

As to the formation of this basin, or caldera, of whose rim three segments remain, three divergent hypotheses were suggested by facts observed in the field: (1) A glacial cirque in which the vent happened to open. (2) A caldera resulting from the giving way of the surface under the cone, and its partial sinking. (3) A caldera due to the destruction by explosion of an earlier cone.

The first of these hypotheses is open to several objections: (a) A salient angle on the side of a deeper valley is an improbable place for the formation of a cirque. (b) The truncated lava-flow above described would have to be accounted for by one of the other two hypotheses in any event, and (c) The glaciated condition of a part of the surrounding Miocene lava which might represent the discharge from the cirque, may also be due to a small glacier which was formed on the side of the cone itself.

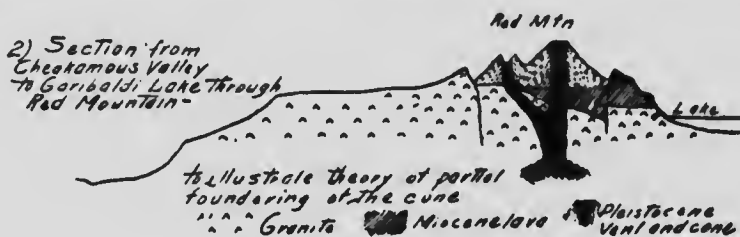


FIG. 2

The second hypothesis has been advanced in the case of the caldera of Mount Mazama in Oregon, but is combated by the mechanical difficulty of causing a fault block to sink into an opening which narrows rapidly downward so far as the scarps exposed would indicate. There is no observed evidence of crush-zones or other criteria of faulting. The fact that the upper part of the truncated lava flow cannot be traced in the present cone would indicate that the foundering, if any, was complete, and the present cone built up subsequently. The accompanying figure would indicate the condition of a partial foundering, in which case flows which extended outside the caldera would be faulted, but probably recognizable on the sunken central part of the cone. (Fig. 3).

The hypothesis of destruction by explosion remains the most probable of the three. It is open to the contention that the fragmentary products of the explosion are not to be found around the vent. This objection may be answered by postulating their removal by glaciation. The surface of the granite outside the caldera on the west, slopes down rather steeply for about 600 feet, to the level of the surrounding country, as if that part of the underlying rocks covered by the volcano had been protected from erosion (see fig. 2), so that the cone stood on a