



Sedgwick Museum
of Earth Sciences

A seasnake in the Thames Estuary 50 miles from London?

Fortunately, the evidence for seasnakes living 50 miles from London in the Thames Estuary is not something to worry about. The single backbone recently found on the foreshore of the Isle of Sheppey is 50 million years old and was washed out of the local London Clay deposits, which are of Eocene age.

The fossil was found by the Curtin family on a fossil collecting trip to Sheppey, a locality which has been well known for its abundant fossils for over 300 years. A number of specimens from the Isle of Sheppey are held in the 18th century Woodward collection, which forms the basis of the Sedgwick Museum's fossil holdings.

At present some 500 fossil plant species, dominated by tropical lianas and the mangrove palm *Nipa*, are known from Sheppey, along with another 350 fossil animal species, ranging from barnacles to birds, from a dog-sized primitive horse called *Hyracotherium* to turtles and a seasnake. Read more:

The Curtin family's fossil finds

The Curtins brought two different fossil backbones into the Museum to be identified (see photographs).



(1)



(2)

The larger (some 40 mm long) and less well preserved of the two can be compared with that of a quite large scombrid fish, a group which includes fast swimming predators such as mackerel, bonito and tuna and was about the size of a tunafish. However, identification of fish species from their backbones is almost impossible and well preserved fossils of teeth jaws and skulls are required. However so many well preserved fossil fish have been found at Sheppey that some 150 fish species have been identified.



(3)

The smaller and better preserved backbone (15 mm long) has a distinctive centrum, the main cylindrical articulating bone of the backbone. One end is concave (cotyle) and the other has a domed convex surface (condyle). In contrast fish and aquatic reptiles have concave ends to the centrum.

Our search for the identity of this fossil concentrated initially on fossil turtles, which after fish form the most common vertebrate remains at Sheppey. Turtle neck vertebrae also have a convex dome to the centrum, which helps flex the neck.



(4)

The Museum's Matt Riley compared the Curtins little fossil backbone with turtle vertebrae in the museum collection but could not find any close comparisons. I also double-checked the possible turtle connection with the fossil chelonian expert Professor Richard Moody of Kingston University, who agrees that the backbone does not belong to a turtle.

A seasnake called Palaeophis



Luckily, Matt also spotted some other fossil backbone material (5) amongst the Sedgwick's abundant Sheppey material which does closely resemble the Curtins' find. Named as *Palaeophis toliapicus*, these fossils belong to an extinct snake species, first described in 1841 from Sheppey specimens by the famous 19th century British anatomist Richard Owen.

The Sedgwick Museum specimens of *Palaeophis toliapicus* include articulated sections of the backbone with ribs, skull parts and toothed jaws. Their anatomy, especially of the backbone, shows adaptations for swimming. This aquatic habit is reinforced by their occurrence in the London Clay alongside numerous marine fossils. However, the additional presence of many land plants and other terrestrial animal remains shows that whilst marine these London Clay deposits were laid down close to the shore under subtropical conditions. The environment was probably similar to that of the modern coastal swamps of South-east Asia.

Giant relatives of Palaeophis

Recently, some backbones from a Moroccan species of *Palaeophis* have been described, which are larger than those belonging to the living reticulated pythons and green anacondas. These include the largest snakes, which can grow to some 9m in length. A direct size comparison suggests that some *Palaeophis* species may have been even bigger but there is no indication that any of the Sheppey seasnakes were so gigantic.

The Sedgwick Museum houses an historic collection of London Clay fossils, many of which are on display including a good selection from the Isle of Sheppey.

For a good website display of London Clay fossils from the Isle of Sheppey see www.sheppeyfossils.com

For SSSI notification see: http://www.english-nature.org.uk/citation/citation_photo/1001313.pdf

Photo detail:

1.Curtfishvert: A heavily worn fossil backbone from Sheppey found by the Curtin family. Although much of the original detail has been lost, it almost certainly can be identified as the backbone of a large fish and perhaps a member of the scombrid family, which includes the living mackerel and tuna.

2.LondclayFishVert: the fossil backbones of a large fish from the London Clay at Sheppey. Although worn the vertebrae have the relatively simple shape and concave articulating surfaces to the centrum typical of fish backbones.

3.Curt.Pal.jpg: the small and heavily worn fossil backbone discovered by the Curtin Family. The central bony 'core' to the backbone is the centrum, whose end surfaces articulate with other backbones. Here we can clearly see the shape of the two articulating surfaces, one has a domed convex surface and the other a concave surface.

4.Turtlevert.: a selection of turtle vertebrae (*Argillochelys antiqua*) from the London Clay at Sheppey, showing domed centra but with a distinctive wide form.

5. Palvertnod: A stony carbonate nodule full of *Palaeophis toliapicus* vertebrae and some rib-bones whose length gives some idea of how big this snake was. The distinctive convex domed and concave hollowed articulating surfaces of several centra can be clearly seen.

Douglas Palmer