

Breathing new life into an old sea monster

One of the world's leading experts on plesiosaurs, the sea monsters of the dinosaur days, is to deliver a talk in Dublin, writes **Anthony King**

Ireland is a great place to study sea monsters, provided you are not looking for one that still swims. The Natural History Museum possesses one of the most complete fossils of a sea monster to be found anywhere in the world.

The creatures are actually prehistoric marine reptiles called plesiosaurs, animals that ruled the oceans during the dinosaur era. One type looked uncannily like the legendary Loch Ness monster.

"They had a big body with a long neck and a head with sharp reptile teeth," says Dr Robin O'Keefe, who is giving a public talk on plesiosaurs in Dublin tomorrow. O'Keefe, from Marshall University in West Virginia, is a leading expert on these extinct animals.

The museum holds a particularly complete plesiosaur fossil, a seven-metre-long *Rhomaleosaurus cramptoni*. The beast was among a group of heavily built plesiosaurs.

"It was the top predator in Jurassic oceans and was comparable to a killer whale today," says University College Dublin student Adam Stuart Smith.

He has been studying the fossil as part of his PhD thesis on plesiosaur diversity. The fossil was recently cleaned and Smith will be the first to describe this important specimen to modern scientific standards.

O'Keefe is visiting UCD to examine the newly prepared fossil and offer assistance to the student.

The US academic is interested in the evolution of plesiosaur body shape. "The most primitive ones were the smallest and most generalised. Up through the Jurassic and into the Cretaceous period, they got larger and more specialised," explains O'Keefe.

Some evolved long necks and small heads; others evolved short necks with big heads. The Dublin specimen belongs to a family intermediate between the two.

O'Keefe is interested in how the dif-

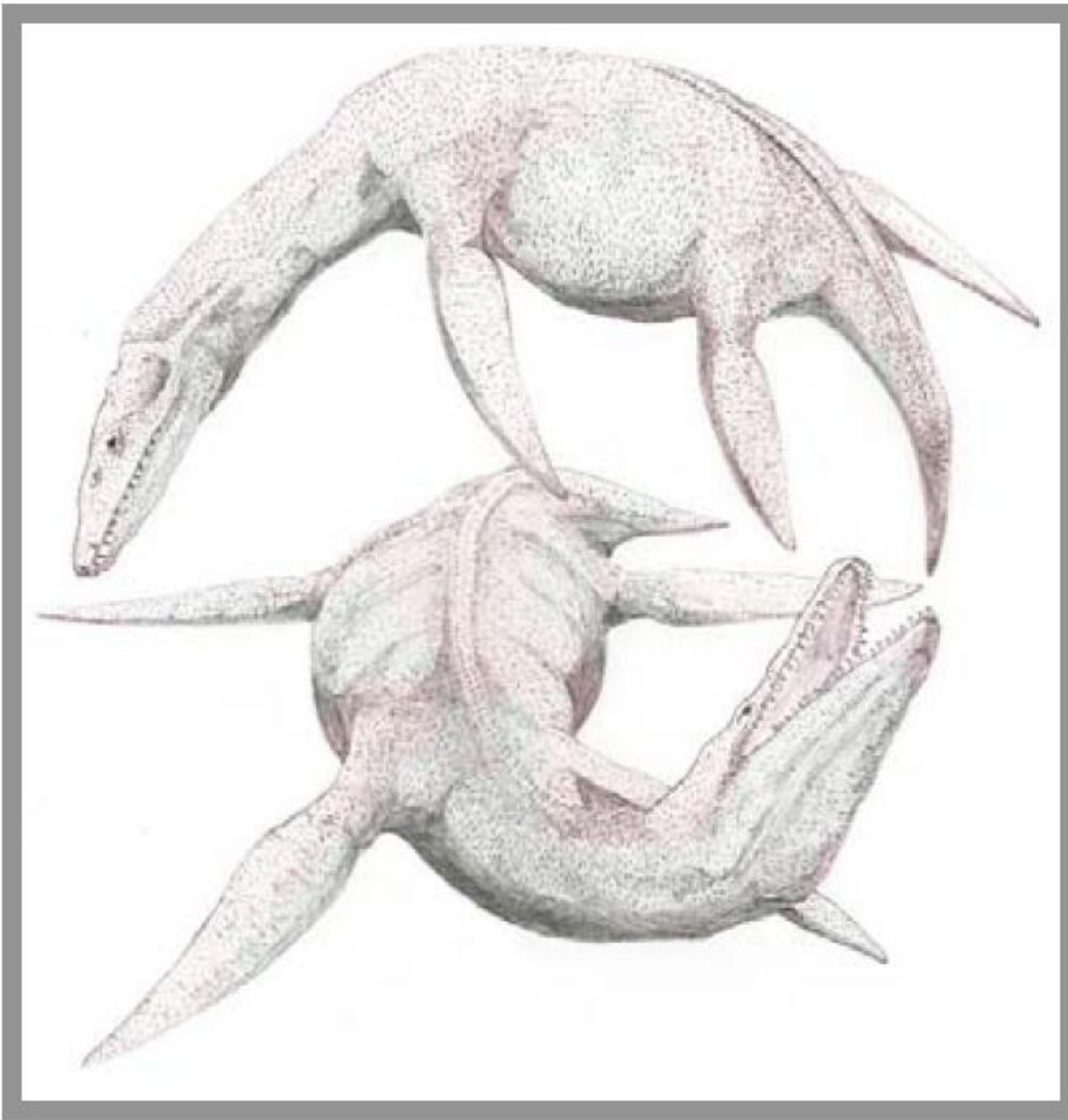
ferent forms are related and hopes Smith's work will shed light on the primitive rhomaleosaurs. "They are the least well resolved family in my analysis of plesiosaurs," he says.

Much remains unknown about plesiosaur biology, behaviour or even swimming abilities. "One problem with plesiosaurs is we really don't have a modern animal that looks anything like them," says O'Keefe. It is thought they

"flew" through the sea like penguins or sea lions, propelling themselves with four gigantic flippers. It is uncertain what combination of movement they used.

"That's why I am interested in plesiosaurs," says Smith. "Everything is a question with them. They are so unusual and weird, and there is so much potential for research."

Smith hopes to figure out which spe-



Drawing of the 'Dublin Plesiosaur' by PhD student Adam Stuart Smith

cies belong to the rhomaleosaur group and how they are related to other early plesiosaurs. *Rhomaleosaurus cramptoni* is especially interesting as it was one of the last survivors in its family, he says.

Plesiosaurs were among the largest marine predators of all time, some reaching over 50ft. "They had teeth over a foot long that were curved with a sharp point," says O'Keefe. They chased down dolphin-like marine reptiles called ichthyosaurs and other plesiosaurs, as well as fish and squid.

It had been thought all plesiosaurs with large heads and short necks were closely related, but recent research suggests the form evolved repeatedly.

"This is convergent evolution. These animals were adapting to eating very big animals and were coming up with the same answer each time," says O'Keefe.

The Loch Ness-type plesiosaurs used their neck as a long fishing pole to ambush shoals of fish. This probably conserved energy too. "Better just to move the head than drag the gigantic body through the water," says O'Keefe. No animal today has such a long neck, yet it was obviously a success, given that plesiosaurs persisted for 150 million years.

The Dublin plesiosaur is an iconic fossil. A cast hangs in the Natural History Museum in London. "The skull of this fossil is special because it is three dimensionally preserved and you can see all the different angles in the same specimen," Smith says.

Found in a Yorkshire quarry in 1848, the original was moved to Dublin for the 1853 British Association annual meeting. It had mixed fortunes after that. At one stage, the valuable Jurassic fossil was broken up with a sledgehammer to make it easier to move.

◆ Dr Robin O'Keefe will talk on the evolution of plesiosaurs at 1pm tomorrow in the school of biology and environmental science, UCD. For details contact 01 7162243