Izard county, near here, may prove to be filled with a paying quantity of iron ore.

B. W. Messing has opened a mine in the vicinity of Twin Creek and more than 50 tons of ore has been mined and delivered to the railroad near Guion, it is reported. It is understood the Missouri Pacific Lines will build a switch to make for convenience in loading the ore onto the cars for shipment. Messing is reported to have leased several thousand acres of land which he expects to develop.

Another mind probably will be opened soon by J. F. Barnett, who reports he found an unlimited amount of ore on his place. The test of the ore on the Barnett place is said to be high.

Some of the rocks in this vicinity are said to show traces of several valuable minerals, including manganese. Ore mined on the Barnett place will be brought to Sylamore for shipment.

Finding of iron ore in this section serves to lengthen the mining field which has been a paying proposition around Cushman, in the northern end of Independence and the southern end of Izard county, for many years.

There are hundreds of acres of land in this section that is apparently unfit for agriculture and if ore is found in paying quantities the picture undoubtedly will be changed.

The Cushman field is a manganese center and the fact that the Izard county mining is within a short distance of the Cushman field is all the more reason that there is a possibility of enough manganese showing up along with the iron ore to make the work doubly profitable.

In pre-Civil war days many of the natives used lead found in this section to make bullets which they used to kill wild game.

MANY FACTORS SAID TO ENCOURAGE NORTH ARKANSAS INDUSTRY

"Gazette" May 29, 1938, L. R. Arkansas

By PAUL T. WAYLAND.

Special to the Gazette.

Calico Rock, April 28.—With the possibility of hydro-electric dams on some of the principal rivers of north Arkansas, plus the fine network of highways that link the section with neighboring states and free bridges which now span the mountain streams, there is every indication that the Arkansas Ozarks section may realize dreams harbored so long about more industrial development and a higher plane of social living.

The above mentioned factors are decidedly encouraging to industrialists looking for raw country that can be economically developed. In this section they have known for long there awaits an unlimited amount of natural resources that could be developed with ease.

Much of the choice timber in the hills has been cut. Especially is the statement true so far as those tracts that are adjacent to good roads are concerned. However, successful timber men say there are yet thousands of feet of fine timber in the back hills, waiting for the coming of mills and timber workers. There seems to have been a tendency to locate mills near shipping points or good roads because of shipping expense.

As time moves on it begins to appear as if natural resources are unlimited in the hills. When wars occur or there is

a shortage of some particular mineral in other fields, mining promoters hie to the Ozarks, seeking what they need. A survey conducted during the past few weeks has given every indication that additional minerals may be found.

Other Ores Important.

Zinc has for long been an important ore in the northwest part of the state, especially in the vicinity of Rush. It is understood that at one time one of the largest workings of zinc in Arkansas was there. When the demand and the price dropped the activities began to decline. During recent months mining has revived somewhat and conditions are much more promising.

In several sections of north Arkansas, there are deposits of coal, lead and chalk which sooner or later probably will be developed.

One field of fine chalk which has for long been known locally and has upon one occasion been slightly touched by mining interests, is that at Wild Cherry in the south end of Fulton county. A few years ago persons from Kansas came to Wild Cherry, mined a truck load of the chalk, hauled it to Kansas for assay, wrote back in an attempt to lease or buy some land there, and then the flurry died down.

The Wild Cherry chalk is said to be almost pure. There are men who, as boys, dug chalk from the Wild Cherry mine and used it in school as blackboard crayon. Others whittled it to make pipes, dolls and marbles. Commercially, chalk is used in the manufacture of face powders and in certain paints.

There have been reports of lead finds in various localities. A few years ago T. D. Haile of Calico Rock found some lead on his farm near Creswell and shipped some of it away for assay. The report showed it to be almost pure. However, when he started figuring about having it mined he found it would cost more than he could afford because of the low price.

In some of the old caves there is an abundance of guano and of salt peter. Guano, which is in plainer terms, bat-droppings, has proven to be valuable as a fertilizer. Farmers adjacent to a cave where guano is found have experimented with it and prefer it to many commercial fertilizers. In a cave in Stone county, just south of Calico Rock, is a section where saltpeter forms. The visitor may rake the saltpeter from the walls and return later to find that more of the substance has formed.

Out-of-state interests may turn toward the Ozarks for they realize that truly here is the future industrial center of the section. Plenty of fuel, plenty of power, low wages and a healthful climate together with an unlimited amount of raw materials encourages them.

Information available regarding Arkansas's phosphate deposits is inadequate, Mr. Frasier said. Preliminary surveys show they are located in the central-western section of the state, that they are of high grade and of tremendous potential value to the state and farmers of this area.

The request is in line with the program of the American Farm Bureau Federation and with the recommendations made by President Roosevelt in a

special message to Congress for an appropriation to survey the phosphate deposits of the United States to determine the need for conservation.

Dr. Morgan expressed interest in Arkansas's phosphate deposits and the need for preservation of these deposits for the benefit of agriculture in this section when he attended the annual convention of the Arkansas Farm Bureau Federation here last fall and at the Southern regional meeting in Mississippi last summer.

Phosphate Survey For State Asked Gazette 6-21-38

The Arkansas Farm Bureau Federation has asked the Tennessee Valley Authority to make a study of the nature and extent of Arkansas's phosphate deposits, Waldo Frasier, executive secretary, said yesterday.

In a letter to Dr. Harcourt A. Morgan, chairman of the TVA, Mr. Frasier said the request was made "with the hope that such a study might lead to our initiating a movement that would result in the preservation of such deposits as we have, and in the development of methods through which our deposits might be made most readily available for agriculture of this section of the United States."

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'INEVITABLE' DEVELOPMENT SEEN FOR ARKANSAS'S ZINC DEPOSITS; REDUCTION PLANT TO BE SOUGHT

Commercial development of Arkansas's zinc deposits, about which much has been said and written but the exact extent of which has yet to be determined, was seen as "inevitable" by George C. Branner, state geologist, yesterday.

Mr. Branner was questioned concerning possibility of renewal of activity in the state's zinc deposit areas following a district meeting of the state Council of Science and Industry at Harrison Thursday night. At the meeting discussions were held concerning deposits in the state and possibilities of location of an electrolytic ore reduction plant in the zinc deposit areas.

Mr. Branner, who has recently completed a study of zinc ore deposits, zinc production and uses in the United States, reported that the known reserves of recoverable zinc in the nation on January 1, 1938, were "approximately 6,000,000 short tons, at a price of about six cents per pound, at St. Louis, Mo."

Exhaustion of Supply Forecast.

"As the average domestic rate of production in the past 10 years has been 534,822 short tons of recoverable zinc, the estimated reserves will be sufficient to last approximately 11 years, or into 1949," he conjectured.

Proposal For Zinc Smelter Submitted Gazette 6-19-38.

Special to the Gazette.

Yellville, June 18.—A proposal for establishment of an electrolytic zinc and lead smelter in the Ozark mining district was submitted by F. E. Hatch of Little Rock to the Yellville Chamber of Commerce and the Ozark Mine Owners League this week. Mr. Hatch, as patentee of the process, suggested that a plant of 100 tons maximum daily output of refined metal be set up in five units of 20 tons each, and to start with one unit—adding other units as ore production requires.

The daily supply of ore necessary to maintain smelter operation at 20 tons of zinc would be 33 tons of jack or sulphide of 60 per cent grade, or 50 tons of carbonate of 40 per cent grade, it was said. In response to the question of whether such rate of ore supply could be had in this district, the Mine Owners League submitted figures on the record of past production here which show an average daily shipment of 44 tons during the year 1916 and 74 tons daily in 1917. This production was largely from newly-opened mines, the development and equipment of which was slow, since most of them had to depend on returns from sales of current output to finance their way. Because of impassable roads during several months each year, none of the mines was able to get in full time.

"With the decrease of national reserves, the price of the metal may be expected to advance slowly, and with this a more intensive development of the domestic ore deposits should progressively take place. The importation of foreign ore, especially from Canada, may be expected to occur in increasing amounts.

"It is anticipated that, for these reasons, the amount of ore mined from the Arkansas zinc deposits, which are confined principally to Marion, Boone, Newton, Searcy, Lawrence and Sharp counties, will increase progressively during the next decade."

Mr. Branner said a total of 27,424 short tons of recoverable zinc was estimated to have been produced in the Arkansas fields from 1906-1935. The metal was valued at \$5,274,578.

The largest portion of the ore—21,876 short tons of zinc concentrates, of which about one-half was pure zinc—was produced during the World war, in 1917. The price then was from nine to 10 cents a pound at St. Louis. The price now is about four cents. Production then was strictly a matter of price, observers commented.

1917 Development 'A Price Matter.'
Development ceased in the Arkansas fields when the price was depressed as

a result of a sharp decline in demand for the metal at the conclusion of the war. Principal uses of the metal are in the formation of alloys, bronze, and in die castings. More than 30 pounds of the metal is used in the construction of a single automobile, one publication showed.

At present, there are four electrolytic plants for one reduction in the nation—two in Montana, one in Idaho and one in East St. Louis, Ill. The latter plant has been inactive for some time. Zinc produced from such plants is 99.99 pure metal. There are 18 heat treatment plants in the nation now, according to reports. Purity of metal secured from the "roasting plants" is almost as high as that produced through electrolytic processes.

Mr. Branner said an attempt would be made to have a survey made, to determine the exact extent of recoverable zinc—which could be mined economically—by the United States Geological Survey and the Arkansas Geological Survey, co-operatively.

Branner an Authority.

Mr. Branner, a lieutenant colonel in the United States Organized Reserves, has been assigned to the secretary of war to complete studies with reference to mineral deposits and supplies in the nation. His study on zinc was accepted and lauded highly by the Army and Navy Munitions Board recently.

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

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

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

The battery of electric furnaces being used at Pittsburgh test steel alloys used in the high speed machinery of today, such as steam turbines. Before any steel alloys can be employed in the manufacture of such exacting machines, engineers must know exactly how much "creep" will develop. Unexpected metal "creep" in a steam turbine might shut off the electric supply in a factory or community. Steam operating an electric generating turbine rushes into the turbine blades at about 850 degrees Fahrenheit. This terrific heat causes the steel interior to glow a dull red, and the blades and shaft are bathed in this heat. Under the combined action of centrifugal force, steam impact and heat, the grains of the metal slide and the blades "creep." Because the blades of the turbine have only a few thousandths of an inch clearance, it is possible for a little "creep" to be disastrous.

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

Of the 14 state producing manganese, Arkansas ranks with the leading five in the output. The other four leaders are Montana, Minnesota, Virginia and Michigan. But despite the fact that 20 states have manganese deposits, only a small part of this country's consumption comes from within the borders of the

United States. In fact, almost 13 times as much manganese ore is imported as is produced here.

Rarely occurring in a pure state, manganese is grayish white with a reddish tinge, resembling iron. While it is soft in the pure state, it is ordinarily hard and brittle. Use of manganese dates back to the early Egyptians, but it was

not until after the War Between the States that it was produced in large quantities. Even today many countries have not exploited their deposits of manganese ore. Russia produces more than half of the world's supply and India, Brazil and the African Gold Coast produce part of what is used.

Arkansas Leads Production.

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

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

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

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

EXPERIMENTS IN ROCK WOOL MAKING AROUSE GEOLOGICAL INTEREST

"Gazette" 6.26.38

Special to the Gazette.

Cotter, June 25.—If chemists ever develop a formula for putting fiber and strength into rock wool, that would make it adaptable for weaving and wear, North Arkansas, doubtless would be able to furnish raw material for millions of yards of cloth annually, for there are literally millions of tons of dolomite and magnesian limestone, from which rock wool is manufactured, in the territory. Imagine picking up a 20-pound boulder, throwing it into a cupalo and converting it into enough cloth to make a suit of clothes. That is not possible now, but chemists are working on it.

The first Arkansas rock wool was made as an experiment in the White river country last week. Whether manufacture of the product will become an industry in this section is yet to be seen, however.

One of the essentials in the manufacture of rock wool is coke, and it has to be shipped here. It takes a ton of coke to produce a ton of rock wool. Another essential is a well balanced rock. To date no perfectly balanced stone, chemically, has been found in the United States. Recent reports have indicated, however, that stone has been found in Canada that is perfectly balanced.

A chemically perfect stone for the manufacture of rock wool should contain 26 per cent silica, 14 per cent alumina, 16 per cent calcium, 10 per cent magnesia and three and eight-tenths per cent iron, chemists say.

Rock wool is produced under a terrific heat. The raw stone is placed in alternate layers in a cupalo with coke, and the charge fired under a heavy blast and brought up to a temperature

of approximately 3,000 degrees Fahrenheit. It melts at this temperature and as it pours from the cupalo, a jet of steam under high pressure strikes it converting it into wool. The force of the steam carries it into an adjoining section or storage room, as its chemical form is changed. Magnesia is necessary in the rock because it is combustible.

Much Stone Available.

Magnesian limestone from which rock wool could be manufactured occurs in many North Arkansas counties. It is present in Izard, Stone, Marion, Baxter, Fulton, Boone, Searcy, Newton, Benton, Washington and others. In a report by the late John C. Branner, as state geologist, on these limestones, he said: "The principal varieties of the magnesian limestones in North Arkansas, are light gray, almost white, cream colored, and a dark gray becoming almost black in places. The last variety is highly silicious and is charged with carbonaceous matter which gives it its dark color. The gray and cream colored varieties are important from an economic standpoint, as excellent building stone of both colors is obtained at various places over the area."

There were a number of large magnesian limestone quarries in North Arkansas back in the 'nineties, before the use of cement became so popular. The stone was shipped to nearby cities for use as flagging, curbing and sewer caps. Many buildings at Eureka Springs that are still standing were constructed from this material.

The chemical properties of these stones lack certain of the necessary elements for a perfect stone for the manufacture of rock wool, but they contain the essential ones. Several types run as high as from 24 to 40 per cent magnesia, 32 to 48 per cent calcium, and 13 per cent silica, with no alumina.

Used for Insulation Now.

Rock wool is being used now largely for insulation purposes. In summer, houses insulated with it are cooler, and in winter, warmer. It appears to have the characteristics of the raw material from which it is made. Did you ever notice the difference in temperature in the summer time when you walked into a stone house? It is the heat resisting stone walls that make the difference.

A man familiar with the manufacture of rock wool said here recently: "Most any limestone rock that contains silica and magnesia will produce rock wool, but not at a profit. If the essentials are not present in sufficient quantities they have to be added, and this increases the cost of the product. Fuel, too, is one of the principal items of overhead. It takes about a ton of coke to produce one ton of rock wool. About the best that has even been done, where the conditions were excellent and the rock was rather well balanced, was one ton of wool from 1,800 pounds of coke."

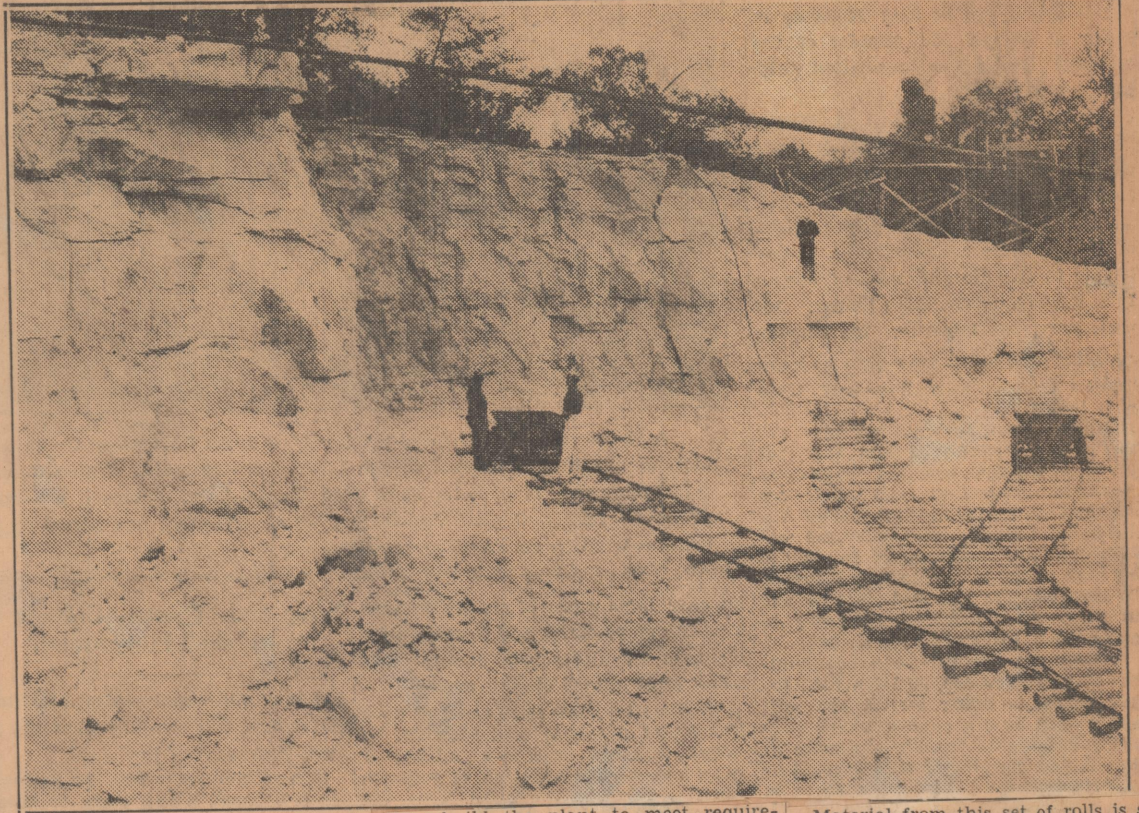
"The cupalos in which the rock is fired are rather expensive to keep up and this adds to the cost. Then there is the cost of labor at the plant, quarrying and getting the rock to point of manufacture, all of which adds to the overhead. Color, too, is an important quality in the product. It should be a pearly white. Foreign substances in the stone might affect the color. An uneven heat also affects it. While the color does not affect the quality of the wool, a clean, white, pearly product just naturally sells better than a dark off-shade."

It is possible that a thorough search for a balanced stone in North Arkansas would disclose a perfect stone for the manufacture of rock wool. While the metallic minerals and commercial stones have been given a rather thorough going over by geologists, the magnesian limestones and dolomites have not been examined so carefully. It is hoped that mineral surveys which are being made now may discover a stone valuable for the use.

Any plant manufacturing rock wool in North Arkansas would have a favorable market arrangement, as none is being made now in the South.

HOW SILICA SAND FROM A NORTH ARKANSAS QUARRY FINDS ITS WAY TO THE WORLD'S GLASS FACTORIES

Gazette 7-21-38



By FRANCES SHIRAS.

Everton, July 23.—The story of the development of the Everton Silica Sand Company Inc., one of north Arkansas's largest and most interesting industries, is one of advancement despite adverse circumstances of years of economic depression. Its growth illustrates what can be done with a valuable raw material and a moderate amount of capital.

The presence of a St. Peter deposit of silica sand in the vicinity of Everton has been known for many years, but development of the deposit and manufacture of the finished sand has been long delayed because considerable investment was necessary to make such development.

Test Shows Sands "Exceptional."

Numerous technical and detailed tests proved that the sand from the deposit was of excellent quality in chemical analysis and grain size tests. A man experienced in judging silica deposits made the following statement in reference to the purity of the four samples of Everton sand:

"We have received the Sharp-Schurtz reports on the analysis made of the four samples of Everton, Ark., sand and I desire to say that without a doubt this is the purest silica glass sand I have ever heard of. In addition to the exceptional purity of the article, it likewise is of exceptional uniform size."

The deposit is in a hard, solid stratum formation. The silicate carries an average of approximately 18 feet thick and continues a distance of approximately three miles through a mountain. The deposit outcrops around the edge of the mountain and at the point of present operation it has been worked by stripping the top of the bluff to a point where it is safe and practical to proceed with drift mining, there being a solid formation of limestone directly above the silica sand deposit as well as is there present solid limestone underlying throughout the silicate to a depth of approximately 68 feet, where another stratum formation of silicate some nine feet thick is present. This nine-foot seam could be consistently mined or removed by tunneling into the mountain.

Development of Company.

In March, 1935, the Everton Silica Sand Company, Inc., was formed and construction of a plant attempted with a moderate sum of money. In April, 1936, the ownership of the company changed hands. The silica deposit was by far the most valuable asset the corporation possessed and even though considerable machinery and equipment had been installed, it was not workable because the machinery and equipment was in poor condition and improperly installed. Much of it was second-hand or discarded equipment from abandoned mines and it was necessary practically

to rebuild the plant to meet requirements of new, practical methods. H. C. Ormond, now 33, had acquired the controlling interest of the corporation and managed in detail the entire reconstruction of the plant.

It was necessary for Mr. Ormond also to work out the entire structure of a marketing program, as before that time practically no sand had been marketed. This has been successfully accomplished and the company has customers in Missouri, Kansas, Oklahoma, Texas, Louisiana, Mississippi, Tennessee, Arkansas, and Old Mexico, to which hundreds of carloads of clean, white silica sand have been shipped in paper-lined Class 9 boxcars over the Missouri and Arkansas railway from Everton.

Uses of Sand.

The sand is used in the manufacture of practically all kinds of glassware, as well as by foundries throughout the country which use it in the construction of forms in their casting works. It is also used in large quantities in the manufacture of silicates of soda. The users of the product must be convinced that the sand is desirable for their use, then furnace tests are made. After it has been thoroughly tested and approved as to the different characteristics of the sand, a regular customer and user of the product is finally attained.

While the plant has been efficiently constructed and satisfactory sales of the product, Mr. Ormond is continuously improving operating conditions and surveying with a view of expanding the company's market.

Because of the unique location of the plant on the side of the great silicate bluff directly above Clear creek, from which comes water and power, and nearness of the railway over which the product is shipped, the manufacture and loading of the product is highly efficient.

Mining and Processing Operations.

The top stratum is drilled with jack hammers and shot with dynamite, bringing the material down in as fine a mass as possible. The mass is then shoveled into bottom-drum mining cars and transported to the quarry bin which holds approximately 500 tons. The material is dragged from the quarry bin with a large double drum hoist and is fed into the jaws of a crusher from which it travels to a large trommel (rotary screen) with .027 inch openings. Material too large for the openings in the screen rides over and goes directly to a large set of crusher rolls where it is given a second crushing. It is then placed in a large elevator and carried to the top of the crushing washing plant. It is then discharged into another trommel screen and any material too large for the openings in this screen rides over directly into another and separate set of crusher rolls.

Material from this set of rolls is sent back to the first screen—thus completing a circuit in the crushing-washing process which compels the little grains of sand finally to find their way through the openings of the screen jackets.

An abundance of clear water is added to the material when it enters the crusher and large streams of water are played upon the inside of both rotary screens. The rotary screens give the sand a thorough washing. (Rotary screens have a higher operating cost than do flat screens, but give a higher degree of washing efficiency.) From the two screens the sand goes through a launder (flume) to a large dehydrating tank where the current is slowed down, permitting strained, dirty water to overflow.

The clean white sand is discharged from the bottom of the cleansing tank. Another stream of approximately 500 gallons of clear water per minute washes it down a launder to the drying plant 800 feet below on the railroad.

The sand receives thorough rinsing in this journey and when it reaches the draining bin it settles in the bottom, the water running out of a number of holes up and down the sides of the bin. The holes are plugged as the sand attains depth to prevent it from escaping. There are two draining bins, each 10 by 12 by 80 feet. Each holds approximately six 55-ton cars of sand. The sand is then dried in a large rotary drier with a direct crude oil flame. From

the drier the sand is elevated to the top of the drying plant and goes through screens to storage bins from which it is spouted by gravity into paper-lined box cars for shipment.

Gives Credit to L. A. Watkins.

Development of the plant has been a hard "up-hill" job, but Mr. Ormond has had much encouragement. He said: "L. A. Watkins, executive vice president of the Missouri and Arkansas railway, is responsible for the existence of this new industry on his line. He has cooperated and worked patiently to the end that there actually is in existence and operation a silica sand plant on his railroad, and accomplishment of which has paid four-fold for the work and time necessary for its development. The idea behind his endeavor has been progress for Arkansas, work for many men, business for the railroad and for the communities it served."

Mr. Ormond's philosophy explains one reason why the Everton Silica Sand Company has grown so during the past two years under his management. He says, "An optimist is a person who conceives a practical proposition and has the everlasting 'never-quit' ability to work to the end that it is successfully accomplished. And I believe that if one so desires anything in reason can be accomplished if one works hard enough at the job."

Production Of Cinnabar Possible

July 26-38

Cinnabar "probably can be produced" in Arkansas "at a profit under conditions similar to those of 1936 provided the enterprise is not burdened by too great an expense in the finding of ore bodies similar to some already mined," the Geological Survey of the federal Department of the Interior reported yesterday in a report on the "Geology and Ore Deposits of the Southwest Arkansas Quicksilver District."

The report said "Geologic indications appear to warrant further prospecting and development in favorable areas. It seems likely that in a time of national emergency, when cost is no obstacle, the Arkansas district can produce a large amount of quicksilver."

It was recalled that cinnabar was discovered near the southern border of the Ouachita mountains in 1930. "The belt in which cinnabar is now known has a length of more than 25 miles from east to west, and in most places is less than a mile wide, although it has a maximum width of about six miles."

Authors of the Arkansas report said the United States ordinarily produces only about half the quicksilver it consumes.

They said "Any new source of this essential metal is therefore of relatively great importance. For this reason, and because of the possibility of financial gain attending the development of any new mining district, the Arkansas

quicksilver district has attracted considerable attention from geologists, mining engineers and others * * *"

VAST NEW FIELDS OF MINERAL ORES FOUND BY STATE SURVEYORS

Gazette July 1938

Special to the Gazette.

Mountain View, July 9.—The state mineral survey, under the supervision of the Arkansas Geological Survey, which has been in progress for several months, is disclosing vast tonnages of non-metallic minerals in north Arkansas, and is adding a great deal of new, useful knowledge about the existing metallic mineral deposits in the section. Enormous deposits of road building and construction materials have been found scattered widely over a large area in the Upper White river country. These consist of limestone for the manufacture of burned lime, crushing rock for concrete aggregate and other purposes. Silicious limestone for the manufacture of rock wool. Gravel that is well adapted for concrete aggregate and other construction purposes, and decorative marbles of several varieties, which have a wide range in colors and textures.

An exhibit of marbles that are found in north Arkansas will probably be taken to the New York World's Fair. A project for this purpose has been filed and probably will be approved. Joe Pfeiffer, pioneer marble man of Batesville, who is well acquainted with all the varieties of marble in this section, will have charge of assembling the exhibit. It will contain approximately 150 different colors and textures.

Ceramic Clays.

Few deposits of ceramic clays have been found in the region. One of definite value has been located in Fulton county, near Mammoth Spring. It is a pure white fire clay, with a high alumina content, which will take high temperatures and make beautiful, pure white fire brick. Some of this clay has been manufactured into a water paint, in the past, by grinding it and adding glue. It serves this purpose well.

Probably the most important discovery in the non-metallic minerals made by the present survey was that of two large bodies of silicious limestone suitable for the manufacture of rock wool.

The University of Illinois has done a considerable amount of research during the last few years on rock wool material, and according to their report, the two deposits found here are perfectly balanced. They have all of the necessary elements. One of the elements that is nearly always deficient is alumina. The stone from these two deposits has the alumina requirement.

Phosphate Rock.

The survey has also disclosed a considerable amount of phosphate rock in Izard and Independence counties. This will probably prove valuable as a material for the manufacture of fertilizer and chemicals.

There have been no gold or silver ores or other precious minerals discovered. This supports a report made by John C. Branner, former state geologist. A gold and silver survey was made in the late Eighties. Some silver was found but no gold.

Peculiar Metallic Mineral.

A peculiar metallic mineral has been found near Center, in Sharp county. A large quantity of metallic nuggets and small boulders, covering an area of approximately two square miles, that can't be accounted for geologically. They contain a large amount of iron, and the material is being analyzed for other elements. The nuggets resemble metallic meteorites, and it may be that at sometime in the distant past the area was pelted with a metallic meteorite shower.

The survey has also disclosed an enormous tonnage of iron ore in north Arkansas, which may, at sometime in the future be of tremendous economic importance. It has little value now because it is located too far from the iron and steel centers of the nation.

With the exception of some manganese ore found in Stone county, no manganese of any consequence has been found outside the Batesville-Cushman district, in Independence and Izard counties.

Progress in Mapping Mineral Deposits Summarized. Gazette 7-14-38

Progress in mapping mineral deposits of the state in a WPA project under supervision of Dr. George C. Branner, state geologist, and R. C. Beckstrom, WPA supervisor, was summarized by Dr. Branner yesterday in a progress report covering 1,557 square miles in 10 counties. There are 154 persons employed in making the survey.

Group county meetings of mineral survey workers have been held recently at Arkadelphia and Hot Springs. Progress was reported as follows:

List gives name of county, name of supervisor, number of square miles completed, per cent complete and minerals mapped.

Garland county, Jas. K. Riffle Jr., 159 square miles, 22 per cent complete; novaculite, quartzite, clays, fullers earth, tripoli.

Polk, Compere Pipkin, 216 square miles, 25 per cent complete; slates, novaculite, tripoli, building stone, gravel, clays.

Scott, Lewis C. Crutchfield, 175 square miles, 58 per cent complete; limestone, sandstone, slates, clays, building stone.

Saline, Francis M. Gribble, 163 square miles, 22 per cent complete; Bentonite, bauxite, ochre, clays, fullers earth, soapstone, gravel.

Hot Spring, Lewis M. Hannum, 97 square miles, 16 per cent complete;

titanium, barite, fullers earth, building stone, lead, tripoli.

Sebastian, W. E. Womble, 220 square miles, 47 per cent complete; building stone, clays, shales, coals.

Howard, Joseph Rankin, 145 square miles, 29 per cent complete; quicksilver, antimony, chalk, marl, greensand, clays, gravel.

Pike, Arlington Waggoner, 155 square miles, 25 per cent complete; quicksilver, gypsum, clays, gravels, asphalt, building stone.

Clark, Robert W. Osborne, 156 square miles, 18 per cent complete; clays, marl, gravel, quicksilver, building stone.

Dallas, Oscar Suggs, 71 square miles, 20 per cent complete; clays, fullers earth, sand and gravel.

Local Mining Activities Are Recalled

Aug. 1938

By BOB BERRY

Revival of memories now twenty years old, and a possibility there may be a new development of mineral resources in the Ouachitas, came about through recent reading of a news story in the Arkansas Gazette.

In 1918 at this same period of the year, there was a decided public interest in the Mena Mining Field. It was the time of war and the United States government had asked that certain minerals, notably manganese, be located and produced at home, in order to assure a supply necessary for steel making.

Because manganese at that time was principally an imported material, a patriotic cry "help win the war" was sounded along with a plea for the location of a domestic supply of this needed material.

It was known there were undeveloped beds of manganese in the Ouachitas southeast of Mena, and the month of September in 1918 saw what may best be described as a mining boom. The end of the world war in November, made this development short lived, and the manganese located twenty years ago was permitted to remain unmolested, for the promoters realized without government aid they could do little toward development.

But now conditions have changed. The State of Arkansas is sponsoring a mineral survey, using WPA labor, and the people have become mineral minded again. At least this is indicated in the recent news article in the Gazette, which directs attention to a Little Rock corporation, getting ready to operate a mining property that was started back in the early days.

This property is located in the Ouachita National Forest in Montgomery county near the line of Polk. To Mena residents interested in mining, it is known as the Dr. Dale copper mine, having been owned principally by that Texarkana physician, who died some years ago.

C. R. Montgomery, then of Mena, but now of California, was in charge of the mining operations. Jimmy Sanders, assistant in the present mineral survey, was one of the old timers that helped make the tunnel and shafts that were created on Dr. Dale's holdings. To reach the property will be much easier than it was twenty years ago, for No. 8 is rated as a highway, which it wasn't in 1918. The Crooked Creek road, built in recent years by the forestry service and CCC labor, now provides a good route almost to the scene of this long ago mining operations.

Possibly these road improvements have helped the decision to rework this property once owned by Dr. Dale, under the direction of the Arkansas Copper company, recently incorporated. According to the Gazette, Dr. W. C. Stenger of Little Rock is general manager of the company, and he is quoted as saying plans are being made for construction of a mill at the mine, which is southwest of Norman and southeast of Mena.

The Gazette article also gives the following additional details:

"The mill, which would be powered by a Diesel engine, would have a capacity for reducing daily 15 tons of mineral ore into a concentrate for shipment to refineries for final processing before marketing.

"The ore would be crushed into a powder, to be run through a flotation system for extraction of the minerals by chemicals. The capacity of the mill, as designed, could be increased.

"Tests show the mine's ore to possess a value of from \$15 to \$160 per ton in copper, gold and silver, officials said. The copper content varies from seven to 92 per cent.

"The mine was opened during the World war by a company in search of manganese. About \$150,000 was said to have been spent in erecting a large plant and in boring a tunnel about 850 feet long into the side of a mountain at a point about 150 feet from its top.

"Two shafts, one 90 feet deep and another 72 feet deep, have been sunk in the tunnel, about 650 feet from its entrance, at a point where a "fault" occurs.

"The second shaft follows a vein of ore about six feet wide. The company plans to sink the shaft 150 feet deeper to the 'geological water level,' where it is believed the richest deposit will be found.

"The company has leased the mine. Dr. Stenger predicted that the opening of operations in Montgomery county will be the forerunner of a greater mining development in Arkansas.

"Enactment of a proposed workmen's compensation law and the tax-exemption proposal, and the equalization of freight rates to enable the Southwest to compete with other sections of the country, would remove obstacles to mining development, he said. Temporary officers in addition to Dr. Stenger are Dr. J. D. Jordan, Little Rock dentist, president, and Miss Elizabeth Nelson of Little Rock, secretary-treasurer."

Paleontology Experts Visit

9-8-38
Arkansas
Ark Gazette.

Somewhere along Little Crow creek, two miles east of Forrest City, St. Francis county, there existed some 75,000,000 years ago marine animals such as the primitive whale.

Pioneer citizens of that community probably could not be convinced of that statement but there came to Little Rock yesterday three persons who have proof that such animals existed.

They are Dr. Gilbert D. Harris, professor emeritus of paleontology and stratigraphic geology of Cornell University; E. Laurence Palmer, assistant professor of rural education at Cornell University and Mrs. Palmer, said by Dr. Harris to be one of the outstanding paleontology research workers in the world. All live at Ithaca, N. Y., site of the university.

They left Ithaca in a car Friday noon and arrived in Arkansas Tuesday afternoon. When they reached Little Rock they had traveled 1,476 miles. They are on a month's trip to do research work in Arkansas, Louisiana and Mississippi along geological lines. They are paleontologists and paleontology is a science that deals with the life of past geological periods.

Display Arkansas Finds.

A Gazette reporter was introduced to the visitors at the Alamo Plaza court last night by Dr. George C. Branner, state geologist. The New Yorkers displayed a collection of fossil shells along with the vertebrae of a large primitive whale, which they found around Little Crow creek. They plan to remain in Little Rock until noon today and then will visit White Bluffs near Redfield, Jefferson county. Their trip in Arkansas will take them through Cleveland county, El Dorado and to Shreveport, La.

Dr. Harris, 74, recalled that in 1892 he began work on a geological survey for Arkansas which was completed several years later. The report when published was titled, "Tertiary Formations of Southern Arkansas." At present Dr. Harris is interested in the development of the Paleontological Research Society which he founded in 1932.

Specimens To Be Studied.

When the month's research trip is completed, fossil specimens collected by the geologists will be taken to Ithaca to be studied. Mrs. Palmer explained that study of the collections will determine the probable number of geological formations existing in the area of the three states.

She explained that fossil collections are traces of impressions of an animal or a plant of past geological ages.

Through the geologists' work many natural resources are discovered and existing resources further developed, Dr. Branner said.

Optimism In Zinc-Lead Mining Area

Gazette 9/18/38

Special to the Gazette.

Yellville, Sept. 17.—A feeling of optimism among those interested in the zinc and lead mining industry, in view of the late improvement in some of the heavy industries, such as steel, automobiles and the building trades, all of which draw heavily on zinc stocks under normal business activities, is evident in this area.

Under the slump which had prevailed since August, 1937, zinc production has been cut short by reason of curtailed demand, together with decline of ore price levels below cost of production at a profit. J. H. Hand of Yellville, a mining engineer, who has been actively engaged for several years in helping to promote mineral development in Arkansas, and particularly in the Ozark zinc region, said here today.

During 1936-37 renewal of activities for zinc production made considerable headway, mostly in the Rush creek district and vicinity, near Yellville, Marion county, and out from St. Joe, in Searcy county, Mr. Hand said. During the first nine months of 1937, around 1,000 tons of free high-grade zinc ore was mined and sold by local miners while they were developing new ore bodies, mostly on several locations. The ore brought a gross price of about \$20 a ton without having to be milled, while the only equipment for mining, as a rule, consisted of picks, shovels, and a little dynamite.

Ore Sold at Diggings.

The miners sold their ore to local buyers at their diggings, realizing a living wage from their output. As an example, one miner who made a crop in the meantime, produced and sold \$250 worth of ore between the first of February and October from his lease. During the two years, several outside enterprises became interested in mining projects on a substantial scale, some of them acquiring leases and starting erection of mine and mill equipment. But from August to November the price of ore fell off nearly one-half with the result that practically all such operations were suspended.

Responding to the step-up of the past two months in some lines of business, the price of zinc has made perhaps a higher percentage of advance than that of any other basic commodity. The feeling prevails that zinc prices will go still higher as business may improve with the fall season. In that case, a return of development activity in the

Ozark district is assured, as inquiries for mines and leases of merit are being renewed from different states, Mr. Hand said.

Zinc Reserves Getting Low.

Another vital factor that tends to stimulate more interest in the zinc industry, especially in undeveloped territory, is the startling revelation, through a recent world-wide survey, that zinc reserves of the United States and other countries are getting near the point of exhaustion, insofar as the older established centers of zinc production are concerned. The survey referred to, and which commands recognition by government authorities, discloses that zinc reserves in the United States were approximately 6,000,000 tons at the beginning of 1937. With an annual zinc consumption of more than 500,000 tons over a 10-year average in this country, it is apparent that unless new sources of production are opened up, the country soon may face a grave emergency, since zinc is essential in manufacturing industries and in war materials.

Ozark Only Untapped Region.

As far as is known to the mining profession, the Ozark district of North Arkansas is the only untapped area of zinc resources remaining in this country to be developed upon a comprehensive mining scale. Records of past production, resulting mainly from development experiments afford proof that ore deposits are of uniform high quality and commercial extent, where prospect tests have been opened for more than 1,000 feet into the ore formations, while ore output from those works returned profits to operators. From present prospect workings, which barely scratch the ore formations in a few places, a production of approximately 80,000 tons has been realized. Ore reserves now in sight through extent of prospect workings and reasonably anticipated through extensions of those developments onto adjacent grounds, are conservatively estimated by competent mining judges at 1,000,000 tons. As undeveloped ore bearing formations in other areas of the field are explored and proven the extent of ore reserves doubtless will disclose far greater magnitude, as expressed in an opinion by the late Dr. John C. Branner, former state geologist, when he said in his official report on that field: "So far as the extent of the ore deposits is concerned, it is safe to say that it is so great that it is unknown. Prospecting that has been done has not uncovered the hundredth part of the ore bodies."

Establishment of electrolytic smelting works in the Ozark zinc and lead area has received considerable attention in the past year or so, but recession of the past several months has not been inspiring to such projects, and nothing has been done on that line further than selection of an approved location. It is reported that this undertaking is to be renewed as mining conditions improve.

Unusual Night Earth Tremor Shakes City

Democrat 9-17-38

Everything Feared From 'Gas on Stomach' to Millenium.

Little Rock and vicinity became like California in one respect last night at 9:33 o'clock as an earthquake of 30 seconds' duration shocked the city. While the tremor was quite perceptible, there were no injuries and little damage was done.

Reports of the quake also came in from various points throughout the state, and from several cities and towns in Tennessee, Missouri and Oklahoma. The Rev. J. A. Murray, seismotologist at St. John's seminary here, which discontinued operation of its seismograph several months ago, said the quake probably was caused by a slight recurrence of conditions which caused the Madrid (Mo.) earthquake of 1811.

This quake, which dumped the town into the Mississippi river and created several lakes, was the most severe ever recorded in the United States, he said. Father Murray described last night's quake as a "minor disturbance."

Windows Are Broken.
But to thousands of residents of Little Rock, who watched their homes sway enough to shake pictures, rattle dishes and, in some instances, knock glassware from tables and shelves, it was not so "minor." There were reports also that windows were broken and plaster cracked.

The trembling was very pronounced in the upper balcony of the packed Capitol theater—where this reporter was at the time—and one indignant woman addressed some uncomplimentary remarks to a gentleman sitting behind her because she thought he was shaking her seat.

One city dweller laid her momentary dizziness to "gas on the stomach."

The police and fire departments, and the telephone offices, reported that hundreds of calls from excited residents came in after the tremor was felt. Being unaccustomed to the earth upheavals, they were at a loss to know what had happened.

Internes at St. Vincent's infirmary reported that the tremor shook bottles from a table in the laboratory. W. B. Smith, 1510 Battery street, said the quake caused a large crack down the center of stone steps in front of his house.

Negroes See Millenium.

The congregation of the Greater Arch Street (negro) Baptist church had visions of the millenium when the tremor mysteriously rocked walls of the church during services. Another note of religion was injected into the quake excitement by some who recalled the Biblical prophecies of wars and rumors of wars, and "earthquakes in divers places" just before the end.

Residents in the Park Hill area reported the tremor as severe. "Judge" Charles Gaffney, living on Skyline Drive, obligingly settled the matter for one excited neighbor who phoned his home for confirmation of "house rattling," with the information that:

"It's nothing serious. Just the hillside shifting down into Dark Hollow."

Skyline Drive residents proclaimed it a "big night" in which the usual quietude of that wooded section was shattered, what with excitement from the tremor and a box seat for hours afterwards to the Bruce Lumber Company fire, directly south from there.

Telegraphic reports of tremors continued to pour into the Democrat office this morning from cities and towns in all parts of the state, particularly in the northern portions. All placed the time of the shock between 9:30 and 9:40 p. m.

Utilities operations and communication facilities were undisturbed, however. The 35-mile pipeline from Lake Winona, from which the city obtains its water supply, was not damaged. Water Department Engineer Marion L. Crist reported.

Out in south end, near Twenty-eighth and Icard streets, one young man rushed out of his house figuring an automobile had gotten out of control and hit the side of the house. Neighbors mingled in the street, reporting that pictures sway-

ed on the walls and the floor lamps rocked back and forth on their stands.

Looks Under Bed.

One wife told that when the tremor came her spouse crawled out and looked under the bed. Suspicions that not even an earthquake would startle her's to life were confirmed by another, who said that when members of the family rushed about excitedly asking each other the trouble "there he sat, wanting to know what was the matter with us . . . were we crazy?" Another, whose lord and master read placidly through it, declared he sat up the remainder of the night not to miss the second or third tremors which neighbors predicted always followed the first.

Felt Over State.

At Lonoke, some 24 miles east of Little Rock, the quake was reported as rather severe, with the vibration from south to north. The quake was particularly noticeable in two-story houses. Windows were rattled violently, rocking chairs swayed, and it was believed a tremor of very little more violence would have done actual damage. The telephone exchange received many anxious inquiries. One woman reported a clock on a mantelpiece was moved to one side by the quake.

Most towns reporting said the tremor was felt at 9:30. At Marianna the disturbance continued several seconds and even the most substantially built houses were shaken. Harrisburg reported the disturbance lasted about one minute and gave the time as 9:38. The quake there was the first in 15 years.

Walls of homes at DeValls Bluff shook for three minutes, the Democrat's correspondent reported, and the time was given as 9:40.

Eureka Springs reported dishes and furniture rattled by the quake at 9:40.

Helena reported two separate and distinct shocks about 9:30.

At Searcy, shaking of beds aroused those who had retired early, and windows in the most substantial brick homes and at Harding college vibrated.

Cotton Plant reported the time of the earth tremor as 9:35 and the duration 30 seconds. Houses swayed and furniture and pictures on the walls of homes moved. The shock was the most severe felt there in modern times.

A similar report came from Wynne, where buildings shook and pictures rattled on walls at 9:30.

Stuttgart reported the tremors lasted half a minute. Floors in homes swayed, windows and china rattled and early sleepers were awakened. Movement of floors and ceilings was easily discernible. The quake was declared the most severe in a quarter of a century.

Felt in Oklahoma.

Tulsa, Okla. (P)—Slight earth tremors were felt by many Oklahomans last night, but no damage was reported.

The tremors, believed part of a widespread quake which extended through Central Arkansas and Western Tennessee, occurred at 9:33 p. m.

Residents of scattered areas of Southwest Tulsa from the downtown district to the Arkansas river reported having felt slight earth tremors. O. W. Stapleton reported water jiggled from a glass of water on the table on the fourth floor of the First Methodist church. Telephone operators on the fourth floor of their building said the shock moved their roller chairs.

Muskogee residents reported the tremor was felt there. Telephone operators at Okmulgee said they also felt the phenomenon and that it vibrated their switchboards.

Little Rock Gazette 9-18-38

Quake Causes Damage.—Friday night's 30-second earthquake was blamed yesterday for a two-inch wide crack found in a four-inch concrete support to one of the two cannons in front of the arsenal at the City park here. Custodian A. M. Fewell said he was certain the crack was not there Friday night. Each cannon is supported by two four-inch pillars, but none of the other three was damaged.