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 prigin 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 throut in a neutral sense as to origin) is about 14 miles Southwest of Colorado City,

M, tchell 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 ewner, Jessie Elwood Chappell, and manager, O. F. Jones, we are indebted for permission to visit the site on two reconnaisance 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 Gological Survey staff, both in Washingaton and at the Astrogeology offices

The crater is roughly circular and 0.3 miles in diameter, but closer attention to photographd show it is slightly elongated along a noratheast-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.

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. Photo's taken from a plane by Mr. Sam Boshop of Midland are the best obliques I have seen. I am greatly indebted to him for m ch 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 ususally be seen to the south from commercial airliners on the Ft. Worth-Dallad-Midland flight as the plane normally goes over Colorado City.

The surface geology in this immediate region is in a Trisassic outcrop that occurs in a fairly narrow roughly rmian north-south strip in this part of Texas. Pennsylvanianx formations begin shortly to the east, and in vew 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 ance 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 cetral area dn 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 quaratzite, along with colored cherts. Most of these are probably from the Triassic. This is chiefly a continental deposit here with little chance to tell anythingg The sandstones are thinly laminated and it would from fossils. definitely 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.

detached

It appears mainly as a few/hills of a cuesta type south and southeast of the main crater; these hills slope gently on the

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 possible 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 noratheast of the tank we found some we 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 direction towards the central hill N 18 W, showing the dip clearly towards the bifg 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 to to a certian extent.

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

The Triassic sedmients here involved are right at
edge of this formation's exposure and presumbly quite thin
short
and underlain in a very/distance by Permian. These sediments
thin
are thick and do contain some/layers of EEEEx anhydrite,
dolomite and possibly salt inter edded in sandstone and shale,
but their total thickness is so slight and they are so scatteered
thru the section that it is very unlikely there would be enough
solution to form such a structure.

And if there was, why are there not others in the vast regions of West Texas where the Permian is exposed or covered by only a thin layer? Several reliable gologists have told me they know of no other like this.

There is a certain amount of covering by Quaternary outside gravels around the main walls. I doubt if ditching would reveal anything significant and certainly do not urge any such measures.

One suggestion which has emerged from discussions is

the question what would underlie the anticlinal structure

and jumbled rock masses of astroblemes as they are now

described and denominated. **Arezibeszzezeszetzkekzkekzekz

underzibezekddis/zekxthexerzizek*

Hvae these all been eroded

away here and we got down to the true root of the crater,

which may have been depressed by the impact but due to the

overburdern did not rebound and therefore remained in a synclinal

state/ We would have to assume that somewere, with depth,

the strata may stay in a depressed state instenad of returning

to normal. The original brecciation, dip away from the center

walls, and meteorites, have all supposedly been destroyed.

We are seeing a truly fossil basal remnant preserved only becau

the sandstone is more resistant to weathering.