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SIGNIFICANCE OF THE GRAPTOLITES
OF OKLAHOMA

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While it is realized that the complete significance of the graptolites of Oklahoma cannot be appreciated until they all shall have been worked

out, it is believed that as a result of the recent brief studies something of their importance has already been shown and that a suggestion of their ultimate significance has been given.

For thirty years or more graptolites have been recognized as an important element in several of the faunas of Oklahoma, but until recently no careful detailed study of them has been attempted. In the earlier publications a few have been listed, but specific determinations are in several cases followed by a question mark and others have been given only generic determinations. (1)

In the Arbuckle Mountains graptolites have been recognized from five or six formations, namely: the Arbuckle limestone, Joins and Bromide formations of the Simpson group, the Viola limestone proper, the Fernvale phase which until recently has been classed with the Viola, but which has been recognized as a separate formation eastward in southeast Missouri and in Kentucky and Tennessee; and in the Sylvan shale.

Eastward along the fault east of Atoka (2) they have been recognized in the Stringtown shale and Sylvan shale and in the northeast extension of the outcrop of the Stringtown shale at Stringtown. Also this shale outcrops about 65 miles to the northeast in the Potato Hill region west of Albion in southern Latimer and northern Pushmataha counties. (3)

The Womble shales carry graptolites in Arkansas (4), but none have been found in them in Oklahoma.

Poorly preserved graptolites have been found in the Polk Creek shale, but they have been considered unidentifiable. (5)

Graptolites have been found in the Blaylock sandstone of Arkansas, but as yet none have been found in this formation in Oklahoma. (6)

In the Arbuckle limestone two graptolites have been found loose in the quarry at Crusher, so that their exact horizon is not known. One of these, *Tetragraptus rectinatus*, has been described by Elles and Wood from the Ordovician of England. Several fragments of graptolites have been found by the writer near the top of the Arbuckle limestone in the east central part of the Criner Hills of Oklahoma, but they have not been identified.

Didymograptus artus occurs in a very narrow zone near the base of the Joins formation of the Simpson group at many localities in the Arbuckle Mountains (7). This form has become of great importance in the Oklahoma City oil field, as it has been found in the cores from a number of wells, thus demonstrating the presence of the Joins formation which had been thought by some to be absent from that field. *D. artus* commonly elsewhere accompanies *D. bifidus* which occurs widespread in Newfoundland, Scotland, Wales, France, Bohemia, and Australia (8).

In the upper part of the Bromide formation at Rock Crossing in the Criner Hills and along Sycamore Creek 15 miles southwest of Sulphur a new species of *Diplograptus* has been found which, when described, will be named in honor of Ross Maxwell.

In the earlier publications only two graptolites were listed from the Viola and these were from the middle part of the formation. More careful collecting from numerous sections of the formation has revealed that they are widely distributed and extend practically from bottom to top of a 950 foot section, and that in all the thicker sections a very fossiliferous graptolite zone occurs about 100 to 150 feet above the base of the formation. In some of the thinner sections there is evidence that the basal part of the formation up to this zone either was not deposited or was eroded before the deposition of the superjacent part. Locally chert pebbles in a basal conglomerate seem to point to the latter of the two alternatives.

The paper now in preparation on the graptolites of the Viola limestone is to embody the results of two months of study with Dr. Ruedemann in the New York State Museum at Albany under a grant of the National

Research Council. This grant was made to pay expenses of completing field work and preparation of material and for travel and transportation of the large collection to Albany.

In this study twenty-nine separate varieties of graptolites have been identified from the Viola, one of them being a new species which will be described. Many of these occur in the Ordovician formations of eastern New York and several occur in similar horizons in Great Britain.

Not only are the graptolites distributed throughout the Viola proper, but some are found also in the Fernvale at the top.

Four species have been recognized in the Sylvan shale and by means of these the Sylvan has been definitely traced into the region east of Atoka where it was not heretofore recognized. John Fitts collected the graptolites which gave the clue to this new locality for the Sylvan shale. The tracing of this formation eastward by means of its graptolite fauna seems to form an opening wedge in the knotty problems of correlating the formations of the Arbuckle Mountains with those of the Ouachita Mountains to the east.

The Stringtown shale of the Ouachita region carries a varied graptolite fauna a few of which have been identified, but the fauna merits a thorough detailed study.

In their extensions into Arkansas the Womble shale and Blaylock sandstone carry important graptolite faunas, so that eventually the information that the graptolites can give should be assembled from the entire Ouachita Mountain region and comparisons made with the Arbuckle Mountain faunas.

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