A Study of the Mineralogy and Texture of the Hot Springs Sandstone

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The Ouachita Mountains contain two major categories of rock formations: pre-orogenic and syn-orogenic. This study focuses on the Hot Springs Sandstone, which is separated from the Arkansas Novaculite by an unconformity that marks the initiation of the Ouachita orogenic event during the Mississippian. This caused the sediment within the area to go from highly biogenous to highly lithogenous. An exposure of the Arkansas Novaculite and the Hot Springs Sandstone was found behind the old Desoto hotel in downtown Hot Springs, Arkansas. In this outcrop, a 2 m thick sequence of sandstone, shale, and conglomerate was observed . A petrographic study was conducted on three samples from the outcrop. The first layer within the outcrop is a finely-laminated sandstone that was classified as a lithic wacke due to the presence of phyllite and chert clasts in a fine grained matrix. The clasts in the dark laminations included ilmenite and corundum, which were likely separated within a distal turbidite. The second layer is a finer-grained lithic wacke similar to the fine-lamination sandstone but with a muddier matrix and liesegang banding. The next layer is a thin shale, and the final layer is an intraformational conglomerate with clasts of phyllite and chert in recrystallized quartz matrix. The first three layers are interpreted as a single turbidite sequence spanning Bouma units b-e, followed by a debris flow that brought the sediment to form the intraformational conglomerate layer. After these layers were deposited, they were later slightly metamorphosed by the Ouachita mountain-building event.

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