EXTENSIVE BEDS OF PHOSPHATE IN STATE

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However, Geologists Find Product Is of Little Commercial Value.

The "phosphate horizon" of Arkansas is indicated by the dark crooked lines n the accompanying map, It is about 420 miles long and extends across the north central part of the state.

Well, what of it?

The average layman never heard of such a thing as a "phosphate harizon," nor ever suspected the state of having one. The term is used by by George C. Branner, state geologist, to describe the region which indicates, by its geological formation, that it contains beds of phosphate rock.

Phosphate rock is the backbone of fertilizer; fertilizer is the mainstay of agriculture, and agriculture is the principal industry of Arkansas. Wherefore, Mr. Branner thinks the "phosphate horizon" of the state is of potential economic importance and should be of interest to farmers and fertilizer manufacturers, at least.

Few farmers know anything about chemistry, botany and allied sciences, but they do know that their land becomes "poor" and needs to be enriched with certain elements that feed the crops and make them grow.

Principal Plant Foods.

The three principal plant foods are potassium, phosphorus and nitrogen, and crops can no more live without them than a human can live without groceries. When agriculture first began in Arkansas the soils had plenty of these plant foods, but successive crops have used them up and little has been returned to the soil.

Therefore the fertilizer industry means much to agriculture, and Arkansas' annual fertilizer bill is no small item. Farmers used approximately 122,742 tons of commercial fertilizer last year, and it costs them about $5,000,000. The annual increase is considerable.

Most of the fertilizer used in Arkansas is a commercial mixture, containing the three necessary elements poassium, phosphorus and nitrogen. The three elements usually are contained in potash, acid phosphate and nitrate of soda. The ratios vary from 12-4-4 to 10-1.65-2, but the bulk of the mixture always is the substance containing phosphorous.

Potach and Salts Imuorted.

Most of the potash and the nitrogen-bearing salts are imported, but the United States produces its own phosphate, the principal ingredient of commercial fertilizer. Florida, Tennessee and South Carolina produce most of the two or three million tons of phosphate rock sold in the United States each year for more than $10,000,000.

Plants cannot use phosphate rock in its raw state, even when crushed and screened, until the acids in the soil work upon it several years. Hence, it is made soluble and immediately available by treating it with sulfuric acid.

A great deal of the commercial fertilizer used in this state is mixed by Arkansas companies. The Arkansas Fertilizer Company of North Little Rock makes the acid phosphate from phosphate rock and sells it to the "dry mixing" plants.

Carloads of raw phosphate rock are imported into Arkansas to make the thousands of tons of fertilizer that are used annually. The Arkansas Fertilizer Company alone receives 25 to 50 carloads a month from Tennessee and a few carloads from Florida.

"Phosphate Horizon."

It has been going on for many years and all this time Arkansas has had a "phosphate horizon" 420 miles long. The known deposits of phosphate rock are indicated on the accompanying map by black dots, but even these have never been developed. A very crude estimate by the United States Geological Survey placed the available supply in Arkansas in 1915 at 20,000,000 tons. Mr. Branner is sure that it really is many times greater.

Only one attempt ever has been made to develop the known deposits. In 1900 the Arkansas Fertilizer Company established an acidulating plant near the beds at the mouth of Lafferty creek, in the western part of Independence county. After a few months the plant was destroyed by fire and it was decided to erect a new plant at Little Rock and ship the crude phosphate from the mines. The new plant was completed in 1906 but no rock has been shipped from any part of Arkansas and no other company ever has attempted to develop the deposits.

Why?

Two Reasons Advanced.

There are at least two reasons. One is advanced by chemists, who always have the final word in problems of fertilizer manufacture. Discouraging as it may sound, Dr. H. G. Lewis, chemist of the Arkansas Fertilizer Company, doesn't think so much of Arkansas phosphate rock.

He says that analysis of samples indicate that the rock is the known deposits is of inferior quality and not suitable for commercial use. It cannot be used economically, he said, because it has too much iron and aluminum in it.

Iron and aluminum are not injurious to crops, it seems, but when the raw phosphate rock contains more than five per cent of these elements it cannot be converted readily into acid phosphate. It seems that the iron and aluminum use up a great deal of sulfuric acid, which is expensive, but the principal objection is that they tend to make the acid phosphate sticky. More than five per cent of these objectionable elements causes the completed product to be a gooey mass, which cannot be dried for mixing and distributing.

The average amount of iron and aluminum in Arkansas phosphate rock is considerably more than five per cent, according to the analysis of a few samples from the known deposits, some of which contain as much as 20 or 25 per cent.

Lacks Phosphoric Acid.

Furthermore, Dr. Lewis said, Arkansas phosphate does not contain as much phosphoric acid as it should. To be commercially valuable, phosphate rock should contain at least 30 per cent phosphoric acid, and very little Arkansas rock has analyzed that much.

The other reason for the non-development of our phosphate is advanced by the state geologist. Mr. Branner contends that it is unfair to condemn the whole phosphate horizon because a few samples have not come up to standard requirements. As shown by the black dots on the map, the known deposits are in a very tiny area, when compared to the possible region.

There is no available data on the phosphate horizon, Mr. Branner said. It is at least possible that there are extensive beds of rock in Arkansas which would compare favorably with the rock of Tennessee, in quality and quantity. A geological survey of the region would make this information available, and Mr. Branner thinks it would be worth while, but the state Geological Survey has no funds and unless other interests contribute there is small chance that it will be made any time soon.

Only One Survey Made.

Only one survey of any importance ever has been made of the phosphate resources of the state. It was made in 1902 by the state geologist's father, Dr. J. C. Branner, whose description of the phosphate horizon was followed chiefly by Miss Pearle Lowe when she drafted the accompanying map.

Dr. Branner, aided by Dr. John F. Newsom, analyzed about 50 samples from the known deposits, and in his published report admitted "it is evident at a glance that in the majority of cases given, the iron and alumina contents are high for the manufacture of high grade fertilizers."

"We are far from believing, however," he wrote, "that these analyses condemn the phosphate rocks of north Arkansas. In the first place the whole area over which the phosphate beds occur or are to be expected, has not been examined, and it is not known, therefore, how much the materials vary in character and composition. Judging from what is already known, it seems reasonable to suppose that better deposits than any thus far found may yet be discovered."

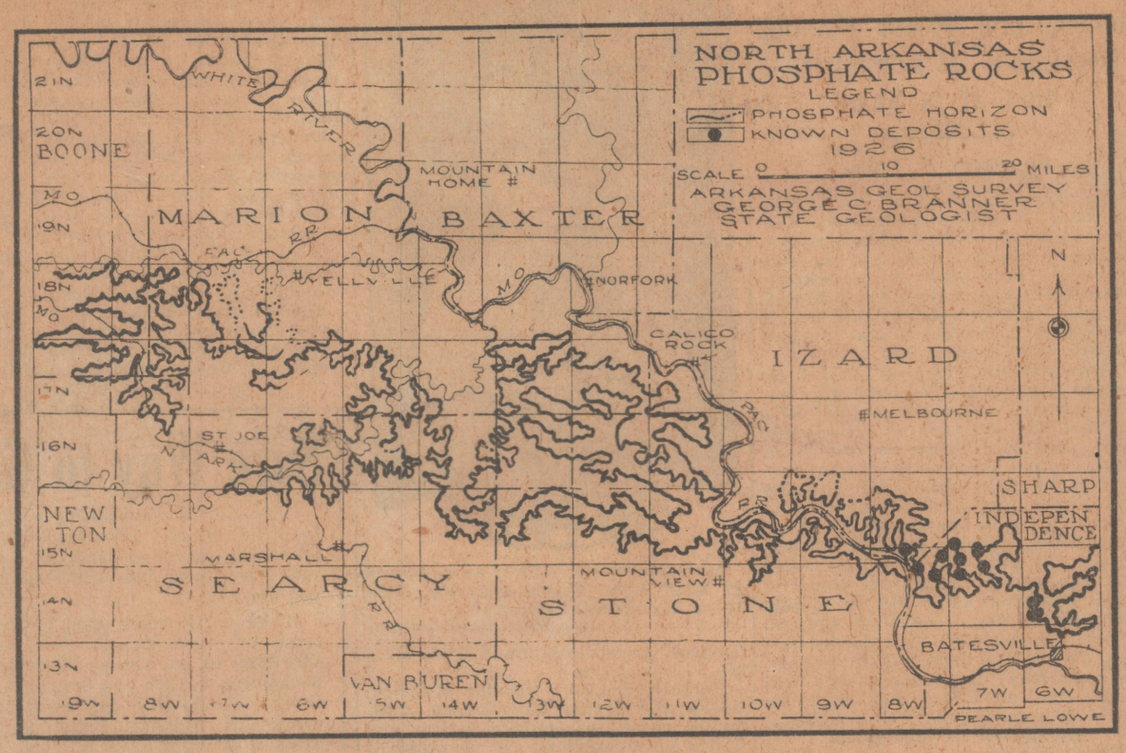
Dr. Branner stressed in his report that "all these rocks, even those running high in iron and alumina, may be used directly as fertilizers." Probably because raw phosphate is not available as plant food for several years, very little is used directly. The quantity of phosphate rock consumed raw by farmers for direct application to the soil is less than 100,000 tons annually, according to one authority.

Yet May Be Utilized.

Even if most of Arkansas' phosphate rock is of inferior quality, there is a possibility that it all may be utilized some day, according to chemists. Several years ago, two or three fertilizer companies conducted experiments with phosphate rock in an attempt to make it water-soluble without the use of sulphuric acid. One Florida company perfected a nonacid process known as the Kreiss process, in which an alkali flux was used. An Alabama company experimented with the electric-furnace process, and both companies apparently were successful. However, there has been very little mention of the nonacid processes in the past few years, and local chemists say probably were found to be too expensive.

Developments in the fertilizer industry are dependent upon the achievements of chemists, and Dr. Lewis believes it is entirely probable that Arkansas' phosphate rock will prove to be another valuable mineral asset to the state, within a few years.

Geologist's Map Showing Location of Huge Beds Of Phosphate in North Central Arkansas Counties



perhaps 40 feet in height. At its base and extending half way up the bluff is a deposit which appears like soft petrified fish. Break off a piece of it and it smells like a freshly opened can of sardines. It is oily.

Mr. Rumley discovered this deposit many years ago. He says that once he had some of it analyzed and that it is almost pure phosphate, such as is used in fertilizer. It has been his hope for years that some fertilizer company would come and exploit his bluff, and bring him a competence in his old age. Now his dream may be realized.

L. A. Watkins, vice president of the M. & A. railway, who was born and reared in these hills, has become interested in the task of searching out further their resources and developing them, not only to bring prosperity to his railroad but to his neighbors. He has become interested in Henry Rumley's bluff of petrified marine life and he made a trip to inspect it.

As soon as Mr. Watkins arrived at the bluff rain began to fall and continued all day. Explorations were difficult, but Mr. Watkins said that the upper portions of the bluff would yield as fine an agricultural lime as he had ever seen.

He took many samples away with him for assaying and will return shortly to explore the lower levels. Mr. Watkins states that some other deposits of almost pure phosphate have been found in Searcy county.

Clark County Phosphate Bed Attracting Geologists.

7-22-36

Special to the Gazette.

Arkadelphia, July 21.—A phosphate bed that underlies a large area in Terre Noir township, Clark county, is attracting attention of geologists representing Eastern capitalists. K. H. Holt, farmer in the Smyrna community, said the geologists indicated a move might be made to organize a mining company to open the phosphate beds that are 20 feet thick in places. The deposits crop out in several places on Holt's farm. The general area is two miles from the Norman branch of the Missouri Pacific railroad. Immense fossils found in the phosphate beds indicate that this was once a sea bed.

Phosphate Deposit of Aged Farmer May Yet Make Him Well-to-Do

Searcy

Democrat 5-30-37

St. Joe—Within a stone's throw of the Missouri & Arkansas railway tracks, and on the banks of a fork of the Red river near Rumley siding, five miles south of Leslie dwells Henry Rumley, now 80 years old. From him the siding and postoffice there were named.

On his farm, across the river from his dwelling house there is a bluff,