

# Earliest Animal Footprints Ever Found -- Discovered in Nevada

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Pictured below is the trackway of one of the earliest animals, a multilegged creature that walked over the bed of an ancient sea once covering Nevada. The animal left behind a pair of parallel impressions -- small, round dots in the silt that later became rock. Photo by Kevin Fitzsimons, Ohio State University

The fossilized trail of an aquatic creature suggests that animals walked using legs at least 30 million years earlier than had been thought. The tracks -- two parallel rows of small dots, each about 2 millimeters in diameter -- date back some 570 million years, to the Ediacaran period.

The Ediacaran preceded the Cambrian period, the time when most major groups of animals first evolved.

Scientists once thought that it was primarily microbes and simple

multicellular animals that existed prior to the Cambrian, but that notion is changing, explained Loren Babcock, professor of earth sciences at Ohio State University.

"We keep talking about the possibility of more complex animals in the Ediacaran -- soft corals, some arthropods, and flatworms -- but the evidence has not been totally convincing," he said. "But if you find evidence, like we did, of an animal with legs -- an animal walking around -- then that makes the possibility much more likely."

Soo-Yeun Ahn, a doctoral student at Ohio State, presented the discovery in a poster session at the Geological Society of America meeting Sunday in Houston. Coauthors included Margaret Rees of the University of Nevada, Las Vegas, and J. Stewart Hollingsworth of the Institute for Cambrian Studies.

Babcock was surveying rocks in the mountains near Goldfield, Nevada, with Hollingsworth in 2000 when he found the tracks.

"This was truly an accidental discovery. We came on an outcrop that looked like it crossed the Precambrian-Cambrian boundary, so we stopped to take a look at it. We just sat down and started flipping rocks over. We were there less than an hour when I saw it."

The creature must have stepped lightly onto the soft marine sediment, because its legs only pressed shallow pinpoints into that long-ago sea bed. But when Babcock flipped over the rock containing those tracks, the low-angle sunlight cast the dots in crisp shadow.

He immediately suspected that the tracks were made by an arthropod, such as one resembling a centipede or millipede, or by a leg-bearing worm.

He couldn't be certain of the length of the creature, or the number of legs it had. But judging from the tracks, he guessed that it carried its centimeter-wide body on many spindly legs.

In 2002, other researchers reported a similar fossil trail from Canada that dated back to the middle of the Cambrian period, about 520 million years ago. Another set of tracks found in South China date back to 540 million years ago.

At approximately 570 million years old, this new fossil not only provides the earliest suggestion of animals walking on legs, but it also shows that complex animals were alive on earth before the Cambrian.

Not many macroscopic fossils exist from that time because soft-bodied creatures are not normally preserved.

Babcock is an expert in "exceptional preservation" -- the special chemical, physical and biologic conditions that enabled some soft-bodied creatures to fossilize. By knowing where to look in the geologic record, he has uncovered a menagerie of unusual fossils, from unusual echinoderms in Nevada to sulfur-eating bacteria in Antarctica.

The shallow sea covering western Nevada 570 million years ago would have been a good site for exceptional preservation. The sediment surface was probably bound together by a microbial mat -- a cohesive carpet of bacteria and sediment grains. A creature's tracks could have been readily preserved when the animal pressed its legs into the sediment.

Babcock says that he is "reasonably certain -- not 100 percent" that the fossil was made by a centipede-like arthropod or a leg-bearing worm. A fossil of the animal itself would be more definitive. He is going to continue looking in the same region of Nevada, but that is not the only potential site. Similar fossils might be found in the White Sea area of

Russia, South Australia, Newfoundland or Namibia, where body fossils of Ediacaran organisms have been found.

"I expect that there will be a lot of skepticism," he said about the discovery. "There should be. But I think it will cause some excitement. And it will probably cause some people to look harder at the rocks they already have. Sometimes it's just a matter of thinking differently about the same specimen."

Source: Ohio State University

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