

A DRAINAGE CHANGE INVOLVING THE NORTH AND SOUTH CANADIAN RIVERS

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The drainage pattern of Oklahoma has attracted the attention of geologists for many years. The explanation of the peculiar parallel arrangement of its major streams has been listed among the unsolved problems of the geology of the state. This note is offered to suggest an explanation for one minor, temporary change in this complicated set-up.

The North and South Canadian Rivers approach within 7 mi. of each other in the vicinity of Wheatland, southwest of Oklahoma City. At this place there is a strip of low flattish country, extending from one stream to the other, approximately 6 mi. in width from east to west at its narrowest point. The elevation of this flattish surface is about 80 ft. above the North Canadian River at Newcastle, in the northern part of McClain County. At the Oklahoma City Air Port, midway between the two streams the surface is 10 ft. lower, aneroid reading. (The aneroid readings were not considered accurate enough to determine the direction and amount of slope if any, of this flattish surface, nor the relative elevations of the beds of the present streams.)

Thick black soil covers a large part of the area. Sometimes, below this soil, along gullies near the edge of the plain, are found residual red clays derived from the Hennessey shale and grading down into it. Upon examination, irregular areas were found in which the underlying material is quite different from the black soil and the residual clays. While the Hennessey shale breaks down into a bright red clay, the color of the material of these areas is grey; and while it resembles ordinary clay in appearance it is really an exceedingly tough gumbo, extremely hard when dry and creeping under pressure when wet. It constitutes a part of the surface material of this same plain on the campus of the University of Oklahoma and adds greatly to the engineering problem in establishing satisfactory footing for foundations of buildings. The gumbo is confined largely to the flat surface of the plain although I found one good exposure in a road-cut halfway along the east side of Sec. 3, T6N, R3W. At this point an 8 ft. section of grey gumbo is exposed, slightly above the level of the plain, resting on red Hennessey shale.

Along the Interurban tracks between Oklahoma City and Lake Overholser are many sand pits. These sand pits are in stratified river deposits which are found at the same general level as the surface of the plain under discussion. They are in proximity to the North Canadian River. Similar sands are found along the South Canadian, a good exposure occurring 2.5 mi. southwest of the west end of the South Canadian bridge, southwest of Norman. These sands are easily distinguished from the river sands along these streams, consisting of medium to coarse, angular sand grains.

The findings indicate that the flattish land is a part of the high terraces found along the North and South Canadian Rivers in the central part of the state, and that at this place there was a mingling of the waters of the two rivers. The residual red clays near the edge of this area immediately below the black soil suggests that there was not much deposition at that point. The origin of the gumbo is not clear. It may be due to the end products of weathering and leaching in the slack water near the edge of the plain.

Against this idea of weathering and leaching is the fact that there is no stratification such as one would expect to find in slack water deposits

and the fact that the gumbo now contains calcareous nodules. The latter, however, are apparently of recent origin.

The age of this surface is suggested to be Pleistocene on the basis of elephant remains found in the terrace deposit 2.5 mi. southwest of the Norman bridge.

