The LSU Mounds were studied by LSU professors Richard Kesel, Robert Miller, and Museum of Natural Science Curator Robert Neuman in 1982. These scientists took a series of cores across the mounds to determine whether or not it was built in stages and to recover organic material that could provide radiocarbon dates. Soil analysis indicated that the mounds were built up continuously rather than in stages. One scenario consistent with this result is that Native Americans gathered at the site seasonally for rituals and deposited soil on the mounds as part of the celebration (there are ethnographic examples of similar behaviors). Three radiocarbon samples from soils immediately below Mound A (the northernmost mound) produced dates of 4510 ± 185, 5345 ± 235, and 4840 ± 180 B.P. The second number in each date is the range of error on either side of the B.P. (before present) date; these were relatively large (a range of error of 60-80 years is common). Despite the large ranges, the dates (which calibrate to between 6600 and 4800 B.P.) placed the LSU Mounds securely in the Archaic period (11,450 to 3,200 years ago) when most archaeologists did not believe cultures were complex enough to build mounds. More information on mounds, radiocarbon dating, and Louisiana prehistory is available in the Museum of Natural Science, Foster Hall.

In 1985, graduate student Jeffrey Allen Homberg supervised excavations of 5 1-x-1-meter test pits around the flanks of the mounds prior to the construction of the brick bulwarks. Only one artifact was recovered from the mound fill in these excavations, a small pebble that was used as a tool.