

## Large Crystal Deposit Found Near Hot Springs.

Special to the Gazette. 10-4-37  
Hot Springs, Oct. 3 (P).—Officials of the Bun Lumber Company tonight announced that a deposit of what is known as the "Hot Springs crystals" had been found six feet under ground on their property about half a mile south of Hot Springs. The deposit, it was said, will aggregate not less than 10 tons of fine crystals.

For many years the "Hot Springs crystals" have been well known all over the country. There is a mountain near Hot Springs that contains a deposit so large that it is known as Crystal mountain. They come in unique clusters and artistic formation. The better crystals have been ground and polished into gems that are noted for radiating a dazzling array of colors.

## Mining Comes "Out of Hole" In Arkansas Democrat 2-20-38

It is an established fact that the mining industry in Arkansas is "coming out of the hole" so to speak. For years, Arkansas has never taken full advantage of its vast resources, authorities say, and during the depression, operation of mines was diminished considerably. The 1929 peak has not been regained but a gradual trend toward that level is said to be in effect.

Reports come from St. Joe, where a deposit of iron pyrites or sulphide of iron has been discovered five miles north of Berryville. Also, marble deposits in Boone and Searcy counties may be developed during 1938, according to word received here. It was said there was also a growing demand for the red St. Joe marble and the pink and gray St. Clair.

Probably the most interesting of the more recent reports of new mining centers came from J. W. Fairchild, who has leased and is operating a crystal quartz mine approximately two and one-half miles east of Little Rock's new water reservoir at Alum Fork.

Mr. Fairchild for the past two months has been extracting huge pieces of crystal quartz from his mine which he believes is the only one of its kind in the state.

The difference, he claims, in his and other mines lies in the fact that pieces of crystal quartz weighing

from 40 to 200 pounds can be obtained.

### Easily Mined.

The quartz is surrounded by loose dirt, making it possible for the mineral to be extracted easily without breaking. Quartz found in many other sections nearby is said to be attached to rock deposits and must be broken before it can be separated.

In Fairchild's opinion, this difference in the earth's formation is chiefly responsible for the character and huge proportions of the mineral he is mining.

The market value of crystal quartz depends to a large degree upon the size of the mineral and its texture, Fairchild says.

The huge pieces are bought mostly by firms manufacturing ornaments. Because of the limited supply of large blocks of quartz, huge ornaments molded from the mineral consequently bring a higher retail value.

But, the manufacture of ornaments is not the only use made of quartz.

### Has Many Uses.

One outstanding use is in laboratory equipment. It is said the mineral is highly resistant to acid and can be made into almost perfect apparatuses for handling of chemicals.

Mr. Fairchild says he also is selling much of it for use in making lens for field glasses bought for the United States army.

Fairchild's mine has brought favorable comment from Dr. George C. Branner, state geologist, who said the quantities of quartz were amazingly large, some as much as 26 inches long and 14 inches thick.

Production is estimated at 10 tons a week, Fairchild says.

Fairchild announces he will build in the near future a modern structure in which he will display particles of the mineral. Later, he will build a booth at Oaklawn Park, Hot Springs, to exhibit his products during the races.

He has extended an invitation to interested parties wishing to inspect the mine. Little Rock motorists may travel out Highway 12 to Paron, turn north for two miles and then turn west, going two and one-half miles.

John Willis is owner of the property on which the mine is located. It was once operated by a now defunct Hot Springs bank.

## Sapphires and Quartz May Make Possible

## Wide Use of Dem. "Invisible Glass" Discovery 2-24-39

By HOWARD W. BLAKESLEE.

(Associated Press Science Editor.)  
New York—Sapphires and quartz, heated until they become vapors, coat ordinary glass so that it becomes almost completely transparent and "invisible."

The melted gems and rock make the strongest coating yet discovered and were announced today as forecasting films which will be "even more rugged than the glass itself."

"Invisible glass," a discovery announced two months ago simultaneously by the General Electric Company and by the Massachusetts Institute of Technology, is the most spectacular advance in use of glass in scientific history.

The coated glass transmits more than 99 per cent of light, against 92 per cent for the best untreated glass. No light can be seen to reflect from this filmed glass. Thousands of commercial uses are in prospect as soon as a permanent film is assured.

Today's announcement, made by C. Hawley Cartwright and A. Francis Turner of M. I. T., to the American Physical Society, appears to solve the making of a film that will stick.

In the original discoveries these two men used evaporation to coat their glass, while General Electric used a dipping method.

Added to the evaporated jewel discovery announced today was another, at Massachusetts Tech, that

films of differing thickness will result equally well in transmitting all the light and stopping reflection. This means that a wider variety of materials can be used and led the Massachusetts men to report:

"The present work on composite films indicates that films may soon be made which will greatly reduce reflection and be even more rugged than the glass itself."

Their report also revealed that the coatings already made are industrially useful for some purposes. These include camera lenses, eyeglasses and optical instruments, where the risk of rubbing is not great.

"It is pleasing to the wearer of glasses," the report stated, "to experience the added transparency and the diminution of light which was sometimes reflected from behind the glasses. The effect of treatment is particularly noticeable when one observes a person wearing the treated glasses. His eyes are much more visible."

Coating of large surfaces like windows and show case glass is not at present feasible by evaporation, the report added. The evaporation must be done in a vacuum.

The report said that calling this glass "invisible" is unfortunate because it still can be seen by reason of the fact that about half of one per cent of light is still reflected. This is not, however, seen as reflected light, but as a barely visible tinge of color.

## Huge Crystals to Be Mounted For Display Purposes.

Special to the Gazette. 4-30-40

Hot Springs, April 29.—Three crystals weighing more than a ton taken from the Crystal mountain area, 24 miles west of here, were shipped to the Smithsonian Institution in Washington, D. C., yesterday by Audrey and Garfield Lewis of Crystal Springs, who said that the stones would be mounted for display purposes. The total weight of the shipment was 3,000 pounds.

## VOLCANOES IN ARKANSAS, BUT QUARTZ VEINS MORE IMPORTANT AT PRESENT Gazette 6-6-43

By MAX HALL.

Washington, June 5 (P).—You know, of course, that there are volcanoes in Arkansas. (Or do you?)

But we'll bet you didn't suspect that the quartz veins, quartz crystals and associated minerals of the Ouachita mountains of Arkansas and Oklahoma are hydrothermal deposits of probable magmatic origin, formed during the closing stage of the mid-Pennsylvanian orogeny. (Whew!)

Now that was sometime ago, and may be considered ancient history, but it has a good deal of importance today, because the quartz crystals which were formed millions of years ago are being used nowadays in two-way radio sets by the army and navy.

Don't ask us to explain the origin of that quartz, because we only quoted that second paragraph from the noted geologist, Hugh D. Miser, who has a booklet just off the press entitled "Quartz Veins in the Ouachita Mountains of Arkansas and Oklahoma (Their Relations to Structure, Metamorphism, and Metallic Deposits)."

We will say, however, that "hydrothermal" has to do with hot water (note that Hot Springs is in that region); "magmatic" has to do with molten rock; an "orogeny" means mountain building, and "Pennsylvanian" refers to a period between the "Mississippian" and "Permian" periods.

Beyond that we absolutely refuse to go. We want to tell you what Mr. Miser says about his hobby. His hobby was what led him to

make a careful study of the Ouachita mountains. His hobby was—but wait, we forgot the volcanoes.

The Arkansas volcanoes are at Murfreesboro, and near Nashville, Lockesburg and a few other places. But don't be afraid. They won't be exploding today. They were active in the Cretaceous age, and the population of Arkansas at that time was rather reptilian.

### Plain Talk—Sometimes.

Now for Mr. Miser's hobby. He is an official of the United States Geological Survey, and a native of Pea Ridge, Ark.

In "Quartz Veins of the Ouachita Mountains, etc.," Mr. Miser occasionally writes a paragraph in plain, ordinary terms, right in the midst of verbiage such as stratigraphy, anticlinorial, dickite, rectorite, chlorite, adularia, laminae, pegmatites, radicularia, rhombohedral calcite and chalcodony, present in the original novaculite.

One such paragraph says the author began his hobby—the collection of Arkansas quartz crystals—in 1907. Then there is a lot about paleozoic rocks and such, and the author says:

"The Arkansas traveler, who passes through the west-central part of the state, finds many dealers of quartz crystals occupying roadside stands along U. S. Highways 70 and 270 and other highways near Hot Springs, Crystal Springs and Paron.

"The crystals on these stands have been mined at numerous places in the Crystal mountains and other localities in a belt of country 25 miles wide and 75 miles long, extending from Paron, near Lay, Winona, westward almost to Mena, near the Arkansas-Oklahoma line.

"Before DeSoto's exploration of this area and its settlement by white people, the quartz crystals were shaped into arrowheads by the Indians, but since then the crystals have been utilized in the manufacture of optical equipment and jewelry, including beads and ring sets. Stones that are cut from crystals are sold in Hot Springs under the trade name of 'Hot Springs Diamonds.'

"Most of the quartz crystals from Arkansas, however, find their way into the mineral collections of institutions and individuals, and a relatively large volume is utilized in the construction of water fountains and religious and memorial shrines. The value of the natural crystals sold in 1941 is estimated to be about \$12,000."

### He'll Keep at It.

He says the crystals also are suitable for radio oscillators. (That, of course, is why Arkansas crystals have suddenly become so important.)

Then there are more than 100 pages of statements like "The contact-metamorphic zone around the larger igneous rock bodies in generally less than a half-mile wide." And he gets around to the hobby again.

"The several geologic problems that have been discussed in the foregoing are trails along which I have been led by my hobby."

He said he did not intend now to "stop and dismount from my hobby."

"Instead, I intend to continue the collection of Arkansas quartz crystals as long as I am an Arkansas traveler and can obtain funds and credit for the purchase of quartz crystals from the dealers occupying the roadside stands in Western Arkansas."

## GEOLOGICAL SURVEY TO HELP DEVELOP STATE'S RICH QUARTZ DEPOSITS Arkansas Gazette 8-22-43

Rich rewards await enterprising owners of quartz-producing properties in Arkansas, the state Geological Survey announced yesterday as it prepared to help develop the only deposits suitable for intricate war machines in the nation.

H. E. Wheeler, the survey's mineralogist, said the state agency is prepared to help promote sales of quartz crystals and see that producers receive fair prices. The Metals Reserve Company, a government buying corporation, has established an office at Hot Springs to purchase all suitable crystals offered.

Quartz is sliced into blanks and wafers that must be accurate within one-millionth of an inch and used in all radio transmission. The blanks also are built into seismographs, which detect earthquakes, and instruments which "hear" the approach of enemy machines. They are used in the treatment of diseases when tissues must be stimulated by increasing the temperature of the bones. They are utilized in the separation of milk and in the determination of oils.

Large potential deposits of quartz have been found in Garland county, where development is being encouraged by the government and state survey. Prices range from \$1.95 to \$35.95 a pound, according to the percentage of usable crystal.

### Disappointed by Magazine.

Mr. Wheeler was disappointed when a national magazine published an article and pictures of Brazilian quartz, which until recently formed the only source of these valuable crystals, and failed to mention the fact that Arkansas is playing a significant part in the production of radio quartz.

"Brazil cannot supply the demand for quartz crystals of sufficient purity to meet the exacting tests of manufacturers," he said. "Crystals must be generally clear, although light smoky quartz can be used. You wouldn't believe it possible, but a multiple-sided piece of quartz weighing three pounds can be sliced from dozens of angles and yield as many as 342 wafers. Each blank is predetermined mathematically in order to meet exacting requirements.

"A finished crystal blank may vibrate 70,000,000 times a second. This oscillation, which must be constant for each blank or wafer, determines the dependability of radio transmission. It must be

## Geologist Sees B For Pick and Sh Will to Really D Democrat

WANTED: 50 pick and shovel laborers who have forgotten, or never learned to lean on a shovel handle, for hard work, which might easily pay returns that dwarf war plant wages.

With 50 such laborers, who are willing to devote even a few hours a day to hard work, State Geologist Joe Kimzey believes Arkansas could become an important producer of quartz crystals and make an important contribution to the war effort. He also is convinced that such labor not only would pay better than the average 69-cents-an-hour common labor scale, but that monthly returns of \$300 to \$400 would not be uncommon.

Most important to the state geologist, however, is the fact that the quartz crystals are urgently needed. Cut properly and ground to microscopically close dimensions, the crystals are the heart of every radio transmitter. And radio transmitters are necessary by the thousands in modern warfare.

The Arkansas quartz crystals are widely famous as "Hot Springs diamonds." However, like all true quartz crystals, they possess piezoelectric qualities, which cause them to vibrate when subjected to certain electrical currents.

Until recently, most radio crystals

adapted to temperature and interference factors. The vibrations are gauged by a sidereal clock and checked by the United States Naval Observatory to within one-one-hundredth of a second per day."

Mr. Wheeler predicted that future telephone communications will be controlled by quartz oscillator, so that 100 separate messages may be sent over a single wire simultaneously.

### Exhibit Set Up.

The Geological Survey has set up an exhibit of materials used in the preparation of crystal blanks, with photographs and diagrams of the processes, and samples of the wafers themselves. The exhibit, furnished by the War Production Board, the Crystal Products Company of Kansas City and Life

Magazine, is on display on the fourth floor of the capitol. Members of the survey staff will welcome visitors, Mr. Wheeler said.

## Quartz Crystals Search Expanded Democrat 5-31-43

Surveys on quartz crystal supplies in the state are being conducted in outlying districts from the territory being examined by the United States Geological Survey and Metal Reserves agency, State Geologist Joe Kimzey said today.

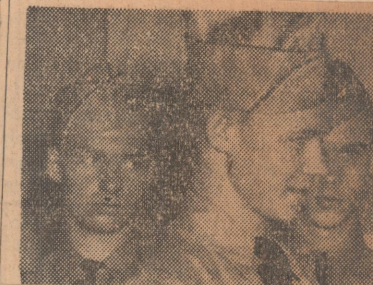
Search for the crystals, a critical war material, is being carried out in an arc from north Saline County, around Hot Springs, through parts of Montgomery, Yell, Garland and Polk counties, he said.

Mr. Kimzey reported that tests were now being run on nickel deposits found in Saline County during a survey there about two weeks. He said it would be a month before results could be determined.

J. C. Roehm, staff member of the Alaskan Territorial Bureau of Mines, is working with the State Department on a special assignment, Mr. Kimzey said.

## TO MINE ARKANSAS QUARTZ CRYSTALS Mining Record 12-30-44

Little Rock, Ark.—Joe W. Kimzey, Arkansas state geologist, announced late this year that two groups would begin mining quartz crystals near Lake Winona and Mt. Ida. These operations will be on a small scale at first but will be enlarged if found profitable. Metals Reserve Co. has opened an office in Hot Springs to purchase such crystals as are found.



properties equal to that of the Brazilian product, and in addition, is much more available.

Some quartz is now being dug out of the hills around Hot Springs, where the Metals Reserve Corporation has established a buying office. Since, like diamonds, the percentage of usable crystals is small, much greater production is needed.

In the opinion of the state geologist, 50 people working quartz veins with a pick and shovel could produce an average of 100 pounds of suitable crystals monthly.

Prices paid range from \$1.95 per pound for the smallest acceptable size, or one-inch crystal. Most of the quartz veins now located should produce enough larger crystals to bring the average price up to be-