



## Paleontology in Action

### *The Big Pig Dig*



*The National Park Service, working with South Dakota School of Mines and Technology (SDSMT), will spend another summer at the Pig Wallow Site, nicknamed the Big Pig Dig. From early June through late August, student paleontologists carefully remove centuries of sediment to expose more mysteries buried deep within the Badlands strata. The excavation started in June 1993 when two visitors from Iowa discovered a large backbone protruding from the ground near the Conata Picnic Area. Fortunately for all of us, these visitors followed the correct procedure: They left the bones undisturbed and contacted staff at the Ben Reifel Visitor Center. Although fossils are common in the Badlands, the newly discovered site sparked the interest of the park staff. Originally thought to be a four-day excavation, the site is now in its eleventh season of excavation.*

### **An African Watering Hole in South Dakota**

The site's name, the Pig Dig, comes from that first exposed fossil, originally thought to be the remains of an ancient pig-like mammal called *Archaeotherium*. It was later identified as a *Subhyracodon*, a hornless rhinoceros, but the name "Big Pig Dig" stuck. Rhinoceroses are found today in Africa and Asia but smaller versions once lived in the Badlands. *Archaeotherium* has been found at the site, as well as multiple specimens of ancient horses and deer-like creatures. The horses found are three toed and about the size of a small dog. The tiny *Leptomeryx* resembles a deer standing only a foot high. More than 10,000 bones have been excavated from the site for research purposes. *Why so many animals in one small place?* Scientists believe that the area was once a spring-fed watering hole, similar to the large watering areas used by African game today. As the climate began to change to semi-arid, the creatures had to travel longer and longer distances to find water. Some perished as they fought to survive after being mired in the soft sediments. Opportunistic animals were drawn to feed on the dead carcasses. *Archaeotherium* was a scavenger, feeding on both plants and flesh. These large creatures trampled the site, deeply imbedding some bones and breaking up skeletons. *Taphonomy* is the study of how fossils are formed and preserved. Taphonomists working at the Pig Dig study the position and condition of bones at the site. These scientists attempt to interpret the activities of animals and try to puzzle out the conditions under which death occurred.

## The Tip of the Iceberg

Fieldwork has a glamorous reputation from movies like Jurassic Park. Firmly in our minds is the idea of sun burnt scientists diligently working to uncover huge fossilized bones belonging to the great dinosaurs. However, reality is that for every hour of fieldwork, fossil preparators and other scientists spend twelve or more hours in a laboratory cleaning, repairing, and identifying each specimen. Prehistoric creatures range in size from huge dinosaurs to microscopic insects. A single specimen may fill a storage building or one hundred specimens may fit inside a film canister.

After labwork is completed, fossil specimens are maintained in storage facilities for research purposes or for display in museums and similar educational facilities. Each specimen is assigned a unique number for the larger collection of which it is a part. This process of cataloguing specimens includes critical information such as where the specimen was found, when it was found, and identifies it with as much detail as possible. This process enables scientists of the future, who may have more information or improved technology, to continue to work toward solving the mysteries of the paleontological past.

When you visit the Pig Dig, you are seeing the very careful, somewhat tedious work necessary for careful science. The paleontologist's tools of choice are soft-bristled brushes, dental picks, and small trowels. You may see field specimens being "jacketed," or carefully encased in a plaster cast for transport to the storage facility to await preparation for study or display.

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## The Mystery of the Missing Mammals Continues

Simply put, a fossil is a preserved sign of ancient life. Paleontologists study animal tracks and plants preserved over time, as well as bones that have been converted into fossils through natural chemical processes. Additionally, other signs such as feces and pollen have also been fossilized and are studied to help get a broader picture of life in prehistoric North America. Paleontology is a science shrouded in mystery; however, it is not a science that can work in a vacuum. Geologists have examined the individual rock layers contained within the Pig Dig to study the chemistry of the layers and the relationship between the fossils and the surrounding strata. Evolutionary biologists use specimens from the Badlands and compare them to relatives living today to try to create the path of change and adaptation that permitted some animals to thrive and others to become extinct.

The Pig Dig is an excellent example of the questions professionals have to answer: *What events led to this large conglomeration of dying animals in one place?* Oreodonts are the most common mammal found in the Badlands but only a few oreodont remains have been found in this site. *Why is the most common mammal so rare at this site?*

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## Becoming a Part of Paleontology

You can help protect paleontological resources here and anywhere you travel by following these tips:

- Leave fossils where you find them. It's tempting to pick them up and take them with you but don't. Removing them from their context destroys much of the information critical to scientists. Context refers to where they are found geologically and in what position the fossils are found.
- By removing fossils, you have also committed a crime. Fossils are a non-renewable resource protected in national parks like all other resources. Other public lands have similar regulations.
- Be an informed visitor. Be familiar with current issues in paleontology. Once you watch for fossils in the news, you'll find them discussed almost daily.
- Support research through donations. Donations can be made to paleontology research or education. Call (605) 433 - 5240 for more information