

XIII. JOHNS VALLEY BOULDERS

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Oklahoma geologists are scratching their heads these days and using their imaginations trying to find out how certain boulders, or erratic masses of limestone, were transported long ages ago from western Oklahoma into the eastern part of the state. These men have a number of theories regarding the matter, but no one can be absolutely sure that any one of these theories is correct.

For more than twenty years geologists have known about these erratic boulders. They occur scattered like plums in a pudding throughout a certain geological formation known as the Caney shale, which is exposed around the Arbuckle Mountains area and in a number of the southern and southeastern counties. The boulders are found chiefly in Atoka, Pushmataha, and LeFlore counties. Nearly a quarter of a century ago Mr. A. Taff, government geologist, and Dr. E. O. Ulrich, a paleontologist from Washington, found these boulders and described them in scientific journals. During the last few months interest has again been excited in the matter, and a number of the younger men have visited the various localities to study these rocks.

The following facts seem to be well established:

The Caney shale which is a formation usually 1,000 to 1,500 feet thick, is made up largely of shales, with thin edges of limestone and sandstones. It contains fossils of Mississippian and Pennsylvanian age. This shale is exposed in many places throughout the region mentioned.

Scattered around in the Caney shale are numerous boulders or masses of limestone and sandstone containing fossils which show that they usually belong to the Ordovician age, which is very much older geologically than the Caney. These boulders vary all the way from small pebbles, the size of marbles, up to and including great masses of limestone. The largest of these masses was recently measured and found to be 370 feet long, 65 feet wide and 20 feet thick. There are several of these boulders known to be more than a hundred feet in length.

The fossils found in the boulders show that they are of the same age as the rock exposed in the Arbuckle and Wichita Mountains and the Criner Hills. Fragments have been found of Arbuckle limestone, Simpson sandstone, Viola limestone, Hunton limestone, Woodford chert, and Sycamore limestone, which rocks make up the Arbuckle Mountains section.

So one might reason that the boulders came originally from the Arbuckle Mountains. This might be true if it were not for this additional fact, namely, at the time when the Caney shale was laid down in a prehistoric ocean, the Arbuckle Mountains had not yet been elevated, but the present site of the Arbuckle Mountains was an

open sea. To say it differently the Arbuckle Mountains were raised out of the ocean after the Caney shale had been deposited.

But geologists now believe that there were other ranges of mountains containing the same series of rocks as those exposed in the Arbuckle Mountains today, which were in existence at the time when the Caney shale was being deposited. One of these ranges of mountains is now represented by the Criner Hills, the Healdton-Loce buried folds, the Wichita Mountains and the buried Amarillo Mountains. Another such mountain range located southwest of parallel to the Criner-Wichita range, the presence of which is now being revealed by deep drilling, occurred along Red River in the vicinity of Grimesville, Texas, thence west past the Petrolia and Burkburnet oil fields.

Thus we have a possible source for the Ordovician boulders found in the Caney shale. The question then arises, how were they transported? What agency could have carried boulders weighing up to 50,000 tons a distance of fifty to 100 miles and dropped them in an open sea?

The only agency that the geologists have been able to think of is ice, either in the form of glaciers or in the form of icebergs. At the present time the men who are studying the problem have not decided definitely which method is most feasible. Most of the men seem to favor the iceberg theory. These men point out that in the fiords of Norway and Greenland today, great masses of ice come down these narrow valleys from an inland cap, are broken by the action of waves and tides, and are floated out into the Atlantic ocean forming icebergs. It was one of these icebergs that destroyed the steamer Titanic some years ago. It has been observed that occasionally these great masses of ice scraping against the side of the fiords, undercut the cliffs, and fragments of rocks tumble down and lodge on the icebergs, and in time are carried out to sea. As the iceberg melts these rocks slip off and sink to the bottom of the ocean, and find a final resting place in the mud and ooze on the ocean floor.

It would seem reasonable to assume that conditions of this kind may have happened in Oklahoma during the far-gone geologic age when the Caney shale was being laid down. We believe that at that time the Wichita-Criner Mountains, and possibly the Red River Mountains, stood at an elevation of several thousand feet above sea level and also above their present level. Glaciologists tell us that there have been many periods of glaciation throughout geologic times and that one of these glacial periods occurred at about the time when the Caney shale was deposited. Ocean currents from the southwest may have floated the icebergs carrying these limestone masses from the mountains where they originally belonged, and they were dropped where the iceberg melted.

So far as we know these limestone masses found in the Ouachita Mountains region are the largest transported masses of rock on the North American continent. There is, however, a rock mass in Sweden

which has been carried for many miles, which is larger than anything so far found in Oklahoma.

John's Valley is an inclosed, oval-shaped basin twenty-five miles north of Antlers. It is built like a big butter bowl, four miles long and three miles wide. The timber-covered mountain ridge forming the rim of the valley is made up of heavy, massive ledges of sandstone known as the Jackfork sandstone. This ledge dips inward in all directions from the encircling rim toward the center of the valley. In the interior of the basin lying above the Jackfork sandstone, is the Caney shale which contains the scattered boulders.

The road into John's valley is not a good automobile road. In fact, it is one of the worst automobile roads imaginable. It took two hours to drive 14 miles over the mountains from Kosoma. In the valley there are something like a dozen families, engaged for the most part in stock raising.

John's Valley was named from Amos John, a Choctaw Indian preacher who, in 1865, built a mission church in the valley, and who preached there for many years. The old church of hewed logs is still standing.

During the past summer a party of geologists visited some of the larger of these boulders in John's Valley in northern Pushmataha County. Some of these men who heard wild tales concerning these boulders, but who had never seen them, were very skeptical regarding their size. These same men, when they came out of the valley, were thoroughly converted, and all declared that conditions have not been exaggerated.