USING THE PENTAX TOTAL STATION AND ARCVIEW TO ANALYZE THE FOSSIL ACCUMULATIONS WITHIN THE CONATA PICNIC GROUND EXCAVATION, BADLANDS NATIONAL PARK, SOUTH DAKOTA

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ABSTRACT

During the summer of 1993, two visitors stumbled upon a paleontological treasure in the Big Badlands of South Dakota, an Oligocene bone-bed located in the Scenic Member of the Brule Formation now known as the Big Pig Dig. To date, this site has yielded over 6,000 fossils. The faunal list for this excavation consists of the *Archaeotherium*, *Subhyracodon*, *Mesobippus*, *Leptomeryx*, *Merycoidodon*, *Ischyromys*, and a *Nimravidae*. The bone density at the site can be as high as 100 bones per square meter. This can make interpretation problematic at best.

The purpose of this project was to determine if this fossil accumulation was the result of a single event and to determine individual bone association within the high-density accumulation. To aid in the interpretation of this site, precise field maps were created using a surveyor’s transit, the Pentax Total Station, and the GIS program, Arcview. These maps show details not visible in typical field maps. Entering bone coordinates and identifiers directly into a table allowed for rapid assimilation and interpretation of the data with minimum modification. These tables were then converted into shape files and used to develop overlays in Arcview, a spatial modeling program. By isolating and examining the data files for a single taxon, it is now possible to determine the extent of an individual animal within the quarry. This method has proven successful in showing the association between fossils bone elements at the Pig Dig with a high degree of certainty.