GEOLOGICAL SURVEY OF ALABAMA, BULLETIN NO. 2 ON THE PHOSPHATES AND MARLS OF ALABAMA

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BY

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PREFACE.

In the summer of 1883 the systematic examination of the Cretaceous and Tertiary formations of Alabama was taken up by the Geological Survey.

The first work was done in the vicinity of the Alabama and Tombigbee rivers by Mr. L. C. Johnson and myself, and later by Mr. D. W. Langdon and myself. The results of this study was a preliminary report on this region published as Bulletin No. 43, of the United States Geological Survey.

Since 1887 the examination has been carried eastward to the Chattahoochee river chiefly by Mr. Langdon, and a report upon the Cretaceous and Tertiary formations of the whole State is now in great part in manuscript and will be published as soon as the map, which is to illustrate it, can be made ready.

Enquiries are continually being made concerning the natural fertilizers of the State, and in view of the interest in these matters thus shown, it has been thought desirable to publish so much of the report above referred to as relates to the phosphates and marls of Alabama as a Bulletin in advance of the rest.

EUGENE A. SMITH.

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THE PHOSPHATES AND MARLS OF ALABAMA.

THE PHOSPHATES OF ALABAMA.

HISTORICAL.

In the early part of the spring of 1884 I received from Mr. J. W. Spencer, of Hamburg, Perry county, a box of phosphatic nodules and shell casts. Mr. Spencer's attention had been directed to these things which occurred on his land, by some published description of the South Carolina phosphates. He had sent specimens to Dr. C. U. Shepard, of Charleston, S. C., who had analyzed them, and, on recognizing them as phosphates, had sent his assistant, Dr. Chazal, to Alabama to investigate the occurrence. Dr. Chazal examined the ground and came to the conclusion that the phosphates were not in sufficient quantity to be of commercial value, and this conclusion seems to be borne out by our subsequent investigations, so far as the *high grade* phosphates are concerned, and these were all that Dr. Chazal particularly examined.

In April 1884, I went to Hamburg personally to see the mode of occurrence of the phosphates, and finding in addition to the nodular phosphates, a phosphatic greensand, and being satisfied that the latter at least, would become an article of great value to our agricultural interests, I announced the fact through the papers, and sent Mr. D. W. Langdon, Jr. Assistant in the State Geological Survey, to examine the occurrences about Hamburg more closely, and to follow the outcrop of these deposits from Hamburg east and west across the state.

Soon after my announcement, Prof. Stubbs of Auburn, and his Assistant, Prof. Leroy Broun, Jr., came also to Hamburg and the last named gentleman was with Mr. Langdon in his subsequent investigations about Hamburg.

Afterwards, Mr. Broun went into Macon, Russell, and Barbour counties, where he also found the phosphates.

Mr. Langdon traced the Hamburg deposits across to Eutaw, and eastward to near Selma. I sent Mr. John Daniel of this University down to Summerfield, and afterwards to east Dallas and western Autauga, and later still, into the southern part of Dallas county, where he collected for the survey some valuable notes of the occurrence in those localities.

Having indicated in the newspapers, several places at which I thought the phosphates likely to be found, I received, from persons all along this line of probable outcrop, specimens which in most cases proved to be phosphatic.

Thus in a very short time, it was known that the Hamburg belt of phosphates extended from the Mississippi line through Pickens, Greene, Hale, Dallas, Autauga, and Elmore counties, while Prof. Brown's examinations showed them to exist in Macon and Russell.

A systematic examination of the specimens in the collection of the Geological Survey in the cabinet of the University, soon revealed the fact that the limestones and other rocks of the Ripley group of the Cretaceous formation, immediately *overlying* the Rotten Limestone, were in places more or less phosphatic. This was announced in the newspapers, and a list published of the localities where the phosphates were likely to occur, and in a short time specimens were sent up to the University from many localities, showing that the phosphates were very generally present along this belt also across the entire state. Examinations were made by Mr. John Daniel, Mr. Langdon and myself of these deposits in Dallas, Wilcox, Marengo, and Sumter counties as to their mode of occurrence and the thickness of the beds.

During the summer of 1884 Mr. Langdon, while collecting for Mr. T. H. Aldrich in the southern part of the state, discovered that there were phosphatic materials occurring still further south and in the Tertiary formation, the previously discovered beds being in the Cretaceous.

In the spring and early summer 1884, many analyses of phosphates were made at the University of Alabama, and later in the summer I sent the specimens collected by me, either through my assistants or through correspondents, over to

Auburn where they were analyzed in the state laboratory of the A. & M. College under the supervision of Prof. Stubbs. The results of these analyses were published in Bulletin No. 5, of the Agricultural Department, with a joint report on the phosphates of Alabama, by Prof. Stubbs and myself.

The specimens analyzed were all contributed by the Geological Survey, except about twenty, which were furnished by Prof. Broun from the eastern counties of the State. The specimens from Hamburg analyzed at the State laboratory were collected by Messrs. Broun and Langdon. The arrangement of the material in this Bulletin No. 5 is such that it is very difficult to make any practical use of the analyses, and a reprint of the same will not be amiss.

Soon after the first announcement of the discovery of the phosphates, hopes of making sudden fortunes were raised in the minds of many of our citizens, but when after further investigation, it seemed improbable that high grade phosphates suitable for exportation would be found in Alabama in commercial quantity, there came a reaction and doubts have arisen as to whether our phosphates are worth anything at all. With the example of New Jersey before us, there should be no possibility of a doubt as to the future of agriculture in Alabama.

If we compare the two states, New Jersey and South Carolina, one of which has only low grade phosphates suitable for use at home but not rich enough for export, the other with high grade phosphates which are shipped to all parts of the world, we can hardly fail to see that the advantage to the state at large is in favor of New Jersey with its low grade marls. In South Carolina the phosphates are either exported or manufactured into high grade fertilizers from which, in all probability, the soils of that state derive no more benefit than the soils of other states. The marls of New Jersey on the other hand are used almost exclusively upon the soils of that state, and the result of twenty-five years application of them has been to cause the lands of New Jersey to be worth more per acre than those of any other state.

With an abundance of high grade phosphate only, in this