Google Earth aids discovery of early African mammal fossils

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A limestone countertop, a practiced eye and Google Earth all played roles in the discovery of a trove of fossils that may shed light on the origins of African wildlife.

The circuitous and serendipitous story, featuring University of Michigan paleontologists Philip Gingerich, Gregg Gunnell and Bill Sanders, is the subject of a segment on the award-winning television series "Wild Chronicles," currently airing on public television stations (Episode 412---Looking Back; check listings for local air dates). "Wild Chronicles" is produced by National Geographic Television and presented by WLIW21 in association with WNET.ORG.

The saga began when Gingerich, an authority on ancient whales, learned of a whale fossil from Egypt that had been discovered in a most unconventional way. At a stonecutting yard in Italy where blocks of stone from around the world are sliced up for countertops, masons had noticed what looked like cross-sections of a skeleton in slabs cut from a huge hunk of limestone imported from Egypt. Paleontologist Giovanni Bianucci of the University of Pisa recognized these as fossilized remains of a whale that lived in Egypt 40 million years ago, when the region was covered by ocean.

His curiosity piqued by the discovery, Gingerich wanted to visit the site where the limestone was quarried, but the exact location was something of a mystery. Bianucci had reported that the countertop whale came from a site near the Egyptian city of Sheikh Fadl, but a colleague in

Egypt told Gingerich the quarry was probably farther east---exactly where, he wasn't sure.

Instead of setting out blindly across the desert, Gingerich sat down at his computer and clicked on Google Earth. After locating Sheikh Fadl, he scanned eastward until he found a range of limestone bluffs trailing across the desert like the backbone of some enormous serpent. Continuing his virtual expedition, Gingerich followed the bluffs, looking for roads branching off the main highway that might lead to quarries. Finally, about 75 miles east of Sheikh Fadl, he came across a road that traveled north to a deeply pocked area that just had to be a cluster of quarries.

Through associates in Egypt, Gingerich made arrangements to travel to Khasm el Raqaba, the area he had located on Google Earth. "Sure enough, when we got there, there was a huge quarry operation with trucks everywhere, blasting out blocks of limestone," said Gingerich, who is the Ermine Cowles Case Collegiate Professor of Paleontology and director of the U-M Museum of Paleontology. Within minutes of seeing the site, though, Gingerich realized any whale fossils that might be there would be impossible to locate.

Scanning the scene, however, something else caught his eye: bands of red in the white limestone walls of the quarry. He quickly realized the red bands represented layers of loose soil that were blown into ancient caves.

"Suddenly it dawned on me: There should be animals preserved in that sediment, too, because caves often act as traps," Gingerich said. When he searched at the base of one rock outcrop, there were tiny bones everywhere.

Gingerich collected some of the fossils and took them back to the U-M

Museum of Paleontology where Gunnell, an associate research scientist, began studying them and identified teeth and bones of fossil bats. Gunnell shared the materials with Ellen Miller of Wake Forest University, who found a few rodent jaws and some additional teeth. Recently, with funding from National Geographic Society, Gunnell, Miller, U-M assistant research scientist William Sanders and Ahmed El-Barkooky of Cairo University visited the site to collect more of the fossils, which may have an interesting story of their own.

The bones and teeth---remains of small mammals that lived in the early Miocene Epoch, some 18 to 20 million years ago---are the first small mammal fossils of that age to be found in Egypt. They may even represent some of the first mammals to migrate from Asia to Africa when the land bridge between the two continents first formed.

"It's likely that animals moving from Asia to Africa passed through the Khasm el Raqaba area," Gunnell said. Were the tiny bats, rats and other creatures whose fossils the researchers found among those very first migrants, the progenitors of today's iconic African wildlife?

"The record isn't good enough to pin that down yet," Gunnell said. "But when these animals are studied in detail, they should lead to a better understanding of biogeography and dispersal events between Asia and Africa and between North Africa and the rest of the African continent."

Source: University of Michigan (news : web)