stripped-bedrock ridges enclosing radar-dark eolian (?) plains. Other tracts are now eroded to almost continuous bedrock distinguished by numerous much-subdued, large, subcircular rims and basins. The prevailing interpretation of these diverse ring complexes as produced by crustal shortening and magma upwelling cannot account for their superimposed circular patterns.

Misunderstanding of visual illusions in radar imagery detracts from some interpretations. The scale of imagery in the sideldook direction is not horizontal distance but rather is proportional to slant distance. Slopes facing the spacecraft are foreshortened because their tops and bottoms plot close together, whereas slopes facing away are lengthened, an effect opposite to that of optical imagery. Symmetrical ridges appear to be hogbacks dipping gently in the direction of radar look, and such illusions have been misinterpreted to be thrust-imbricated sheets [2,12]; straight ridges of varying heights can mimic contorted and faulted structures.


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Only rare quartz grains with single-set planar (1013) deformation features (PDFs) are present in breccia dikes found in association with uniformly oriented shatter cones that occur over an area 8 × 25 km (see Fiske et al., this volume). This suggests that the

Fig. 2. Southwestern Montana Recess in Sevier Front (from [4]).

Beaverhead shocked rocks come from only the outer part of the central uplift of what must have been a large (>100 km diameter) complex impact structure. These rocks are allochthonous. They are present in the Cabin thrust plate (one of many in the Cordilleran belt), and are considered to have been tectonically transported 50 to 150 km east-northeast from a source in east central Idaho during the Laramide orogeny [1,2].

An impact event of this magnitude on continental crust (thought to have occurred in late Precambrian or early Paleozoic time) could be expected to punctuate local geologic history. Furthermore, although it may now be covered, its scar should remain despite all the considerable subsequent erosion/deposition and tectonism since the impact. The following are three large-scale singularities or anomalies that may reflect the event and mark its source.

Fig. 1. Location of Lemhi Arch (from [3]).

Fig. 3. Detail of apex of Southwestern Montana Recess (from [4]).
1. The Lemhi Arch (Fig. 1) is a major structural uplift that occurred in late Proterozoic-early Paleozoic time in East Central Idaho and caused the erosion of at least 4 km of sedimentary cover [3]. This may be directly related to the impact.

2. Of the many thrust sheets comprising the Cordilleran belt, the Cabin plate that carries the shocked rocks is unique in that it alone intersected the crystalline basement [2]. It also now marks the apex of the Southwest Montana Recess in the Sevier front [4] (Figs. 2 and 3). The basement uplift remaining from the impact may have constituted a mechanical obstacle to the advancing thrust sheets in Cretaceous time, causing the recess. Perhaps a piece from the western edge of this uplift was sliced off and transported by the Cabin thrust.

3. What could be interpreted as a roughly circular aeromagnetic anomaly ~70 km in diameter can be discerned in the state aeromagnetic map [5] centered about 20 km southeast of Challis, Idaho, in the Lost River range (Fig. 4). It is in approximately the right place, and ignoring the possibility that the anomalies have diverse causes and the circular pattern is coincidental, it may mark what remains of the buried central uplift structure!

The relevance of these speculations in the search for the source of the Beaverhead shocked rocks will be explored this summer and reported at the meeting.