Late Triassic Dinosaur Tracks Reinterpreted at Gettysburg National Military Park

By Vincent L. Santucci and Adrian P. Hunt

Long before the footsteps of union and confederate soldiers traversed south-central Pennsylvania, early dinosaurs left their footprints in ancient mud. Fossilized tracks preserve evidence that dinosaurs existed in the Gettysburg area over 200 million years ago during a time period called the Triassic. The tracks also illustrate another example of a NPS unit, primarily focused on cultural resources, that must face the challenges of managing and interpreting paleontological resources.

The dinosaur tracks are preserved in blocks of mudstone that were quarried from an area outside park boundaries. However, the quarried blocks were transported to the park and used in the construction of stone bridges during the 1930s. In 1937, over 50 additional tracks were discovered in blocks from another nearby quarry within Adams County. The park superintendent at that time was especially interested in the fossils and placed some on display within the park. He encouraged interpretation of the tracks and unofficially coordinated distribution of some specimens to the Smithsonian Institution, Carnegie Museum of Natural History in Pittsburgh, and the State Museum of Pennsylvania in Harrisburg. Today, the tracks are informally monitored by park rangers and are interpreted by rangers and concessioners alike.

Altogether, tracks are known from two localities in Gettysburg Basin, the Trostle Quarry in Adams County, and a smaller quarry near Goldsboro in York County. All were discovered in the Late Triassic Gettysburg Shale, a rock formation that also occurs within the park. These deposits were laid down in a gradually deepening trough of sediments that comprise the Newark Supergroup.

The park files at Gettysburg National Military Park identify these fossil tracks as *Grallator* and *Anchisauripus*. However, these identifications are based upon interpretations recognized in the 1930s. Research into fossil tracks has advanced significantly over the past two decades and we are now able to offer a different interpretation of the Gettysburg tracks. The fossil tracks represent the ichnogenus *Atreipus* which was first described by Olsen and Baird in 1986. The tracks can be further identified to the ichnospecies *A. mil-fordensis*.

Atreipus milfordensis represents, as of yet, an undescribed dinosaur that exhibits a theropodlike pes (foot) in combination with a short-clawed and functionally tridactyl (three-toed) manus (hand). The track pattern indicates that this dinosaur habitually used all four limbs in locomotion. The manus track is incompatible with any known theropod (carnivorous, upright dinosaurs like Tyranosaurs, that usually have small forelimbs). Thero-pods have large trenchant manus claws that are designed for grasping, not walking. This pattern of manus and pes tracks is unusual and a condition not exhibited in any other described dinosaur tracks.

The tracks are recognized as dinosaurian because of the birdlike tridactyl pattern of the pes track (fig.1). This pattern, represented in the foot skeleton, is a derived character for dinosaurs. Olsen and Baird (1986) suggest that *Atreipus* may represent the track of a very early ornithischian (bird-hipped) dinosaur.

Late Triassic tracks are also known from Dinosaur National Monument and Petrified Forest National Park (Santucci & Hunt 1993). The Late Triassic was the phase of vertebrate history in which the dinosaurs first originated. Research investigations regarding fossil tracks provide information not available solely through the study of fossil bones and teeth. Tracks and trackways can yield information about behavior, locomotion, and paleoecology. Additionally, as with the Gettysburg fossils, tracks can yield information about animals that are not yet known from skeletal material. The presence of early dinosaur tracks at Gettysburg provides park rangers with the opportunity to interpret the local history well before the fateful days in July 1863. PS



Figure 1. Fossil manus and pes tracks of Atreipus milfordensis *from atop a stone bridge at Gettysburg National Military Park, Pennsylvania.*

Literature Cited

Olsen, P.E., and D. Baird. 1986. The ichnogenus Atreipus and its significance for Triassic biostratigraphy. Pages 61-87 in K. Padian, editor. The beginning of the age of dinosaurs. Cambridge University Press, New York.

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