

The structure here described briefly is very obvious and widely known. My reason for reporting on it is the hope that a number of qualified persons will give it some detailed attention and endeavor to arouse some fruitful investigations and discussions leading to a satisfactory explanation of its origin and mode of formation.

It was first brought to my attention in 1960 by Mr. Will T. Scott, formerly of Ft. Worth but then in La Mesa, Calif. I have talked to several geologists about it. The classical attitude seems to be to regard it as a sink or solution slump formation, but I have not located any definite pronouncement or even a paper treating it. I do not feel it should be dismissed casually. There are elements of uniqueness and peculiarities that point first to one theory and then to another.

The "crater" ((I use the word throught in a neutral sense as to origin) is about 14 miles Southwest of Colorado City, Mitchell County, Texas, just east of State Highway 163 between the drainages of Horse Creek and Beal's Creek. This is about 4 miles southwest of the settlement of Spade. It is on the Renderbrook Ranch, to whose owner, Jessie Elwood Chappell, and manager, O. F. Jones, we are indebted for permission to visit the site on two reconnaissance trips. They have for some 40 years referred to it as "Meteor Mountain".

The co-ordinates are about 101° ' W., 32° 13' N., just off the edge of the Spade Ranch quadrangle issued by the Geological Survey in 1959. The crater will show on the next sheet published to the west, and feeling that field work was in progress on this

area I have specifically called the crater to the attention of the Geological Survey staff, both in Washington and at the Astrogeology offices

The crater is roughly circular and 0.3 miles in diameter, but closer attention to photographs show it is slightly elongated along a northeast-southwest axis. It is shown well on U.S. Department of Agriculture photographs URI-2V-177 and 178 which I am here exhibiting. A proper combination of these yields an excellent stereographic effect.

Photographs from the ground are not too impressive except those taken from a hill or ridge 120 feet higher and about 0.5 mile to the northwest, a High Plains outlier of Tertiary formations locally known as Elephant Mountain but marked Beal's Mountain on the topographic map. Photos taken from a plane by Mr. Sam Bishop of Midland are the best obliques I have seen. I am greatly indebted to him for much time and discussion about the formation and he accompanied several of us on one trip there, but statements or opinions expressed herein are not necessarily his views. Under favorable conditions the crater can usually be seen to the south from commercial airliners on the Ft. Worth-Dallas-Midland flight as the plane normally goes over Colorado City.

The surface geology in this immediate region is in a Triassic outcrop that occurs in a fairly narrow roughly north-south strip in this part of Texas. Pennsylvanian formations begin shortly to the east, and in view to the south are Cretaceous hills.

The crater is a beautiful rampart of red Triassic

sandstone, perhaps 20 feet above the surrounding plain on the southwest and somewhat less, say 10 to 15 feet, on the northeast. The wall has broken ever so often thru erosion and at the very edges has slumped outwards. But a careful look shows at once that the supporting sandstones actually slope inwards consistently with a gentle dip of about 10 to 15°. There is no sign of any great shattering, faulting or folding; there are no jumbled rocks or breccia. I need hardly add there are no meteorites and the local residents do not know of any being found even in the vicinity.

The central area of the crater is actually higher than the walls and is probably basal Cretaceous capped with Tertiary. Between the central area and the walls there is thus a ring lower than the rest. Into this a number of loose rocks have washed and been scattered, presumably mostly from the Triassic and other higher layers in the center. There is a high concentration of iron oxide nodules or concretions, often compound, and many bits of a very hard white quartzite, along with colored cherts. Most of these are probably from the Triassic. This is chiefly a continental deposit here with little chance to tell anything from fossils. The sandstones are thinly laminated and it would probably be hard to correlate them/with layers elsewhere in the region.

There is a probable secondary ring of the same nature as the main wall, but not nearly so well or obviously developed. It appears mainly as a few/detached hills of a cuesta type south and southeast of the main crater; these hills slope gently on the

side towards the crater, more steeply on the side away from the crater. A tank has been built between two of these hills. This type of outcrop can be traced on around towards the east or north but it is hard to see an actualy continuation of this secondary ring all the way around. Actually the nearby road acuts thru the possibl~~y~~e position of the ring extension on the southwest.

A large pipe-line for water from lakes to the north and running to an oil field to the south was being installed when we were there on a trip May 26, 1963, and we could inspect an open ditch about 6 feet deep. This ran south of the crater between the primary walls and the secondary ring. A little northeast of the tank we found some ~~x~~ layers of white sandstone exposed ; these often occur in the Triassic. The dip towards the center of the crater was beautifully evident at 15° measured with a Brunton pocket transit (approximately). The strike was North 72 East and the direccion towards the central hill N 18 W, showing the dip clearly towards the big middle.

There are thus two synclinal structures with a hill in the center and by now most of those are probably siding with the normal geologists who would attribute this to solution or slumping. I myself do to a certian extent.

There are two grave objections to this simple ~~and~~ origin. First, what dissolved to such sinking; second, why is this formation so unique in this region?

the sandstone is more resistant to weathering.