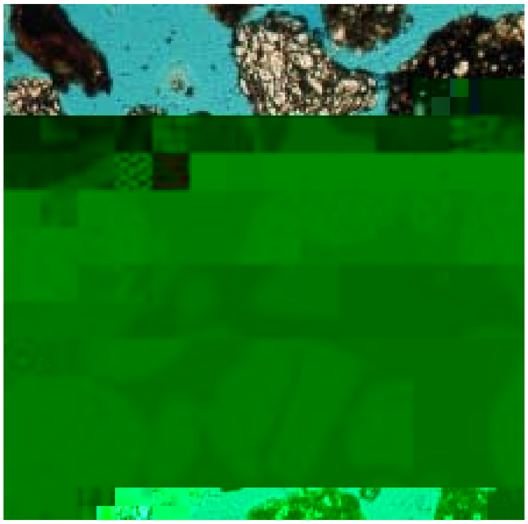

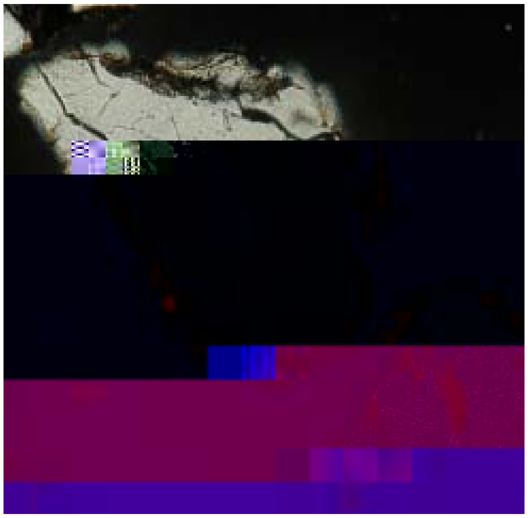

Sandstone from Barringer (Meteor) Crater in Arizona. Also, Dr. W. Feathergale Wilson (2002, per. commun.) has observed similarly fractured quartz from the Bee Bluff Impact Structure in Texas. The presence of iron oxides coating fractures in deeply weathered grain shows that they are not artifacts of thin-section preparation. In contrast, none of the control samples showed the intensity of fracturing observed in samples associated with the Brushy Creek feature.

Shocked quartz occurs in samples from sand collected from the alluvium of Brushy Creek. It consists of several quartz grains with single and two sets of planar features (Figure 4). The average orientation of quartz grains with two sets of planar is 45 degrees and 33 degrees which, respectively, are the {1012} and {1122} crystalligraphic orientations (Stephen Benoist 2003, per. commun.). As discussed by Koerbel (1997) and Stoffler and Langenhorst (1994), both orientations are characteristic of planar deformation features (PDF) created by shock metamorphism. The multiple grains found with PDFs and planar features argued against them having been reworked from distant sources, e.g., a Cretaceous - Tertiary boundary layer. Instead, it indicates that they came from a nearby primary source, i.e., the upstream Brushy Creek feature. Sand from the gravelly mud within the feature's rim contains numerous quartz grains with planar fractures that are currently under study.

Numerous ironstone nodules were cut and examined and, sometimes either thin sectioned or tested for high concentrations of nickel using dimethylglyoxime. Highly weathered meteorites, called "iron shale" or "shale balls" were not found. Instead, the ironstone nodules examined were all pedogenic in origin as the nodules typically found in local soils.

A number of processes, including salt diapirism, solution karst, and volcanism, can produce circular landforms, similar to the Brushy Creek feature. Because this feature lies in a portion of the Louisiana Gulf Coastal Plain devoid of salt diapirs and major salt structures, salt diapirism cannot be invoked to explain this feature. Similar, the complete absence of volcanic sediments from this feature and the complete absence of Pleistocene and Holocene volcanism within Louisiana Gulf Coastal Plain also precludes this feature from being a volcanic maar. Similarly, the lack of significant carbonates within the upper 11,000 to 12,000 ft (3,350 to 3,660 m) precludes carbonate karst processes as an explanation.

Siliciclastic karst can create landforms similar to the Brushy Creek feature, as discussed by (May and Warne 1999) for the origin of the Carolina Bays within the Atlantic Coastal Plain and circular depressions c

Mossa, J., and Autin, W.J., 1989, Quaternary geomorphology and stratigraphy of the Florida parishes, southeastern Louisiana. Louisiana Geological Survey Guidebook Series no. 5, 98 p.

McCulloh, R.P., Heinrich, P.V., and Snead, J., compilers, 1997, Amite, Louisiana 30 x 60 minute geologic quadrangle (preliminary): Prepared in cooperation with U.S. Geological Survey, STATEMAP program, under cooperative agreement no. 1434-HQ-96-AG-01490, 1:100,000-scale map plus explanation and notes.

Shoemaker, E.M., and Kieffer, S.W., 1979, Guidebook to the Geology of Meteor Crater, Arizona: Publication No. 17, Center for Meteorite Studies, Arizona State University, Tempe, Arizona, 65 p.

Snead, J.I., and McCulloh, R.P., 1984, Geologic Map of Louisiana: Louisiana Geological Survey, Baton Rouge.

LOUISIANA STATE UNIVERSITY
Louisiana Geological Survey
3079 Energy, Coast & Environment Building
Baton Rouge, Louisiana 70803

T