

# GIANT SLOTHS

## ANCIENT CAVE-MAKING MACHINES

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**I**N SOUTHERN Brazil, hundreds of massive openings in the ground, connected by tunnels, dot the landscape. They are so numerous that the locals took them for granted. No-one thought to ask where they came from or what made them. However, scientists have recently presented a surprising answer; the entity responsible for these caverns was likely *Megatherium americanum*, an extinct species of giant ground sloth.



**Fig. 1.** Artistic impression of *Megatherium americanum* digging a tunnel

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### Tunnels are not natural caves

It's no surprise that the tunnels in Brazil fooled many into believing they were just cave systems.<sup>1</sup> At first glance, they appear to be just that; caves with a large opening and tunnels running from one opening to another. Upon further inspection, however, scientists realized that these caverns are in fact ancient burrows (*paleoburrows*) dug by extinct megafauna (large animals)—figs. 1 & 2.

The first indication of them not being carved by physical/geological processes was the realization that their walls are fairly consistently rounded throughout and the floors level and smooth. Natural cave systems are usually formed by running and dripping water, which results in very uneven walls and floors.<sup>2</sup>

The tunnels also have a series of rounded, upward bulges in the ceiling—consistent with a large animal strenuously digging, resting, then resuming (figs. 2 & 3). Many have prominent marks of 'claw excavation' still visible on the tunnel walls and formed ceilings.

These giant burrows are round or elliptical in cross-section. They can be about 2 m (6 ft) high and 1–1.5 m (3–5 ft) wide (after factoring in enlargement from subsequent erosion). And they can be of considerable length. One of the largest known is some 600 m (2,000 ft) long,



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Franker et al. 2012. Cenozoic vertebrate tunnels in southern Brazil. In: *Ichthyology of Latin America, selected papers*. Monografias da Sociedade Brasileira de Paleontologia, v. 2, p. 141-158.

**Fig. 2.** One of the characteristic (see fig. 3) ‘scalloped’ burrows

**Fig. 3.** Schematic diagram (not to scale) by Renato Pereira Lopes, 2007, of the stepwise construction (1 to 4) and the final shape (5) of a tunnel (fig. 2), in vertical sections parallel to the tunnel axis

1. Animal digs the first section and removes the unearthed material.
2. Animal stops digging for a while.
3. Animal digs the second section and cleans the tunnel.
4. Animal continues the steps of digging, cleaning and pausing until the completion of the tunnel.



5. The final shape of the tunnel can be called "successive-excavation-steps shape"

counting all its side-branches. It's estimated that some 4,000 tonnes of dirt and rock had to be dug out to make this particular burrow system! It was evidently made by many individuals over several generations.

### Crossing the Bering Land Bridge

The Ice Age was a natural consequence of Noah's Flood. Volcanism and tectonics added a lot of heat to the oceans, which caused evaporation. This came down as snow and so vast amounts of water were locked up as ice at high latitudes, meaning sea levels were considerably lower. This caused land to appear that would later be once more covered by ocean.<sup>3</sup> In those early post-Flood centuries, Siberia was linked to Alaska for a time via the Bering Land Bridge ('Beringia'). People migrated over this land bridge from Asia to the Americas, likely after many animal species had already done so. That included the descendants of the pair of what was likely only one sloth kind on the Ark.<sup>4</sup> Their later descendants likely form the suborder Folivora (meaning 'leaf-eaters').

Once in the Americas, sloths continued to spread out and diversify, adapting to differing environments.<sup>5</sup>

Eventually, there were small, tree-dwelling species and giant, ground-dwelling species on both continents. Some even

migrated to islands in the Caribbean (four species in the family Megalocnidae, all now extinct). The other 20 sloth species have been divided into two superfamilies. Strangely, each of these two groups contains both arboreal (tree-dwelling) sloths and ground-dwelling sloths (some gigantic, others much smaller).

Today, only seven sloth species remain, all of them tree-dwelling. Five of these species are three-fingered sloths (genus *Bradypus*, meaning 'slow-footed') and two are two-fingered sloths (genus *Choloepus*, meaning 'lame-footed'). Both genera (singular = genus) are also in different families. All seven species live in the northern half of South America and/or southern Central America.

The extinct species thought to have dug those massive caves (*M. americanum*) inhabited South America. Evidence shows that their range extended from southern Ecuador down to central Chile and Argentina, and eastward to southern Brazil. It covers the territories of eight different modern countries.

### Giant mammals with giant claws

This enormous creature was able to stand and walk on its hind legs. *M. americanum* was the largest bipedal<sup>6</sup>



**Fig. 4.** Las Dantas panel at Cerro Azul, Columbia (arrow points to proposed giant sloth painting)



**Fig. 5.** A giant sloth vertebra found in the Peace River near Arcadia, Florida, by CMI scientist Dr Robert Carter. The fossil is about 15 cm x 12 cm x 10 cm (6" x 5" x 4"), which is much larger than any of your back bones!

Image supplied by Robert Carter

### Omnivorous surprise

The giant ground sloth had an incredible reach of over 5 m (17 ft), which meant it could have easily accessed fruit and leaves high up in trees. This fostered the long-held belief that the giant sloth was vegetarian, like its modern, smaller, tree-dwelling cousins. Yet there is evidence that a somewhat smaller giant ground sloth, *Mylodon darwini*, was an omnivore like humans. This conclusion came from testing the nitrogen isotopes in its bones.<sup>9</sup>

Finding examples of both herbivores and omnivores within the same animal kind should not surprise creationists, as we see many examples of this today.<sup>10–12</sup> It can readily be explained by the consequences of Adam’s sin and the corruption of God’s creation, as revealed in Genesis. In the beginning, all living creatures were vegetarian (Genesis 1:29–30) until some time after the Fall of mankind. We know from the fossil record that animals began to eat meat before the Flood. It wasn’t until after this global catastrophe that God gave *people* permission to eat meat (Genesis 9:3).

### Hunted to extinction

Humans driving animals to extinction through over-hunting is not a new story for many long-gone animals. Some of the most famous examples include the dodo (*Raphus cucullatus*) and the thylacine (a.k.a. the Tasmanian tiger, *Thylacinus cynocephalus*). The butchered remains of a giant ground sloth were recently found in Argentina.<sup>13</sup> Pendants carved from the bones of these megafauna have also been found,<sup>14</sup> as have petroglyphs (rock carvings) depicting the animals alongside humans (fig. 4).<sup>15</sup> Such evidence has caused many scientists to point to humans as the reason for the demise of this and other large creatures, rather than changing climate associated with the Ice Age.<sup>16</sup>

mammal of all time. It weighed over four tonnes and had a standing height of more than 3.5 m (12 ft), rivalling a bull elephant!<sup>7</sup>

Combining size with their massive claws, these animals were not only strong enough to tear down large branches but also rip through stone and sediment. This enabled them to dig the massive tunnel systems we see today.<sup>1</sup> Like the claws of other animals, sloth claws have a core of elongated bone covered by a protective layer of keratin (the same as our fingernails). But in sloths the bony component is much larger and longer than most, effectively forming a rigid extension of the digit.<sup>8</sup>

## Created complexity

These remarkable creatures, with their impressive size and unique adaptations, stand in stark contrast to their much smaller and slower extant (still living) cousins. The giant ground sloths dug massive tunnels, literally carving their own niche out of the landscape.

Sloths serve as a testament to the inherent created complexity in each 'kind' that disembarked Noah's Ark. The variety of sloths both living and extinct reminds us of the extraordinary ability that God gave creatures to adapt to a range of environments. All this inspires us to appreciate the intricacies of His creation and to celebrate the divine artistry that brought all creatures into existence. ■

## References and notes

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**Fig. 6.** Skeleton of *Paramylodon harrani*, a species of giant ground sloth  
**Inset:** Size of *Megatherium americanum* compared to a human



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