
The Doe Creek Sandstone¹

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This formation is exposed in a line of disconnected hills that extend southwest from about 15 miles west of Alva, Oklahoma to near Woodward; a distance of about 40 miles. Because of its texture, color, and elongated form, some geologists have suggested that it may be an extension of the Verden sandstone that is made up of a series of outcrops reaching from near Rush Springs, Oklahoma northwest to Calumet. However, the two differ in origin, age, and structure and on the suggestion of Hugh D. Miser of the United States Geological Survey, the writer made a study of the formation in company with R. L. Clifton of Enid, Oklahoma, formerly chief geologist of the Champlin Oil Co., and it was agreed that because of their physical relationships and fossil content, the Cleveland hills, the Whitehorse mounds, the Wildcat mounds, the Doe Creek mounds and the outcrop near Woodward should be included under the single name of the Doe Creek sandstone. The name has now been confirmed by the U.S.G.S. committee on geologic names and will appear on the new geologic map of Oklahoma.

Clifton, (1) following an account of the Whitehorse sandstone, has described the various outcrops now included in the Doe Creek sandstone in the following words:

"Some ten miles or more, in a direction southwest of the sandstone exposures at Whitehorse Springs, there occurs an imposing alignment of sandstone buttes and escarpments, rising more than 100 feet above the level of the surrounding plains. Locally, these buttes are known as the Wildcat mounds, so named from a small stream that receives the drainage from the west slope of the exposures. A hard, highly-cemented sandstone that caps the crests of the buttes is fossiliferous in many of its cross-bedded and regularly-bedded laminae. The thickness of the indurated beds is from six to thirty-five feet. The fauna that occurs at this locality is identical with that occurring at the type locality at Whitehorse Springs.

In Woodward county, across the Cimarron river from the Wildcat mounds, at an intervening distance of twelve miles, there occurs a series of sandstone exposures, whose escarpments and buttes may be traced for a distance of twenty miles. The trend of the exposures is southwest, agreeing in alignment with the buttes and escarpments at Wildcat mounds and at Whitehorse Springs. Rising above the level of the plain, to a height of more than 100 feet, these buttes, which for present purposes will be designated as the Doe creek mounds, are rich collecting grounds in parts of the sandstone that caps the tops of the buttes. The fauna of the Doe creek mounds is comparable with the faunas at the type locality.

¹The field work for this study was made possible through a grant from the Faculty Research Fund of the University of Oklahoma.

Six miles east of Woodward, Oklahoma, occurring along the south bank of the North Canadian river, there is a long exposure of sandstone, from whose beds a limited collection was made. At this place the sandstone is exposed along the river for a distance of more than a mile, the beds of which, for the more indurated layers, have a thickness ranging from a few feet to as much as 36 feet. The fossils collected from the sandstone are the counterparts of those occurring at other fossiliferous beds of the formation.

Seven miles north of Whitehorse springs and near the Kansas-Oklahoma boundary, there occurs a remarkable series of sandstone exposures, the buttes and escarpments of which rise more than 300 feet above the valley floors. At that locality there is an extensive area of deeply-dissected sandstone exposures whose topographic features consist of buttes, escarpments, mesas, or plateau-like hills. Locally, the area of the highest relief is known as the Cleveland hills. In some of the beds of the more indurated sandstone, which caps the crests of the escarpments and appears in section near the top of the highest hills, the fossils of a few species were collected. These species also occur at the type locality."

The Doe Creek sandstone and the Verden are both in the Whitehorse but the Doe Creek is the younger. There is a considerable unconformity at its base. In some places all of the Dog Creek and much of the Blaine has been eroded away. The Doe Creek is not a channel sandstone like the Verden. However, the exact method of its formation is not known. Possibly, a reasonable explanation is that its material was originally contained in a series of thick sand deposits lying along the shore of a Permian embayment or inland sea. With the sinking of the land and the consequent encroachment of the sea these were worked over, consolidated and buried under younger Paleozoic sediments.

LITERATURE CITED

1. CLIFTON, R. L. 1925. Areal extent and stratigraphy of the Whitehorse sandstone. Unpublished thesis, University of Oklahoma, Norman.
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