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Tupandactylus navigans from the Early Cretaceous Crato Formation of Brazil.

Image credit: Beccari *et al.*, doi: 10.1371/journal.pone.0254789.

[Exceptionally Well-Preserved Pterosaur Fossil Found in Brazil](#)

Event Coordinator – We have a monthly OSFS newsletter called The Statement. If you would like to be on the e-mail list contact the editor@ottawasfs.ca

Editor's Blather: The article doesn't mention how large this animal was.

“The analysis suggests *Tupandactylus navigans* had a terrestrial foraging lifestyle, due to its long neck and the proportions of its limbs, as well as its large head crest that could negatively influence long-distance flight.

However, the specimen possesses all the necessary adaptation for powered flight, such as the presence of a notarium and a developed muscle anchoring region in the arm bones.”

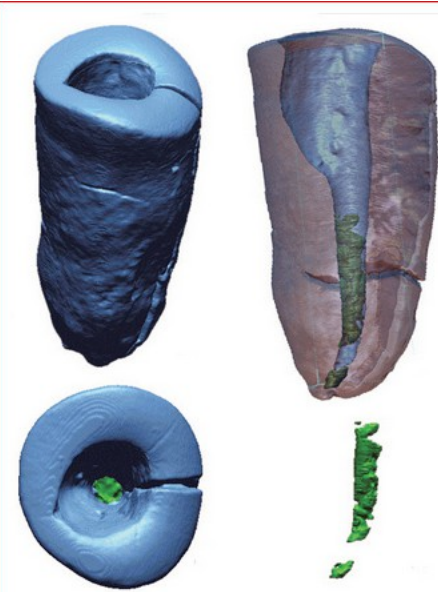
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Odd looking critter isn't it? That huge crest on it's head probably served the same purpose as a birds tail feathers – display and flight steering..

On another gruesome note:

Researchers

working near Lucca in northern Italy have found the oldest example of the practice of filling dental cavities, according to Stefano Benazzi of the University of Bologna. Using microscopic techniques, Benazzi and his team determined that two 13,000-year-old front teeth that belonged to a late Pleistocene hunter-gatherer were manipulated with a



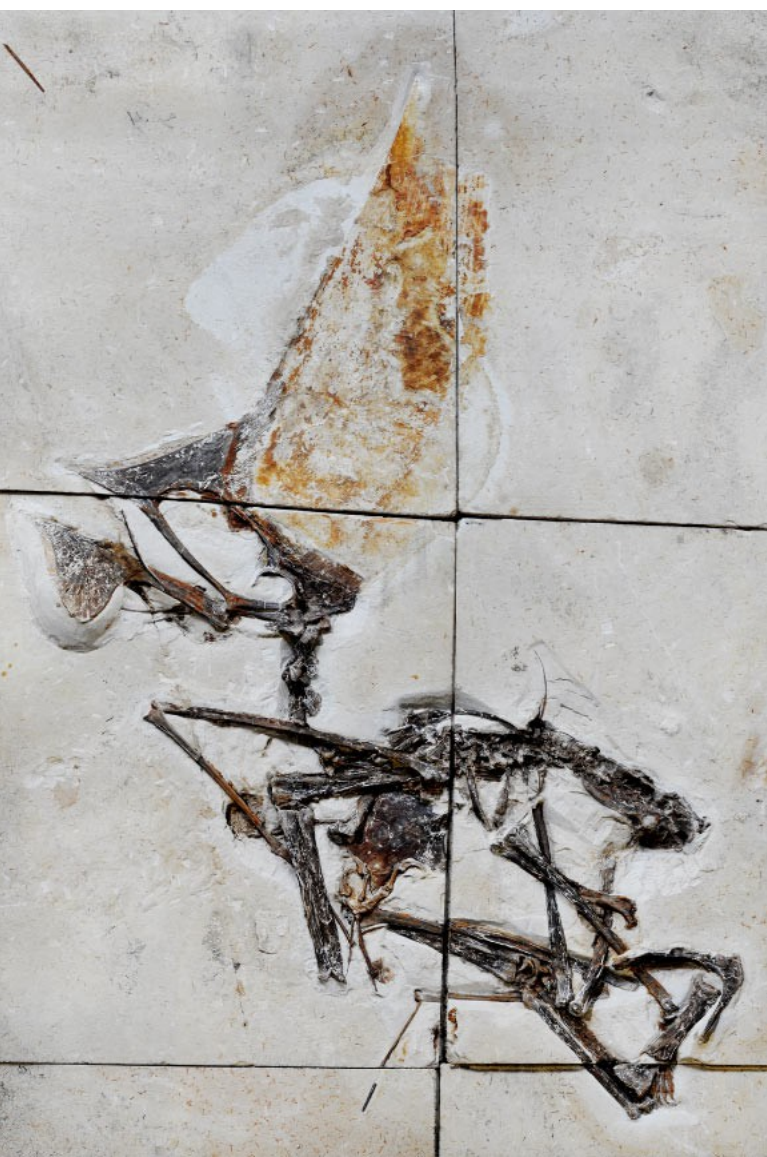
(Courtesy Stefano Benazzi, University of Bologna)

Digital rendering of front tooth

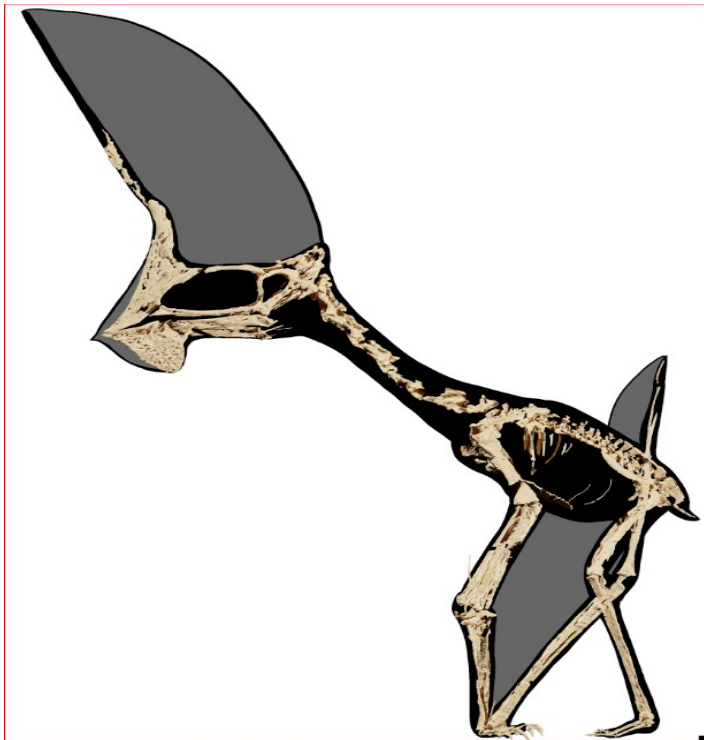
handheld tool. The Ice Age dentist drilled to remove decaying material within the pulp chambers of the teeth and replaced it with a natural antiseptic paste containing bitumen, vegetal fibers, and hair. This new evidence suggests a more sophisticated technology than previous markings that Benazzi and his colleagues found in teeth from another site in Italy, dated a thousand years earlier. Those teeth are believed to be the first known evidence of human dentistry.

By Marley Brown [Not So Pearly Whites](#)

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A nearly complete skeleton of a tapejarid pterosaur that lived during the Cretaceous period.



Sunlit clouds at midnight

Ken Tapping - Jul 23, 2021 / 6:00 am | Story:
340723



Photo: NASA

For us living north of latitude 45 degrees, which includes pretty well all of Canada, summer nights are short, and it does not get really dark.

This is because the sun does not get very far below the horizon. Here in southern British Columbia, at a latitude of around 50 degrees north, the midnight sun lurks a mere 17 degrees or so below the northern horizon. If there are no towns in that direction we can see the glow. If we go to latitude 67 degrees or so, the sun will be on the northern horizon at midnight. Further north, it won't set at all.

This means that if we look northward on a clear summer night around midnight, although we might be in darkness, something high enough in the sky will have the sun shining on it. This makes possible a rare but rather beautiful feature of summer nights, noctilucent clouds. To see these, get to a place without the glare of a town to the north, with a good view of the northern horizon. If they are present you will see a layer of opalescent, lacy cloud, shining with lots of delicate colours, looking rather like a layer of mother-of-pearl.

As is the case with many things in nature, this beauty is produced by something prosaic: low-angle sunlight shining on a layer of ice crystals. However, these clouds are different in that they are made up mainly of material from space.

The clouds we see in the sky almost every day are due to water rising from the ground or sea. The sun warms the sea or land surface, evaporating water. The warm air

rises, carrying the water vapour with it. Eventually it reaches a height where it is too cold for the air to hold all that water, and it starts to condense out, forming a cloud of water droplets. If the column of rising air is vigorous enough, the water vapour can be carried to a height where it is cold enough to freeze the water, forming tiny ice crystals. These form the fibrous clouds we call mare's tails. Since those ice crystals are little prisms, they break up sunlight or moonlight into its component colours, producing sundogs, moondogs and pearly rings around the moon. However, all this happens at a relatively low altitude, below around 20 kilometres. The noctilucent clouds lie around 80 kilometres above the ground. They lie far too high to be formed by wet air rising from the ground. They are made mainly from meteor debris drifting downward.

Our planet is under constant bombardment. On average, around 100 tonnes of meteor debris arrives at Earth each day. Most of this stuff comes from objects the size of gravel, grit or grains of sand entering our atmosphere at many kilometres a second and burning up. This is really the tail end of the process of planet building. Our world and the other planets of the solar system are the result of many small bits of material accumulating into bigger and bigger lumps. The result is very fine dust that remains in the upper atmosphere for a very long time, diffusing only slowly downward. It is a fine mixture of rock dust, metal dust and tiny ice crystals. Once it gets down to heights where rain and snow forms, it gets flushed down to the ground quickly.

There are high-energy ground level phenomena that can send material to a height of 80 km or so. These include volcanic eruptions and nuclear explosions. On occasion, small noctilucent clouds have been seen after launching space vehicles, particularly those using hydrogen and oxygen as propellants, because the exhaust is water, which instantly freezes at high altitude into tiny ice crystals.

Despite their dusty origin noctilucent clouds are beautiful features of some summer nights. They do not occur every night. But if you are away from the manmade light pollution on a clear summer night, and you have a clear view to the north, it is worth keeping an eye on the northern sky. Telescopes and binoculars are not needed, but something to take a picture or two would be a good idea.

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