

Big Basin Impact Craters of Western Kansas

Jan P. Cannon
Planetary Data, Tecumseh, Oklahoma

A sharply defined basin, 1,300 m in diameter, 35 m deep, and with internal drainage, is located 45 km south of Dodge City, Kansas. This feature is named Big Basin on topographic maps of the region. It has been considered to be of solution origin.

Remote-sensing investigations of the area revealed that the feature had two small satellite pits approximately 300 m in diameter. This cluster of holes is an isolated phenomenon in this area. However, the cluster of one large crater and two nearby smaller ones is similar to numerous primary impact crater clusters that occur on other planets. This type of clustering does not occur in areas of karst. The remote-sensing data further showed prominent radial fracture sets and a polygonal shape that reflects the regional fractures.

Subsequent field work revealed that the strata on the rim of the larger hole dip radially away from the center of the feature. The rim and wall materials are intensely fractured. These observations are indicative of impact features and not solution features.

When the Big Basin Crater is compared physically with Meteor Crater, Arizona, and Upheaval Dome, Utah, it shows a close similarity to Meteor Crater, Arizona. This similarity is indicated by polygonal shape, size, and radial features. Big Basin seems to be filled partially with wall and rim materials. It is more eroded than Meteor Crater, Arizona. The walls of the Big Basin Crater contain cherts that seem to have been extracted partially by early man for tools. Tektites and magnetic material occur beyond the rim area.