

GEOLOGY

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XXXII. EVIDENCE OF GLACIATION IN THE ARBUCKLE REGION (1)

Samuel Weidman

From the Oklahoma Geological Survey and the Department of Geology of the University of Oklahoma.

The deposits that are believed to have been formed either directly or indirectly, because of glacial conditions during Pennsylvanian-Permian time include what has been referred to as the Franks Conglomerate and other conglomerates of the same type.

The Franks Conglomerate at Franks, the type locality, located on the northeastern slope of the Arbuckle Mountains, consists of several distinct beds of conglomerate each 100 to 350 feet in thickness, interstratified with limestone, shale and sandstone.

The lowest conglomerate bed at Franks, about 150 feet in thickness, is at the base of the Pennsylvanian of the locality and unconformably overlies the eroded edges of the pre-Pennsylvanian formations. The beds of higher horizons, 100 to 350 feet in thickness, are conformable with associated limestone and shale beds and have the characteristics of intra-formational conglomerates within the Pennsylvanian. The Franks conglomerate, therefore really forms a series of conglomerate beds reaching from the base up to higher horizons of the Pennsylvanian and probably into the basal Permian.

Whatever the correlation of these conglomerates, however, it is their character and their probable origin to which attention is

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called. The glacial origin of the conglomerates is believed to be indicated by the following characteristics:

1. The heterogeneous character of the conglomerates, as indicated by the range in source of rock material and the great variation in size of the constituents in local deposits.
2. The non-residuary and unweathered character of the constituents of the conglomerates.
3. The great thickness of the conglomerate beds.
4. The occurrence of polished and striated surfaces of the rock floor upon which the conglomerate rests.
5. The occurrence of polished, striated, and grooved pebbles and boulders in the conglomerate.
6. The occurrence of boulders in the conglomerate transported in a direction conforming to the direction of striae on the rock floor of the conglomerate.

The phenomena described under the first three of these headings refers to characteristics which are general and everywhere exhibited by the conglomerate, while the features described under the latter three headings which are the distinctive evidence of glaciation, are not everywhere developed or preserved in the conglomerate.

In addition to the distinctive evidence of glacial origin furnished by the constituents of the conglomerate and the striated rock floors, there are U-shaped valleys of the Arbuckle Mountains formed before and during the period of deposition of the conglomerate which possesses the characteristic outlines of glacial eroded valleys. One of these U-shaped valleys, that of Honey Creek, has a polished and striated rock floor upon which the typical glacial conglomerate rests.