ABSTRACT OF

LITHOLOGIC VARIATIONS IN THE DEVIL'S KITCHEN MEMBER OF THE "DEESE" FORMATION IN THE ARDMORE BASIN

By David Waldron Schacht *

The Devil's Kitchen member is lower Des Moinesian in age. The fossils contained correlate with Boggy[1] shale (lower Cherokee) north of the Arbuckle Mountains and with the Millsap formation[2] in North-Central Texas.

Three distinct phases of sedimentation are represented in the three larger units of the Devil's Kitchen member: the first, during which predominantly sands and occasionally silts and clays were deposited at this locality; the second, when large quantities of shale were deposited; and finally, deposition of alternate sands and chert conglomerates.

The mud cracked surfaces and the variation in color at different horizons within the shales indicate that during this interval these deposits were periodically elevated above sea level and thoroughly aerated. Influx of coarser material at times is evidenced by lenses of sandstone. A change of environmental conditions occurred with the deposition of the top unit. The extremely cross-bedded sandstone affords mute testimony to this when contrasted with the shale and limestone immediately below at the spillway and shale quarry. The contact is everywhere sharp, though at certain localities it is between sandstone and limestone without the intervening shale. Chert conglomerate and ripple marks become more common upward in the section; each of the three larger units of chert contains pebbles of a distinctive color.

The increasing coarseness of the conglomerate to the southeast and the absence of limestone fragments suggest a source in the Ouachita region. Because of the stratigraphic relation, the similarity of colors, and the associations of heavy minerals, the writer believes the Arkansas novaculite to be the provenance of the Devil's Kitchen conglomerate.

Deeper water to the northwest is indicated by thickening in this direction of the limestone bed in the upper portion of the shales, and by less frequent near-shore features. The mineralogy, stratigraphy, absence of limestone fragments in the conglomerate, and the increasing coarseness of the chert to the southeast also suggest a source in the Ouachita facies, at least for the conglomerate phase.

Extensive ripplemarks, cross-bedding, and mud cracks near the southern end of the outcrop in Love County are evidence of a nearby land area, which probably was of little relief, during much of the interval of deposition of the Devil's Kitchen member.

[1] Charles N. Gould, "Index to the Stratigraphy of Oklahoma", *Oklahoma Geol. Survey Bull.* 35, (1955), p. 42.

[2] Frederick B. Plummer and Raymond C. Moore, "Stratigraphy of Pennsylvanian Formations in North Central Texas", *Univ. Texas Bull.* 2132, (1921), p. 73.

* Presently with GEOPHOTO, Denver, Colorado; written in partial fulfillment of the requirements for the degree of Master of Science from the Graduate College, University of Oklahoma, 1947.