

U. S. Geological Survey
OPEN FILE REPORT
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1. Meteorite approaches ground at 15 km/sec.
2. Meteorite enters ground, compressing and fusing rocks ahead and flattening by compression and by lateral flow. Shock into meteorite reaches back side of meteorite.
3. Rarefaction wave is reflected back through meteorite, and meteorite is decompressed, but still moves at about 5 km/sec into ground. Most of energy has been transferred to compressed fused rock ahead of meteorite.
4. Compressed slug of fused rock and trailing meteorite are deflected laterally along the path of penetration. Meteorite becomes liner of transient cavity.
5. Shock propagates away from cavity, cavity expands, and fused and strongly shocked rock and meteoritic material are shot out in the moving mass behind the shock front.
6. Shell of breccia with mixed fragments and dispersed fused rock and meteoritic material is formed around cavity. Shock is reflected as rarefaction wave from surface of ground and momentum is trapped in material above cavity.
7. Shock and reflected rarefaction reach limit at which beds will be overturned. Material behind rarefaction is thrown out along ballistic trajectories.
8. Fragments thrown out of crater maintain approximate relative positions except for material thrown to great height. Shell of breccia with mixed meteoritic material and fused rock is sheared out along walls of crater; upper part of mixed breccia is ejected.
9. Fragments thrown out along low trajectories land and become stacked in an order inverted from the order in which they were ejected. Mixed breccia along walls of crater slumps back toward center of crater. Fragments thrown to great height shower down to form layer of mixed debris.

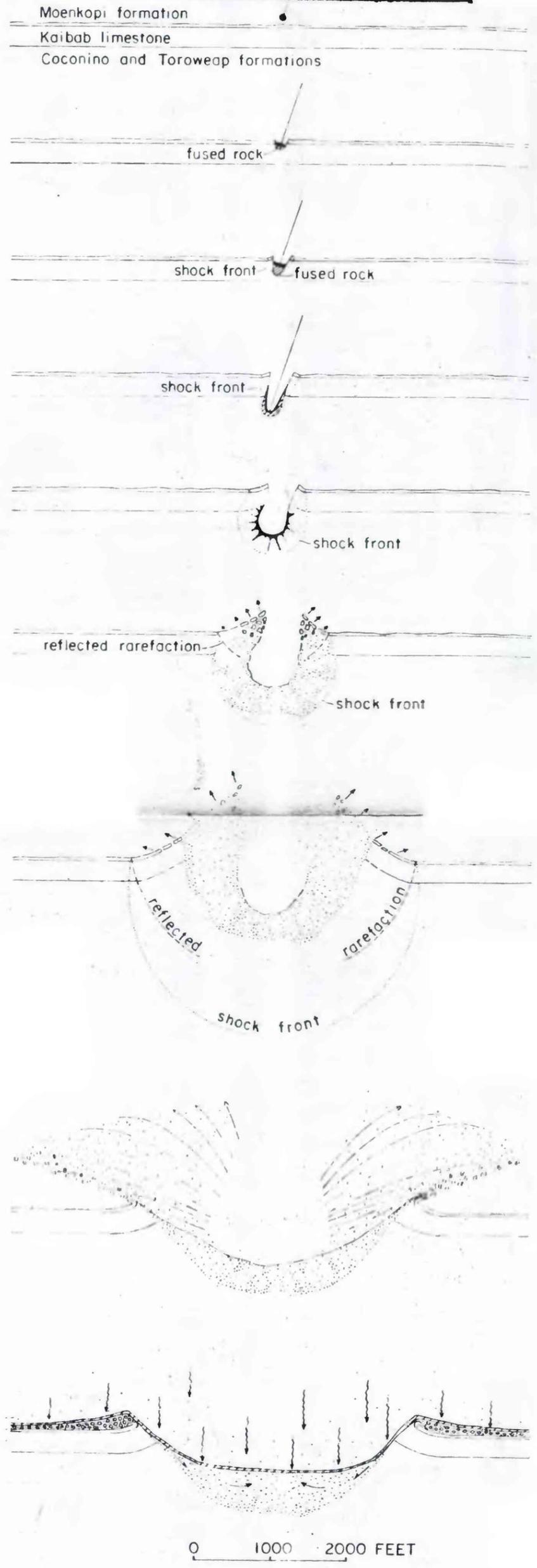


FIGURE 7 DIAGRAMATIC SKETCHES SHOWING SEQUENCE OF EVENTS IN FORMATION OF METEOR CRATER, ARIZONA