ARBUCKLE FORMATIONS IN THE OUACHITA MOUNTAIN REGION

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A general idea seems to have arisen that Paleozoic formations in the Arbuckle and the Ouachita regions are entirely different. Though they are separated geographically by only a few miles, a barrier between them has been postulated to the extent that each of the two regions formed a separate site of deposition.

One reason for these conceptions probably is the fact that each region has been studied separately without much of an attempt to correlate the formations of the two regions except in the Upper Ordovician. Then, too, the formations in the Ouachita region of Arkansas are highly metamorphosed and in certain formations a considerable amount of this metamorphism carries over into the Oklahoma end of the Ouachitas.

In addition, the Paleozoic formations were studied earlier and in greater detail in Arkansas, and later the geological studies were extended westward into Oklahoma. Accordingly, the formation names adopted in Arkansas were applied to their westward extensions in Oklahoma.

In the Arbuckle Mountains most of the lower Paleozoic formations have been assembled in three groups: the Timbered Hills group, including Reagan Sandstone and Honey Creek (Cap Mountain); the Arbuckle group, divided into eight formations which are subdivisions of the former Arbuckle limestone; and the Simpson group, divided into five formations. Above these, three formations—the Viola, the Fernvale, and the Sylvan—have not been placed in any group. Accordingly, it is proposed to place this limestone-shale series of formations in a new group to be called the "Patterson Ranch Group" (See table I). This group name is taken from the Patterson Ranch on the south edge of the Arbuckle Mountains on the east side of U. S. Highway 77. On this ranch the Viola, Fernvale, and Sylvan formations are characteristically developed and they extend from the highway eastward across it.

When Frederickson's plan to restrict the Arbuckle group to the Ordovician is completed, all the formations of the Ordovician in this region will be included in three groups: Arbuckle, Simpson, and Patterson Ranch.

From the Ouachita Cambrian and Lower Ordovician formations little information has been secured by which they can be correlated with the Arbuckle formations, except that in Arkansas (Miser 1929) extensive graptolite faunas have been secured from both the Blakely sandstone and the Mazarn shale which place them definitely in the Lower Ordovician equivalent to the Beekmantown of New York and the Levis shale of Quebec, Canada. This zone seems to correlate with the West Spring Creek, the uppermost formation of the Arbuckle group in which *Phillograptus anna*, a *Tetragraptus*, and several extensiform *Didymograpti* occur.

Higher up in the section in the Stringtown and Womble of the Ouachita region, 18 species of graptolites have been found which also occur in the lower part of the Viola in the Arbuckle region. However, several species

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TABLE I

Lower Paleozoic formations of Arbuckle and Ouachita regions, Oklahoma

Silurian		Henryhouse Chimney Hill	Missouri Mt. Slate Blaylock Sandstone
Ordovician	Patterson - Ranch Group	Sylvan Shale Fernvale Viola	Sylvan-Polk Creek Big Fork Chert Stringtown-Womble
	Simpson Group	Bromide Tulip Creek McLish Oil Creek Joins	
	Arbuckle Group	West Spring Creek Kindblade Cool Creek McKenzie Hill 1.____ 2.____	Blakely Ss. Mazarn Sh.
Upper Cambrian	Arbuckle Group	Butterly Signal Mt. Royer Fort Sill	Crystal Mt. Ss.
	Timbered Hills Group	Honey Creek (Cap Mt.) Reagan Fm.	Collier Shale
		Pre-Cambrian Igneous	Not exposed

found in either the lower part of the Viola or the upper part of the Simpson; thus an erosional hiatus is placed between these latter two formations to represent the period of deposition for the lower part of the Stringtown and Womble.

In the Big Fork Chert several distinctive graptolite zones are found which correlate definitely with similar zones in the Viola limestone, and *Cryptolithus tesselatus*, so characteristic of the Viola, was found by John Fitts in the upper part of the Stringtown quarry. Even in the highly metamorphosed section of the Big Fork Chert at Grant's Gap northeast of Stringtown, graptolites are preserved in a number of zones and these graptolites are like those found in a number of corresponding zones in the Viola limestone. Also, some of the very cherty zones in the Viola are much like parts of the Big Fork chert.

The Fernvale has not been recognized in the Ouachita region, though it does occur in northern Arkansas, eastern Missouri, and west-central Tennessee.

The uppermost Ordovician formations, the Sylvan and the Polk Creek, doubtless form the strongest connecting links in the chain of evidence between the Arbuckle and the Ouachita Mountains Not only are the graptolites characteristic of the Sylvan found in the Polk Creek, but many of the physical characteristics of the Sylvan in the Arbuckle Mountains are found in the middle and upper parts of the Polk Creek in the Oklahoma Ouachita region.

Interesting corroborating evidence was found not long ago by H. D. Miser and associates in Johns Valley, where so much interest has centered because of the erratic boulders in the shale. They found a new outcrop of relatively large boulders of dark brown well-indurated shale. This shale contains three species of graptolites characteristic of the Sylvan shale. Also, it has physical characteristics similar to those of the lower part of the Sylvan at a number of localities in the Arbuckle Mountains, and particularly like those of the Sylvan at the south end of Scott's Dome seven miles southeast of Davis, Oklahoma.

The Silurian formations dovetail in such a way that there seems to be little evidence at present that there are synchronous Silurian deposits in the two regions.

LITERATURE CITED

Miser, H. D. 1929. U. S. G. S. Bull. 808: 27-31.