

New theropod and ornithopod dinosaur trackways from the Berriasian of Münchehagen (Lower Saxony, Germany)

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Since more than two centuries, the Lower Cretaceous sandstones of Lower Saxony in northern Germany are well known for their abundant fossil dinosaur tracks. Until now, however, these sandstones produced mainly isolated track casts. The Münchehagen tracksite, situated approximately 50 km west of Hannover, is one of the few exceptions. The Berriasian sediments of this site are already well-known for their sauropod trackways and one poorly preserved ornithopod (iguanodontid) trackway.

In summer 2004, digging activity in a quarry near this tracksite revealed a large bedding surface with abundant tridactyl dinosaur tracks. To date, approximately 80 m² of the new tracksite are uncovered, yielding five trackways belonging to the ichnogenus *Iguanodontipus* and two »allosaurid« theropod trackways. All trackways show bipedal gaits. The new tracksite is highly significant because 1) its excellent preservation of theropod and ornithopod tracks 2) the general scarcity of longer trackways in the Early Cretaceous of northern Germany 3) the unusual walking directions of the track-producers.

The trackway layer is a fine-grained mudstone which superbly preserved tracks as well as ripple marks. The iguanodontid tracks (n=37; longest trackway: n=18) measure 24–44 cm in length and width, thus corresponding to subadult animals with a body length of about 5 m. Interesting features of the trackways are »gliding« structures and tracks, where the deep mud was possibly squeezed around and between the toes and hoofs, respectively, during movement. These structures together with the short pace (49–77 cm; mean: 69 cm) and stride length (104–156 cm; mean=134 cm) might indicate that the iguanodontids walked carefully in the unstable sediment. All *Iguanodontipus* trackways run in different directions, three of them crossing each other, and none of them represents a straight line of walking.

One of the theropod trackways consists of five tracks, the other of two tracks. The width of the tracks is 23–27 cm (mean=24 cm), the length is 28–40 cm (mean=35 cm). The pace of the longer trackway is 102–113 cm (mean=107 cm), the stride is 210–220 cm (mean=216 cm), indicating a relatively fast running animal. Ongoing research will clarify if these small theropod trackways represent a new ichnogenus. The new locality has an unbroken high potential for wide-ranging trackways. Several thousand square meters of the tracksite layer still need to be excavated, including the continuation of one of the theropod trackways. Due to an ongoing co-operation between the quarry company, the Dinopark Münchehagen and the State Museum of Lower Saxony in Hannover, the scientific excavation of the trackway layer will continue in summer 2005.