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HEMATITE IN THE REAGAN SANDSTONE ALONG THE NORTHEAST EDGE OF THE WICHITA MOUNTAINS AND IN THE ARBUCKLE MOUNTAINS

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The findings of this paper are based upon general observations made at many places along the exposures of Reagan sandstone in both the Arbuckle and Wichita Mountains. Detailed study was made at the following locations:

(1). Four miles southwest of Alden, T6N, R14W. (Around an old mine or prospect hole).

(2). Five miles northeast of Meers, T4N, R12-13W. (In the neighborhood of Paint Rock Mine).

(3). Ten miles west by southwest from Davis, T1S, R1W. (In small gullies near the foot of West Timbered Hills).

(4). Seven miles south of Davis, T2S, R1E, (in small gullies on the southwest end of Timbered Hills).

(5). Five miles northwest of Ravia, T3S, R4E.

The following may be given as a generalized section of the Reagan formation: The lower few feet of conglomerate, ranges from fine pudding

stone to coarse conglomerate. In the Wichitas the individual pieces are as a rule well rounded, while in the Arbuckle mountains they often do not show much rounding. Above the conglomerate the formation is made up largely of sandstone which varies in texture from fine well rounded quartz sand to coarse sand sometimes cemented into quartzite. Other members are poorly cemented and erode quickly so that good exposures are found only where cutting down is going on rapidly. There are a few layers of clayey shale.

The entire Reagan is highly colored on weathered exposures by iron oxide producing various shades of red, brown, and yellow. In some places the rocks are almost black due to manganese oxide. However, where the cutting down process outstrips the weathering, the rocks often have a dark green color due to the presence of glauconite (Hy K Fe sil.). $K\,Fe\,(SiO_3)_3 + nH_2O$.

In all cases studied the rocks are inclined at high angles ranging from 25° to nearly 90°. At the location (2) T4N, R12-13W a considerable body of iron ore (Fe_2O_3) occurs in the Reagan about forty feet above its base. The rocks at this point dip at an average angle of 30° to the northeast with a width of ore body of twenty-one feet. The ore is exposed for a distance of at least a mile in a general northwest-southeast direction. The ore body is nine feet thick three-fourths of a mile southeast of the principal mine shaft. In attempting to explain the origin of this ore body the following points have been considered:

(1). The ore body lies in the Reagan between layers of undisturbed quartzitic sandstone.
(2). The deposit is composed chiefly of silica and hematite running higher in silica than in hematite.
(3). The quartzitic sandstones of the entire formation are rather porous at the surface.
(4). Glauconite is abundant in the unweathered rock being collected, without difficulty, at all the locations mentioned above.
(5). Iron oxides are also abundant and were collected as impure specimens in all the above locations.
(6). Glauconite and iron oxides are intimately associated but where Glauconite is most abundant, the iron oxide is less conspicuous and vice versa.

The evidence points to the conclusion that upon the breaking down of the glauconite, (HyKFeSil), the potassium and part of the silica was carried away in solution. Part of the remaining silica was used in cementing the quartzitic sandstone. The iron was united with the oxygen to form hematite, (Fe_2O_3). In the case of the ore body under consideration, the original glauconite at this point was purer or iron leached from other parts of the formation was added. That the latter may have been the case is strongly suggested by the porous condition of the adjacent quartzitic sandstone.

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