(147)
ITEM 149

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July 29, 1975

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Subject: Exhalite gold deposit proposal by Donald J. Decker.

On July 12, 1975 at your request I conferred with Mr. Donald J. Decker, a consulting geologist from Winnemucca, Nevada regarding his Exhalite gold deposit proposal. We talked about his concept of formation of what he is calling Exhalite gold deposition and visited his target area 4.

Mr. Decker believes that he has found gold bearing conglomerates that are composed of fragments that were mineralized before the formation of the conglomerate. They are fragments that were derived from the errosion of a now unknown mineralized area. The mineralization he is seaking is pre-conglomerate and he would search for the source of these conglomerates. He proposes to study the mode of deposition of these conglomerates and hopes to trace the mineralized fragments back to the source deposit from which they were derived.

The basis for Mr. Decker believing that this is pre-conglomerate mineralization stems, at least in part, from petrographic work done by Mr. Wayne R. Kemp, whose PETROGRAPHIC DESCRIPTIONS #438 & #440 are included as a part of Decker's proposal of June 6, 1975, to Mr. Bell.

Wayne writes, "The presence of ankeritic carbonate as vein and cementing material as well as the abundance of pyrite(iron oxides) and jarositic material is permissive of a carbonate-sulfide facies of "iron formation" developed in association with volcanism--------The ankeritic carbonate in samples 438 and 440 could be either syngenetic or diagenetic in nature. There is no clear cut evidence in thin section to suggest a late, epigenetic source for the iron.----- The gold was originally syngentic (not placer) or diagenetic."

Mr. Decker's target area 4 is at the Marigold mine, 5 miles south of Valmey, Nevada on the northwest side of the Battle

Mountain range in the NE$\frac{1}{4}$ sec. 18, T.33N.,R.43E. The mineralization at the Marigold mine has, up until now, been considered to be epithermal, possibly of the Carlin type. I believe that some exploration for Carlin type gold has been done in this area; however I doubt if it was very extensive. Attached to this short report are excerpts from USGS Professional Palers 495 A and 495B as well as a portion of an open file map made by Ralph Roberts in 1965, these contain data on the Marigold mine and the Golconda fault.

Conclusion:

Mr. Decker's theory as to the source of the gold bearing conglomerate, found at his target area 4, is one that I, previously, have not known of as being considered for ore deposits in this part of Nevada.

If the age of this mineralization can be dated, as Mr. Decker would more than likely have done had he had the available finances, it should be relatively easy to prove or disaprove his theory.

Regardless of the time of the gold mineralization, pre or post conglomerate, the conglomerates may be favorable areas for exploration.

If a proper consulting arrangement can be made with Mr. Decker, and since he appears to have no property position at the present time,it might be well to have him spend some time working on his Exhalative gold deposit proposal. Also, Mr. Decker apparently has other equivalent targets in mind, besides his target 4, and some of them may be worth considering for exploration, even if his theory proves to be wrong.

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P.P. 459 A

in the widening. Near the head of Trenton Canyon, a reverse fault with a steep westward dip, possibly a continuation of the Rocky Canyon reverse fault, repeats the Battle Formation, narrowing the outcrop.

A number of northwestward- and northeastward-striking faults of small displacement cut the western limb, but aside from small displacements of contacts, they do not seem to have any great significance.

In Copper Basin on the eastern limb of the anticline, four sets of faults have been mapped. The oldest set strikes east-west; younger sets strike north-south, northeast, and northwest. Some faults belonging to the east-west set dip at a low angle and may be thrust faults related to the Dewitt fault. The Sweet Marie fault is one of these, and others were mapped in the Contention mine and north of Elephant Head. None of the north-striking faults mapped has any great continuity, although one that separates the Harmony and Battle Formations west of the Elvira adit was traced for more than a mile, and it may connect with faults north of the Carissa mine that extend to the Sweet Marie mine.

The northeasterly fault set is cut by the northwesterly set, which appears to have smaller displacements on the whole and to be less continuous. The principal northwest fault has been traced from Willow Creek across the head of Rocky Canyon and down into Timber Canyon. This fault drops the Mill Canyon Member against the Pumpernickel Formation, requiring a minimum dip-slip displacement of 3,000 feet.

The youngest faults, the range-front faults, cut the Golconda block, but as they are not particularly related to the structures within the block, they will be described separately.

GOLCONDA BLOCK

The Golconda thrust fault, which forms the sole of the Golconda plate, has been mapped, with interruptions, through Battle Mountain, Edna Mountain, and the Sonoma Range. The plate appears to be a southward-plunging synclinal block about 25 miles wide; it is known to extend 60 miles south to Augusta Mountain, and it may extend 25 miles farther south into the New Pass Range.

The Golconda block is made up of folded strata of the Pumpernickel and Havallah Formations which are in part correlative with the units of the Antler sequence, but which were deposited in western Nevada and were thrust into this area in Late Permian or Mesozoic time. Thrusting in Late Permian seems more likely because Triassic strata involved considered (Silberling and Roberts, 1962) to be parautochthonous appear to be little disturbed; contrariwise, both the Pumpernickel and Havallah Formations in the Golconda block have been folded and sheared along faults.

The Golconda block covers the western flank of Battle Mountain (pls. 6 and 7). In the southern part it is as much as 7 miles wide, and it narrows northward to less than 2 miles at the Marigold mine. The block is bounded on the east by the Golconda sole thrust; in the southern half of the range it has been downfaulted. From south to north, the Golconda block is successively in contact with the Dewitt block, the Antler autochthonous sequence, and the Valmy block; near the Marigold mine the Antler sequence is again present (fig. 37). The Golconda block is structurally discordant with all the other blocks, for it has been involved in orogenic movements outside the area. It was the

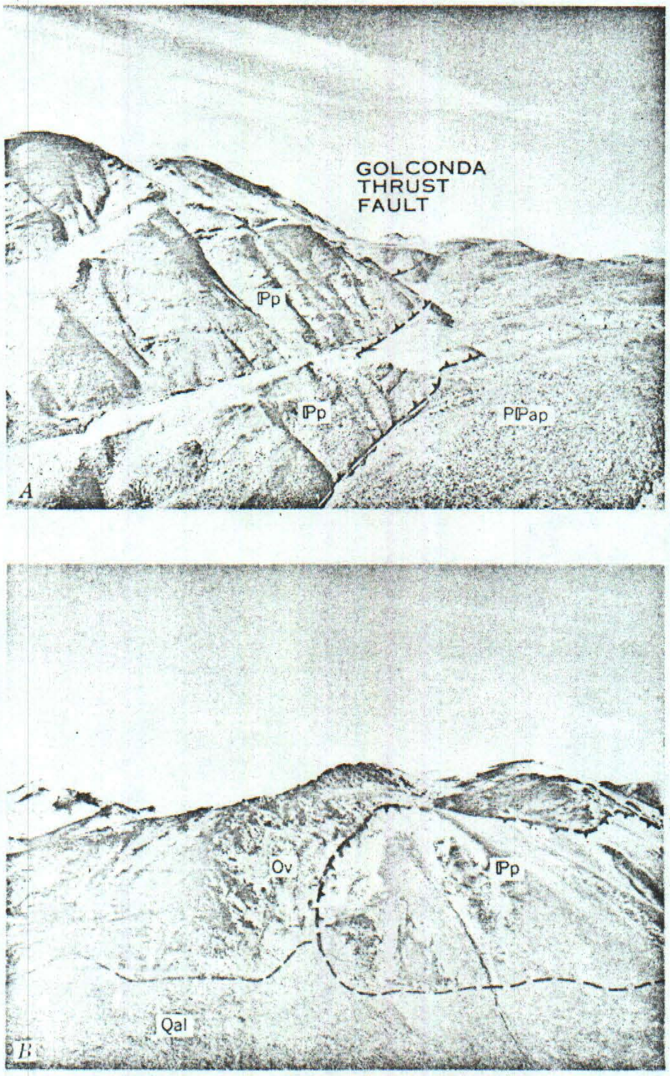


FIGURE 37.—*A*, aerial view north up Willow Creek showing trace of Golconda thrust fault. Upper plate is Pumpernickel Formation (Pp) and lower plate is Antler Peak Limestone (PPap). *B*, aerial view south from the western front of Battle Mountain showing the trace of the Golconda thrust fault. The lower plate is chert and quartzite of the Valmy Formation (Ov) and the upper plate is shale of the Pumpernickel Formation (Pp).

last major block to be transported into the Battle Mountain structural complex.

The structural features of the Golconda block have been mapped in more detail than those of the Valmy, Scott Canyon, and Dewitt blocks because it has been possible to subdivide the predominant formation in the block, the Havallah, into three members, the Jory, Trenton Canyon, and Mill Canyon, and map them throughout the block. This has assisted in bringing out the structural features and aided in their interpretation.

The Golconda thrust fault strikes N. 20°–40° W. throughout most of the quadrangle and dips 25°–60° SW. where measurements can be made (fig. 37). The best accessible exposure of the thrust plane is along the road about 150 feet north of the Nevada mine shaft. Here the lower plate rock is quartzitic conglomerate of the Edna Mountain Formation in which are preserved grooves that pitch 30° W. The broken zone along the thrust fault can be seen at many places; commonly, rock in the upper plate is highly fractured throughout a zone from a few feet to 30 feet thick. The lower plate is generally less fractured, but locally has widely spaced shears that are presumably related to thrusting. Fragments of broken rock derived from formations other than those in direct contact along the thrust may be seen locally. For example, fragments of Antler Peak Limestone and conglomerate of the Battle Formation may be found along the ridge about a mile southwest of the Oyarbide Ranch. These formations are probably present at depth in the lower plate of the thrust.

Folds.—The folds in the Golconda block are north-striking anticlines and synclines. Some of these folds are broad, open symmetrical folds, but most are asymmetrical and some of them are overturned.

The major fold appears to be a broad syncline whose axis strikes northward and northwestward and plunges gently southward. The syncline is best shown in Trenton Canyon and is therefore called the Trenton Canyon syncline. To the north, between Trenton and Mill Canyons, the axis of the syncline strikes about S. 30°–40° E.; south of Mill Canyon it swings into a southward trend which apparently continues to Timber Canyon, then turns to S. 10°–15° W. to the alluvial contact in Rocky Canyon. Much of the western limb of the syncline has been cut out along a reverse fault and is clearly observable only near the head of Mill Canyon. The eastern limb, on the other hand, has been repeated by reverse faults so that it can be seen on the ridge west of Willow Creek and at the head of Mill Canyon.

The anticline that flanks the Trenton Canyon syncline on the west is exposed in Timber Canyon, after which it is named. The northward extension of the anticline has been obscured by range-front faulting, but its general form is indicated on the north side of Timber Canyon by the contact between the middle and upper members of the Havallah Formation. The eastern limb of the anticline is likewise partly cut out on the reverse fault.

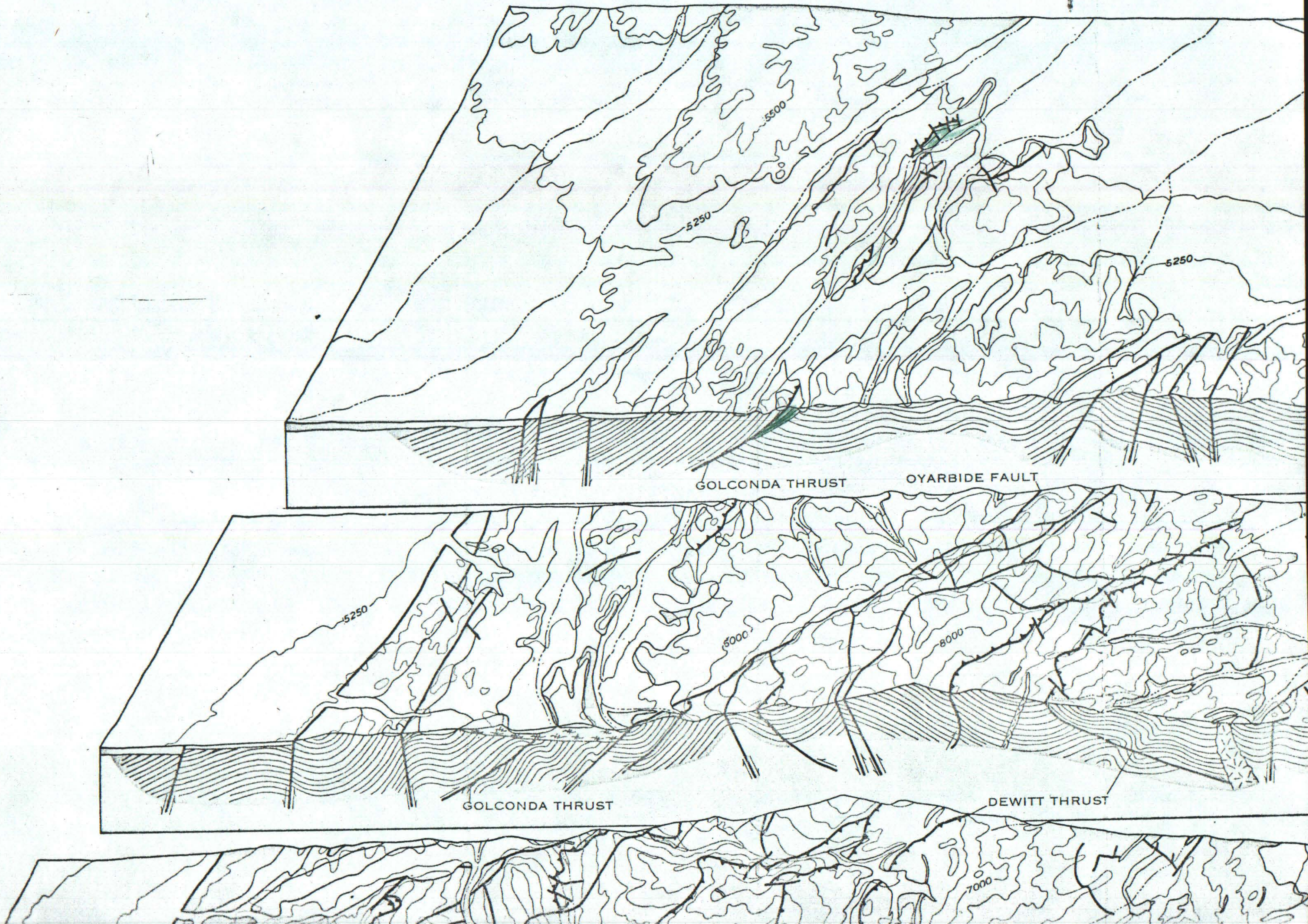
A highly significant fold in the Golconda block is the overturned northward-striking syncline on the ridge west of Galena (fig. 36*B*). The axis of the syncline is well exposed on the west side of the ridge, and it seems likely that it is only one of several parallel isoclinal folds that characterize the lower part of the Golconda thrust plate in this area.

A related fold has been mapped in the lower plate block at the Copper Canyon mine; core drilling in the workings indicates that the Battle Formation has been overturned to the east in a manner similar to the overturning in the upper plate. The northerly trend of overturned folds and westerly pitch of grooving on thrust surfaces at the Nevada mine also indicate that the upper plate of the Golconda thrust plate moved eastward.

Thrust faults.—Except for the sole thrust, the Golconda thrust fault, no other thrusts were mapped in the Golconda block. Doubtless there are others, but they do not appear to cut the Havallah formation, and therefore were not recognized. High-angle reverse faults, which may be related to thrusting, are described in the following section.

High-angle faults.—High-angle faults that cut the Golconda block can be conveniently divided into four principal sets: (1) Northward-trending reverse faults, (2) northeastward-trending normal faults, (3) northwestward-trending normal faults, and (4) range-front faults.

The northward-trending reverse faults in the block dip westward, like the dip of the thrust. Three of them are broadly arcuate in plan and are concave westward, parallel to the trend of the thrust. Because of this parallelism and as they are the oldest set of faults, they are believed to have formed during thrusting. Some of the reverse faults have large displacements; the one in the upper part of Rock Canyon repeats the Antler Peak Limestone and the Battle Formation and has a minimum dip-slip displacement of 4,000 feet. The two to the west, one on the west side of the 7,270-foot hill and the other passing about half a mile east of the Black Rock Mine, have smaller, but significant displacements.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