

The Dinosaur Darwin Missed

The Ancient Human Footprint collection of studies

This can be explained by knowing the three earth ages.

The Dinosaur Darwin Missed

It lived 4,800 years ago, say the creationists, and its next-door neighbor was a man.

By Dale S. Turner

If there is one battle Mel and Norma Gabler have been winning in the twenty years they have been objecting to America's textbooks, it is their fight to have creationism taught alongside evolution in biology classes: biology texts today often ignore or substantially downplay evolution. Whereas a 1973 Charles Merrill text contained seventeen references to evolution in its index, the 1979 edition has but three. And other texts, such as a 1980 Houghton-Mifflin biology book, discuss both evolution and divine creation as possible explanations of the origin of life.

True believers like the Gablers can invariably cite chapter and verse from a large, and growing, body of literature arguing that creationism is at least as valid a theory as evolution. Taken as a whole, this creationist literature—and its advocates, many of whom flash impressive-sounding degrees—can seem persuasive. But are the arguments valid? One place to look for an answer to that question is Texas, or, more precisely, the Paluxy River basin in North Texas, 45 miles southwest of Fort Worth.

The Paluxy seems an unlikely center for national controversy. With its sparkling spring-fed water, it is a pretty but unpretentious stream. The town closest to it, Glen Rose, has a population of around two thousand. But controversial the Paluxy is, for the area around it contains one of the heaviest concentrations of dinosaur tracks in the country. On this everyone is agreed, creationist and evolutionist alike. Where the two sides disagree is on the question of whether, alongside those dinosaur tracks, there can also be found fossilized human footprints. The creationists maintain that the answer is yes; the Paluxy River basin, they say, offers proof that the theory of evolution is a fraud. As a creationist leader puts it, "One dinosaur or brontosaurus track found in situ with one human footprint is sufficient to bring the whole Darwinian theory down and to revolutionize all biology today."

The reason for this is simple. Most scientists believe that the dinosaurs died out about 65 million years ago and that man did not make his first appearance on earth until at most 5 million years ago. During that 60-million-year gap, the earth was a constantly changing place: glaciers were shifting, oceans were moving, and species were appearing and disappearing. Creationists, on the other hand, believe that the earth is about 10,000 years old and that all living things were created by God during creation week. Dinosaurs

were put on earth on the fifth day (“So God created the great sea monsters”) and man on the sixth day.



The alleged human footprints (foreground) and dinosaur tracks

The Paluxy River tracks were discovered in 1908, after a flood broke away a layer of rock that had hidden them. Most were clearly the footprints of huge animals, but there were other impressions in the ground—also huge—that bore a resemblance to human footprints. No one paid much attention to the tracks until they became a tourist attraction during the Depression, when people in the area started prying them out of the ground and selling them. At least one enterprising local created his own fossils by carving tracks into softer rocks and passed them off as the real thing.

In the fall of 1938 a paleontologist named Roland T. Bird, of the American Museum of Natural History in New York City, stumbled across some of the phony dinosaur tracks. Although he could see they were fakes, they were accurate enough that Bird felt certain they had been copied from real tracks. He followed his hunch to the Paluxy River basin, where, sure enough, he found dozens of dinosaur tracks. This was a major find, and Bird took about twenty of the tracks back with him to the American Museum of Natural History, where they remain on display today. For years afterward, Bird studied the tracks around the Paluxy River, publishing his work in magazines such as *Natural History*. He believed that the dinosaur tracks were 100 million years old and had been created at a time when the Paluxy River area was the shoreline of a great lagoon. The area was marshy; hence a dinosaur made a deep and, as it turned out, lasting impression in the ground. As for those other impressions, Bird didn't know what had caused them for sure, but he steadfastly denied that they could be accurately labeled human footprints.

It was after Bird's findings appeared in *Natural History* in 1939 that the creationists began pouncing on the "evidence" of the footprints by the Paluxy River. Clifford Burdick, a geologist and dedicated creationist, read Bird's account and decided he had discovered what he was looking for: human footprints that had stood alongside dinosaur tracks. He went to Glen Rose, took photographs, interviewed many of the residents, and over the years wrote numerous articles about the "man-tracks" at the basin. Burdick and the rest of the creationists believe that the tracks were made not 100 million years ago but only 4800 years ago, at the time of Noah's flood. (The flood is what made the ground muddy, in this view.) It's been 32 years since Burdick published his first article, but his work is still referred to in creationist texts, and his original photographs are used as evidence for claims of human footprints in the Paluxy.

Today, creationists continue to explore the Paluxy basin for human footprints and continue to claim that they are finding them. An ongoing expedition is led by Carl E. Baugh, a Baptist minister from St. Louis. Working with a bulldozer, an air hammer, and crews of volunteers, Baugh claims to have uncovered 98 dinosaur tracks, 29 human tracks, 1 human handprint, and 6 big cat prints. "This evidence is devastating to evolution," he says. "We know the Lord would like this exposed as quickly as possible."

Have Baugh and Burdick and others like them really found human footprints? Hardly. It is difficult even to see the shape of a foot in many of them. One speaker in a creationist

film called *Footprints in Stone* blames erosion: “It doesn’t take long after a track is exposed before it becomes almost unrecognizable in just a few years.” (Curiously, the three-toed dinosaur tracks are still quite recognizable.) A number of the impressions are extraordinarily large and lack features like toes and heels. Creationists explain the latter phenomenon by saying the people who made the prints wore moccasins; they explain the former by citing the Bible: “There were giants in the earth in those days.” Baugh, in fact, thinks he has enough evidence of giants to designate them a new genus. *Humanus bauanthropus*, he calls them. Yet whenever scientists have studied the tracks by the Paluxy River, they have come away wholly unconvinced.

One such scientist is SMU paleontologist Bob Slaughter, who about fifteen years ago was asked for his opinion of the man-tracks by a group of creationists. They showed him a number of implausible pits in the rock—“Any little smudge they called a human footprint”—before reaching one that looked possible. It had the right shape and size, but no toes. When Slaughter pointed that out, they gave him the moccasin excuse. Slaughter followed the marks, and soon they led to a larger footprint that Slaughter recognized. “This is the heel print of a camptosaur,” he said. As he recalls it, “They said, ‘No, he’s going that direction and he’s going under the rock over there,’ and so on. It was clear they didn’t want identification, they were just after authentication of what they thought was there. About a year later I was back in the area with a graduate student and I took him over to show him this ‘man-track.’ We went to the very same one, and now it had toes. Somebody had put human toes on that track.”

Another Texas paleontologist, Steven Schafersman, has studied Baugh’s findings, and he is convinced that there is nothing even close to a human footprint in the bunch. He and other paleontologists, anthropologists, and geologists who have looked at the so-called man-tracks think they were caused by exposure, dinosaurs, or subsurface erosion. “The majority of the prints,” Schafersman says, “are due to erosion—scoured depressions, parallel to the river, in a variety of shapes, sometimes showing ‘toes.’ ”

My own inspection of the man-tracks leads me to the same conclusions as Schafersman. Most of them bear very little resemblance to any footprint made in mud. The contours of the arch are either wrong or missing, the toe prints don’t look like real toe prints, individual tracks are often far away from other tracks, and tracks in supposed sequence often show a stride that is downright bizarre for a human in a hurry on slippery mud. As a local man-track guide (yes, they’re still a tourist attraction) said, “You just kinda have to use your imagination.”

One of the great evolutionist hoaxes—the famous Piltdown hoax, in which a faked skull was passed off as the missing link in man’s evolution from the apes—was described by Harvard biologist Stephen Jay Gould as “the imposition of strong hope upon dubious evidence.” That, in the end, appears also to be a good description of what the creationists are doing in the Paluxy River basin.

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These 120,000 year old offer early evidence of humans in Arabia

[ANN GIBBONS](#)

- One day about 120,000 years ago, a few humans wandered along the shore of an ancient lake in what is now the Nefud Desert in Saudi Arabia. They may have paused for a drink of fresh water or to track herds of elephants, wild asses, and camels that were trampling the mudflats. Within hours of passing through, the humans' and animals' footprints dried out and eventually fossilized.
- Now, these ancient footsteps offer rare evidence of when and where early humans once inhabited the Arabian Peninsula. "These are the first genuine human footprints of Arabia," says archaeologist and team leader Michael Petraglia of the Max Planck Institute for the Science of Human History.
- The Arabian Peninsula has long been considered the obvious route that early members of our species took as they trekked out of Africa and migrated to the Middle East and Eurasia. Stone tools have suggested ancient humans explored the Arabian Peninsula at various times in prehistory when the climate was wetter and its harsh deserts were transformed [into green grasslands](#) punctuated with freshwater lakes. Yet so far, researchers have only found [a single human finger bone](#) dating to 88,000 years to prove modern humans, rather than some other hominin toolmaker, lived there.
- After a decade of scouring the Arabian Peninsula using satellite imagery and ground truthing, Petraglia and his international colleagues have identified tens of thousands of ancient freshwater lakebeds, including one in the Nefud dubbed "*Alathar*," meaning "the trace" in Arabic. Here, they spotted hundreds of footprints on a heavily trampled lakebed surface, which had recently been exposed when overlying sediments eroded. Almost 400 tracks were left by animals, including a wild ass, a giant buffalo, elephants, and camels. Only seven were confidently identified as human footprints. But by comparing the size and shape of these tracks with those made by modern humans and Neanderthals, the researchers conclude [the tracks were likely made by people with longer feet, taller stature, and smaller mass](#): *Homo sapiens*, rather than Neanderthals, as they report today in *Science Advances*.
- The age of the sediments also suggests *H. sapiens* made the tracks, the researchers say. Using a method called optically stimulated luminescence, which

measures electrons to infer when layers of sediment were last exposed to light, the team dated the sediments above and below the footprints to 121,000 and 112,000 years.

- At that date, "Neanderthals were absent from the Levant [Middle East]," says co-author Mathew Stewart of the Max Planck Institute for Chemical Ecology. "Therefore, we argue that *H. sapiens* was likely responsible for the footprints."
- A lot rests on the dates, however. Geochronologist Bert Roberts of the University of Wollongong notes some uncertainties with dating methods at the site—including older ages for animal fossils and potential issues with calculating the precise rate of decay of uranium in the sediments. The dates for the footprints "might be in the right ballpark," he says, "but more could be done to validate them."
- The team can't entirely exclude Neanderthals, says paleoanthropologist Marta Mirazón Lahr of the University of Cambridge, because the fossil record is so spotty in Arabia. But she thinks *H. sapiens* is the more likely candidate.
- Even more intriguing, she notes, the footprints show the humans were capable of moving long distances between Africa and Arabia and must have had fairly large foraging parties to have been able to penetrate deep into the rich interior wetlands of Arabia.
- The rare association of human and animal footprints laid down in the same day or so also offers a rare glimpse of a day in the life of an ancient human. Usually, animal and human fossils found in the same fossil bed were buried hundreds, if not thousands, of years apart and never laid eyes on each other. "These footprints give us a unique snapshot of the humans living in this area at the same time as the animals," says paleoanthropologist Kevin Hatala of Chatham University in Pittsburgh, an expert on ancient footprints. "That tight association in time is what's so exciting to me."

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A Russian "Paluxy?"

[Draft] ©2006-2008, Glen J. Kuban (Updated Sept. 2008, Jan. 2008, May 2007)

Part of Kuban's [Paluxy web site](#)

Since the early 1980's unconfirmed reports have circulated that human footprints occur alongside dinosaur tracks in Turkmenistan (formerly part of the U.S.S.R) in

central Asia, near the Usbekistan border. One report appeared in the English version of *Moscow News* in 1983 (No. 24, p. 10). However, I have not been able to locate the original report, or any photographs that might have accompanied it. The article quoted Professor Kurban Amanniyazov, leader of an expedition to the site, as commenting that there were not enough grounds to state with certainty that the prints were human, noting that the site contained "imprints resembling human footprints" but that they had "to date have failed to determine, with any scientific veracity, whom they belong to."

A 1996 *Creation* magazine article by Russian geophysicist Sergei Golovin, reproduced as an [AIG website article](#), reported that the 31 January 1995 edition of the Russian newspaper *Komsomolskaya Pravda* stated, "Human footprints lie alongside thousands of dinosaur prints on a Turkmenian plateau." The author of the article, journalist Alexander Bushev, reportedly traveled to the tracksite near the village of Khodja-Pil Ata in Turkmenistan, and had seen the fossilized prints of dinosaurs and humans together.

According to Golovin, who has not personally visited the site (Golovin, 2006), Bushev indicated that the half-kilometer wide rock bed contained over 3000 three-toed dinosaur tracks, considered by Turkmenian scientist Kurban Amanniyazov to be at least 200 million years old (which would place them near the boundary between the Triassic and Jurassic periods). Golovin's article quoted Bushev as stating 'But the most mysterious fact is that among the footprints of dinosaurs, footprints of bare human feet were found!'

Despite these claims, Golovin's article did not include any photos or scientifically rigorous descriptions of the alleged human tracks, in terms of their specific size, clarity, shape and contour details, or stride patterns. Nor have any of the other creationist authors who repeat or encourage the human track claims.



Turkmenistan dinosaur trails. Photo courtesy of Stantours.com.



Turkmenistan dinosaur track shown at www.stantours.com website.

Amanniyazov himself authored a scientific paper describing the Turkmenistan Tracks, noting that there were a number of track sites in the area, with the main site contained 35 recognizable trackways, involving 1365 individual traces. These he attributed to three different types of bipedal dinosaurs, and indicated that the track beds were late Jurassic, not late Triassic (about 50 million years younger than earlier reported). Curiously, no mention is made of human like tracks until the end of the paper, where (based on the English translation), Amanniyazov writes, "One more thing should be pointed. It's track that has a resemblance of a print of some human being. It is not clear, but is easy for distinguishing. There are not enough scientific reasons yet to confirm that its a human being's, but the investigations are still going on" (Amanniyazov, 1985). If the translation is reasonably accurate, this appears to imply that unlike earlier reports referring to multiple "human tracks" or clear human tracks, there was only one indistinct human-like track. The meaning of "easy for distinguishing" is uncertain--since the human track was already called "not clear" perhaps the author simply meant that it was unlike the nearby types of dinosaur tracks. However, he did not include a photograph of the print in question, nor indicated where on the site it was located, or even if it is on the main site. Thus, it remains uncertain as to exactly what Amanniyazov had seen.

The Turkmenistan tracks were subsequently studied and further documented by American scientists (Meyer and Lockley, 1996; Lockley and Meyer, 1997). Their expedition was sponsored by the National Geographic Society, whose November 1996 magazine featured a brief summary of the site, including two photos--one of the site from a distance, another a close-up of an individual track (Weintraub, 1996). No mention was made of human-like tracks. The scientists more detailed scientific papers on the tracks included diagrams of the trails on the main site, and photographs of some of the better specimens, most which are attributed to the ichnogenus *Megalosauripus*. Several of the figures from these papers are reproduced (with Spanish text) at the para Samber Mais ["megalosauripus" website](#). Based on ammonite index fossils, the authors affirmed the late Jurassic (Oxfordian) age of the track beds, dated at approx. 155 million years (Lockley and Martin, 1997). Their paper does not indicate the total number of tracks, but recognized 34 trackways, including some of the longest dinosaur trackways known, with the three longest extending for 226, 266, and 311 meters. The authors do not mention any human-like tracks, but indicate that some of the tracks are "elongated and long heeled" and up to 70 cm in length (Meyer and Lockely, 1977). Elongate dinosaur tracks, especially metatarsal forms that were indistinct, infilled, or mud-collapsed, have been mistaken for "giant human tracks" (Kuban, 1986) in the past. However, Lockley indicates that the elongate tracks in Turkmenistan do not show metatarsal impressions, but are simply longer than wide, and not particularly human like (lockley, 2006).

A number of travel-guide websites also mention the dinosaur tracks in Turkmenistan, as one of several attractions near the beautiful Kugitang Mountainside and "Dinosaur Plateau," part of the Kugitang Nature Reserve. Some even show a photo of some of the tracks, although some give the number of tracks as 428 -- considerably less than other sources. of them occur there (in contrast to the 3000 tracks indicated by Golovin). Perhaps they were referring to the number of clear tracks. At any rate, as far as I have been able to determine, this is the same locality (or at least general area) as the one containing the alleged human tracks, and yet again, none mention or show any human prints there.

If the human track supporters believe that the American scientists, travel companies, and numerous visitors overlooked or neglected real human tracks, or were engaged in some kind of conspiracy or cover-up, documenting the prints in question should not be difficult. Indeed, several travel agencies offer tour packages that include a visit to the site.



Track shown at Jeff Brenner's website. Presumable from the Turkmenistan site.

Until 2007, the only track photograph I was able to locate in connection with this site that is even remotely humanlike in shape was shown in an article about the Turkmenistan prints on a website (removed in 2007) by strict creationist Jeff Brenner (Brenner, 2006). The article did not indicate the source of the photo, or even clarify whether it is from the Turkmenistan site. The photo did not show a clear human track, but rather an elongate depression with what appears to be significant anterior splaying and more of a three-toed than 5-toed human pattern at the front. There is no discernible ball-arch-heel pattern on the print bottom, and overall, it appears at least as compatible with a metatarsal dinosaur print as a human print. Unfortunately, if it is the former, the far anterior end which might show more indications of a dinosaurian digit pattern is probably cut out of the picture.

More recently strict creationist Dennis Swift promoted the Russian "man tracks" on his ["Dinosaur and Humans" web page](#) . After suggesting that apparent human tracks occur at the "controversial Paluxy sites" in Texas, Swift states that, "... there are several other locations in the world where what appears to be human and dinosaur footprints are also found in close proximity to each other, or even inside of one another. One such place is Turkmenistan, a former Soviet Union republic. Giving his affiliation as "The Dinosaur Insititute", Swift states that he was invited by the Turkmenistan government and Academy of Science of Turkmenistan to investigate the Koughitang-Tau dinosaur sites, and that "Dr. Swift received permission to conduct many tests and make latex molds of the dinosaur and human footprints. Professor Halmuad Kudajkulijev of the Institute of Geology and Turkmenistan Academy of

Science accompanied Dr. Swift. The expedition also included Hemra Duridijev, Ishkabulov Nuriddin, and Narbayev Hudayhazar." However, Swift provides no diagrams of the alleged human trails, and his photos only show a few ambiguous depressions, that do not provide any convincing evidence of human footprints.

Several of the photos were taken with someone's foot placed over or inside the depression, obscuring most of the track features, including all of the bottom contours. The few photos that show exposed depressions either show obvious dinosaur tracks, or are of poor quality and do not show clear or convincing human features. In 2005 - 2006 Swift's website showed only three close-ups of supposed human tracks, but they all appeared to be the same marking as in the Brenner photo above--with different color renderings, and different orientations. On Swift's page the photos are shown in a horizontal position and two involve negative flipping (presenting reverse images of the other photo versions). In other words, the same photograph is shown three different ways on Swift's page, and yet another way on Brenner's page. In 2007 Swift's website included a few more alleged "human" track photos, but the markings appear to be largely defined by the liquid used to moisten the surface, rather than any significant or contours in the rock itself. Even with such highlighting, the shapes are not natural or anatomically correct, and lack normal human bottom contours. Swift also shows "laytex" [sic] molds of a "human" and dinosaur track; however, the former looks considerably more well defined than the supposed human prints in the tracksite photos, and none of the photos show striding sequences of human like tracks. The recent individual images on Swift's site are programmed so that they cannot be linked to or downloaded, but one can visit the relevant web page [here](#). At an [anonymous report](#) at Swift's website entitled Walking



Photo from Dennis Swift's "Human and Dinosaur" website

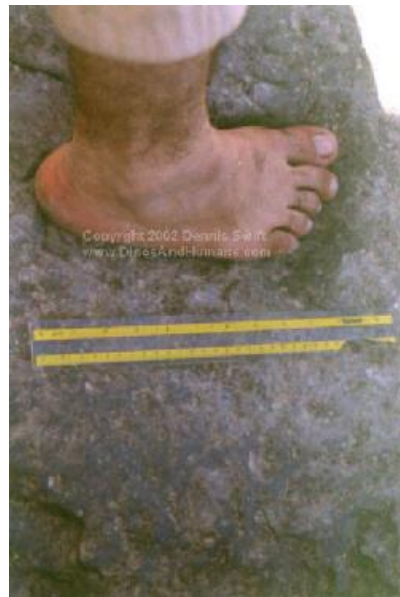


Photo from Dennis Swift's "Human and Dinosaur" website
Evidently there is supposed to be a human print under the person's foot

With Dinosaurs also claims that clear "goat tracks" were found on the site, but no photos or diagrams were presented to support this assertion.

Another strict creationists who promotes the Russian "man tracks" and "goat tracks" is Jeff Benner, who implies on his website that such tracks have been well documented, but as evidence only shows are a few of Swift's dubious photos. Benner suggests that no scientists have refuted or even addressed the Russian "human footprints", so they must be genuine. In 2006 I wrote to Benner informing him of this article; in his reply he indicated that he would correct his website accordingly. However, as of late 2008, his same claims are still at his website.

In view of the fact that elongate dinosaur tracks and other non-human phenomena that have been mistaken for human footprints in the past, ([Kuban, 1986](#)), and the lack of rigorous documentation by the human track advocates, Golovin's suggestion that the those who do not accept the human track claims suffer from "evolutionary indoctrination" rings hollow. Likewise, when Benner suggests that the human track claims seem convincing simply because evolutionists have not disproved them, he seems to misunderstand the nature of science. When extraordinary claims are made, the burden is on the claimants to back them up. Without rigorous documentation of the alleged human tracks, what does Benner expect the scientists to address? They've described and documented the dinosaur tracks, and so far the humanoid track proponents have presented no substantial evidence that human or even very human-like tracks occur at the site. Indeed, even major creationists groups have refrained from endorsing the claims. For example, "Answers in Genesis" tempered Golovin's remarks by noting that "one needs to be cautious about accepting the prints described on the basis of just this report. None of our sources has been able to obtain any further information on the prints, nor any photographs to this date." (AIG website, 2006).

Conclusions

Alleged human or human-like prints alongside dinosaur tracks in Turkmenistan have not been rigorously described or documented. In view of this, and the extensive evidence that millions of years separate non-avian dinosaurs from humans, the tracks in question cannot be regarded as reliable or even probable human prints.

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For more information see: paleo.cc/paluxy.htm

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Retrieved July 19, 2022 from [Russian "man tracks?" \(paleo.cc\)](https://paleo.cc/paluxy.htm)

Stunning footprints push back human arrival in Americas by thousands of years

The tracks at New Mexico's White Sands National Park are upending past assumptions on when humans first ventured into North and South America.

BY MAYA WEI-HAAS

PUBLISHED SEPTEMBER 23, 2021

• 14 MIN READ

The footprints look like they were left behind just moments ago by a barefoot visitor to New Mexico's White Sands National Park, the amblings of a slightly flat-footed teen, each toe and heel impression crisply defined by a fine ridge of sand.

But this is no tourist track. These prints are among the oldest evidence of humans in the Americas, marking the latest addition to a growing body of evidence that challenges when and how people first ventured into this unexplored land.

According to a [paper published today in the journal Science](#), the footprints were pressed into the mud near an ancient lake at White Sands between 21,000 and 23,000 years ago, a time when many scientists think that massive ice sheets walled off human passage into North America.

Exactly when humans populated the Americas has been fiercely debated for nearly a century, and until recently, many scientists maintained this

momentous first occurred no earlier than 13,000 years ago. A growing number of discoveries suggest people were in North and South America thousands of years before. These include the Monte Verde site in Chile that's [as old as 18,500 years](#) and the Gault site in Texas that's [up to 20,000 years old](#). But each find kicks up a firestorm of controversy among scientists.

While the White Sands discovery doesn't close the book on these debates, it is stirring excitement.

"A discovery like this is very close to finding the Holy Grail," says [Ciprian Ardelean](#), an archaeologist with the Autonomous University of Zacatecas. Ardelean directs excavations at Mexico's Chiquihuite Cave, where researchers believe they have evidence for human activity in the [Americas as early as 30,000 years ago](#).

"I feel a healthy but profound envy—a good kind of jealousy—towards the team for finding such a thing."

The footprints of ghosts—or Bigfoot?

Footprints preserved in the boundless expanses of White Sands have drawn the attention of scientists since the early 1930s, when a government trapper spotted a print measuring a stunning 22 inches long and eight inches wide. He was convinced he'd found evidence for the mythical Bigfoot.

"In a sense, he was right," says [David Bustos](#), the park's resource program manager and an author of the new study. "It was a big foot—but it was a big foot of a giant ground sloth and not a human."

Since then, careful study has uncovered thousands of tracks in the national park, providing [snapshots of ancient humans and now-extinct animals](#) like giant sloths and mammoths that wandered across the lands near ancient Lake Otero, a [1,600-square-mile](#) body of water that dried up some 10,000 years ago. Each imprint was cast and bound millennia ago in gypsum-rich sand whose pale color gives the park its name. Some are eventually exposed by winds whipping across the dunes but quickly

weather away in the elements. Other prints, hidden beneath the sand, are visible only to the trained eye as faint shifts in color at the surface at rare times when the ground is not too wet or dry.

These ephemeral appearances have earned the nickname "ghost tracks." Each footprint marks the place where an ancient relative once stood thousands of years ago.

"[It] just gives us goosebumps," Kim Charlie, a member of the [Pueblo of Acoma](#), says of visiting the site. Many Native American tribes and pueblos feel a spiritual connection to White Sands, and Charlie is part of a committee in the [Tribal Historic Preservation Office](#) that's been collaborating with the research team to ensure the prints' preservation.

Pinning down exactly when the track-makers pressed their toes into the mud at White Sands, however, has proven challenging, says study author [Matthew Bennett](#), a geologist at Bournemouth University in England. The park's surfaces are a palimpsest of crisscrossing trackways that could have been created in separate events thousands of years apart. To securely date a print, researchers must find layers of seeds that can be dated using radiocarbon analysis, below and above layers of footprints. This way scientists can determine the earliest and latest moments in time the horizon of prints were laid down. But season after season, their search for a site with both seeds and footprints was unsuccessful.

Then came the fateful day in September 2019 when Bustos and Bennett returned to a bluff in the park they had visited more than a dozen times before. They knew the site harbored ancient seed deposits, but they hadn't yet found human footprints. On this day, however, wind had uncovered a set of unmistakably human prints that ended in a mound of sand. Scraping off the upper sandy layer revealed the ghostly outlines of a buried track.

"At that point, we said Bingo, we've got it," Bennett recalls.

A team of archaeologists, geologists, dating experts, a geophysicist, and a data scientist assembled to study the site, which spans an area roughly

the size a half basketball court, with a battery of tests. Excavation revealed eight separate horizons of footprints, which contained 61 human tracks left by up to 16 people, mostly teens and children. Multiple track layers were bookended above and below by layers of sediment containing seeds from the *Ruppia* grass.

Radiocarbon dating of the seeds suggests humans and animals trekked across this same grassy route for at least two millennia, from 21,000 to 23,000 years ago. Bennett cautions that the date only applies to the footprints at this one location, and the dates remain unclear for the many other tracks at White Sands. But the early age of the site is a bombshell find—and the team is acutely aware of the boldness of the claim.

"We've really tried to prove it's not that old, and we keep coming up dry," says [Daniel Odess](#), an archaeologist and Chief Scientist for Cultural Resources with the National Park Service and an author of the new study.

The wall of ice

While the latest evidence for an early human presence in the Americas comes from footprints in the desert, the bigger debate on when we arrived centers around ice. As the world entered the Last Glacial Maximum (LGM), which spanned roughly [20,000 to 26,500 years ago](#), temperatures decreased and growing glaciers locked up an increasing volume of water, sending sea levels plummeting more than [400 feet lower](#) than they are today. Many land features emerged from the waves, including what is now known as Beringia, a natural bridge connecting modern Siberia and Alaska that researchers believe provided a clear route for humans to make their way into the Americas.

But as temperatures during the LGM dropped, a pair of massive ice sheets—known as the Laurentide and Cordilleran—advanced across what is now Canada, forming a near-continuous icy wall from the Atlantic to Pacific oceans perhaps [as early as 23,000 years ago](#). Many scientists have argued that humans couldn't have made inroads south into Canada until after the ice sheets retreated.

Since the mid-1900s, the threshold for these first migrations was set at [13,000 years ago](#), with the rise of the Clovis culture, a group known for their distinctive stone tools. Many scientists now accept that humans entered the Americas starting [roughly 17,000 years ago](#), perhaps traveling down [routes along the Pacific coast](#) that became passable before the icy continental interior melted.

But White Sands stands among the few sites suggesting that humans were already in North America at the height of the LGM. With the discovery announced last year that suggests people may have been present in [Mexico's Chiquihuite Cave as early as 30,000 years ago](#), critics of the Chiquihuite study question whether humans or geology fractured the rocks.

This is a concern that has plagued many of the pre-Clovis sites, but there's no doubt the White Sands track-makers were human: "It's just screamingly obvious," says study author [Vance Holliday](#), an archaeologist and geologist at the University of Arizona.

What's more, there isn't just one set of prints at White Sands, but multiple layers of human activity dated to earlier than 20,000 years ago. "If you don't like one layer, okay that's fine, here's another one," Bustos quips. "If you don't like that, well here's another."

Old carbon, new carbon

Some scientists still question the reliability of the dates for the footprints obtained by the research team. [Loren Davis](#), an archaeologist at Oregon State University, stresses the need for a second dating method to verify [the radiocarbon results](#), pointing to the phenomenon of what's known as a hard water or [freshwater reservoir effect](#) that can muddy radiocarbon dates.

This happens because aquatic plants, like the *Ruppia* grass analyzed from White Sands, draw carbon from compounds dissolved in their wetland environment. If "old" carbon—such as carbonate rock—is present, the plants will incorporate it into their bodies, which can in turn result in deceptively old radiocarbon dates. Land plants, however, don't suffer from these effects, since they draw carbon from the

atmosphere, where the relative amounts of radioactive and non-radioactive carbon are fairly constant. The team studied the potential for a freshwater reservoir effect, concluding they were likely negligible.

While the evidence the team presents can't prove such an effect is absent, it does suggest any potential impacts are fairly small, says [Bente Philippsen](#), a radiocarbon specialist at Aarhus University who was not part of the study team. Philippsen adds that most freshwater reservoir effects are on the order of hundreds—not thousands—of years. "The most severe effect I have measured is a couple of thousand years," she says. "Even if we assume [the reservoir effect] would be as bad at the White Sands site, still it wouldn't change the conclusion that this stuff is more than 20,000 years old."

[Thomas Stafford](#), a geochronologist with Stafford Research in Colorado who was not part of the study team, agrees on the reliability of the dates, and comments on the thoroughness of the study. "This took a long time and was really, really well done."

Additional confirmation of the dates may be tough to obtain. The team attempted to use a method involving uranium, but the samples were not well suited for the analysis, explains [Jeff Pigati](#) of the United States Geological Survey, who studied the plant remains. Davis points to other techniques, such as optically stimulated luminescence, which could help confirm the timing. But Stafford adds that OSL can have very large standard deviations, so may not provide a tidy confirmation. Yet the team is still working to perfect their methods of uranium dating and to obtain OSL dates for additional confirmation.

"I, for one, will be very excited if this is true," Davis says. But he adds, "I just think it's premature for us to get the champagne out and say it's been done, we've nailed it."

Re-thinking early humans

The reason for such a close eye on these numbers is because, if confirmed, the discovery of people in the Americas during the last glacial maximum would require a fundamental shift in scientific thinking about how people arrived in the New World. Did they sneak

through inland routes before the glacial doors slammed shut during the LGM? Did they boat around icy areas of the coasts?

"More importantly, it actually requires us to think about how we do archaeology," Davis says, "because no one is looking at 22,000-year-old deposits."

In the past, Stafford says, scientists have sent him excavated material to radiocarbon date and requested he stop analyzing once he reached material 13,000 years old. Now that cutoff is closer to 18,000 years, he says, but such hard lines may have blinded past research to even older discoveries. "If you're not looking for anything, you're not going to find it," Stafford says. "So, therefore, there are very few sites."

Ardelean hopes that the White Sands work will help inspire current scientists as well as future generations of students, to take another look at early human movements through the Americas. He's dismayed at how the intense controversy has dissuaded many of his past students from continuing to study American prehistory.

But after decades of the field centering around a Clovis culture of only 13,000 years ago, change may finally be on the horizon. "I think we will not speak in terms of pre-Clovis possibilities," Ardelean says. "We will speak in terms of pre-White Sands and post-White Sands."

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