

Restoration of two *Rhomaleosaurus* (illustration by Adam Stuart Smith)

Dublin's Jurassic "Sea-Dragon"

Adam Stuart Smith, Department of Zoology, University College Dublin, describes how an ancient monster is being prepared for public display.

In 1848, the fossil skeleton of an unusual giant reptile was unearthed by workers in an alum quarry at Kettlewell on the Yorkshire coast. This 7 m long fossil, hidden away in the Natural History department of the National Museum in Dublin is still the world's largest completely articulated plesiosaur.

Plesiosaurs were an unusual group of short-necked aquatic reptiles that patrolled the oceans during the Jurassic and Cretaceous periods.

Like all other plesiosaurs *Rhomaleosaurus cramptoni*, as it is now known, propelled itself through the water with four wing-like limbs. The large triangular skull, reinforced to help resist torsion, bears a ferocious set of teeth – a combination perfect for snatching and killing cephalopods, fish, and other marine reptiles. This was the top predator in early Jurassic oceans.

Specimen under study

The Dublin plesiosaur is an important specimen for a number of reasons. Historically it is the source of a number of casts on display in museums worldwide. Scientifically, it is the holotype specimen for its respective species, genus and family. Plus, it occurs early in the evolutionary history of the plesiosaurs (the Early Jurassic Period) thus providing vital data for understanding the evolution of the group. This is why the specimen is forming the basis of my ongoing PhD project based at University College Dublin, resolving the systematics of Lower Jurassic plesiosaurs.

Complete dinosaur skeletons are very rare. Their present-day value when they come to auction tends to be measured in millions, whether it is euros, pounds or dollars.

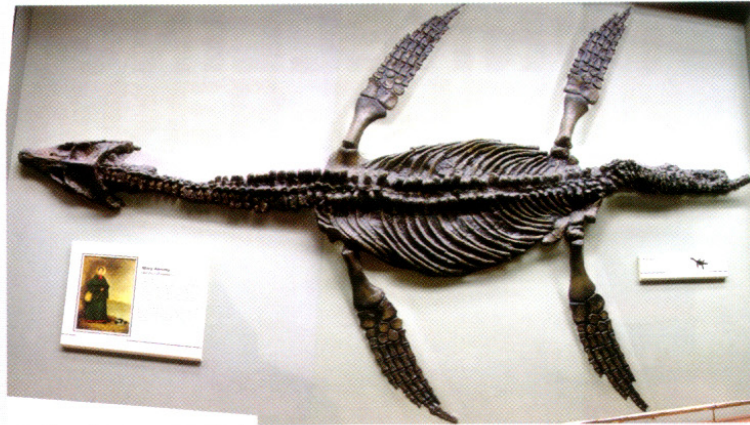
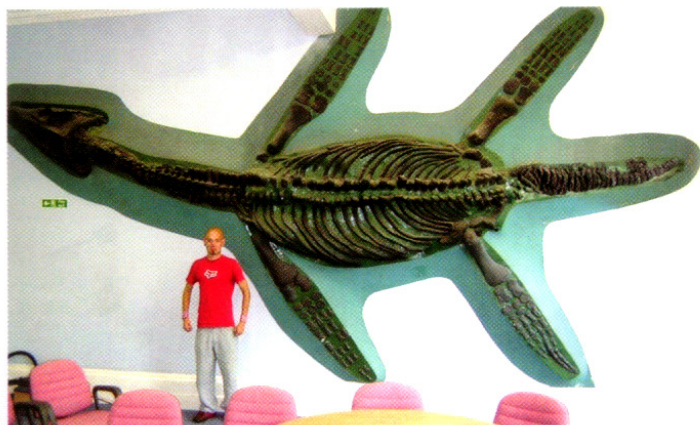
Complicated history

The history of this specimen is long and convoluted. Immediately after its discovery, the magnificent fossil was secured for five years at Mulgrave Castle, the home of the Marquis of Normanby who owned the quarry. But the specimen was soon on the move again ... to Ireland. The Marquis presented the fossil in 1853 to his friend, Sir Philip Crampton, who brought the specimen to Dublin for display as the centrepiece in the 1853 British Association annual meeting. A specially constructed building (a tent-like structure) was created by the Zoological Society of Ireland to accommodate the huge specimen and so the fossil found a temporary home on the grounds of what is now the Dublin Zoo. In 1863 the specimen was loaned for display in the Royal Dublin Society museum, and there it was briefly described and named. Later, the Royal Dublin Society museum was merged with the National Museum of Ireland who paid £200 in 1877 to acquire the specimen permanently.

In 1890, the fossil moved buildings again, from the main gallery into the museum's 'fossil hall'. But in 1979 the hall was demolished, and the specimen, together with rest of the geological collection, went into storage. The collection was moved yet again in 1992 to the National Museum of Ireland (Natural History) reserve stores at Beggars Bush, where the giant reptile currently resides.

The fossil casts

Even though the actual holotype material is in storage, this plesiosaur is a well-known, even iconic specimen. A number of casts were made of the Dublin plesiosaur including the ones displayed today in the Natural History Museum, London; the Bath Royal Literary and Scientific Institute; and in Cornell University, New York. The casts were probably purchased from Henry A Ward, who dealt in replica fossils throughout the late 1800s. However, each of the casts is unique in some way. Look closely, and you will notice that the two forelimbs of the Bath cast are identical copies of each other, and note the limbs on the London cast — these have been completely recreated.



The future

Unfortunately, during 150 years of to-ing and fro-ing, the specimen has often been neglected or damaged. At one point, the specimen was even broken into moveable pieces with a sledgehammer! The skull and body were broken into many parts and eventually became separated. With the help of museum staff (there are some very heavy segments) all of the pieces of the plesiosaur have now been relocated and gathered together again — I have been able to reconstruct the pieces of the skull, and begin describing the skeleton. An initiative has now been implemented to treat this specimen further, to make it suitable for a detailed study and for display.



The final piece of the puzzle – the author reconstructing the skull of *Rhomaleosaurus cramptoni* in Beggars Bush, Dublin (photograph by Remmert Schouten).

Spot the difference – two casts of the Dublin plesiosaur *Rhomaleosaurus cramptoni*. (left) Cast of the Dublin plesiosaur on display in the Bath Royal Literary and Scientific Institute, with curator for scale (photograph by Adam Stuart Smith). (right) Cast of the Dublin plesiosaur on display in the Natural History Museum, London (composite photograph courtesy of Matt Williams).

Other plesiosaurs in Ireland?

It is ironic that Ireland possesses such an important plesiosaur specimen, as no diagnostic plesiosaur material is known from any Irish rocks. However, there are other significant plesiosaurs in Irish collections. In the NMI alongside *Rhomaleosaurus cramptoni*, there are a number of partial skeletons, and high up on the wall of the James Mitchell Museum in Galway University is an almost complete specimen of a plesiosaurus from Lyme Regis.

Plesiosaur research

Plesiosaurs were amongst the first fossil reptiles to be recognised but they have received surprisingly little research in their long history. In recent years, plesiosaurs have received renewed attention, and this ongoing study of the Dublin specimen will certainly shed new light on the poorly understood evolution and palaeobiology of these intriguing prehistoric 'sea-dragons'.

Giant bones were an obsession of fossil collectors in the early 1800s. What did the bones mean and how did they fit into current thinking of man's place in the Universe? If you want to read more, I recommend *The Dinosaur Hunters* by Deborah Cadbury published in 2000 by Fourth Estate, London. A gripping tale of discovery, envy, malice and eventual understanding. (Tony Bazley).

www.geoparks2006.com

One of the largest geoscience conferences ever to be held in Ireland takes place from September 17 – 21 2006 in Belfast.

It is the 2nd International Conference on Geoparks with Keynote Speakers Walter R Erdelen (Assistant Director for Natural Sciences, UNESCO) and Aubrey Manning (Natural Science Television Presenter), amongst others.

Marketing, economy, tourism, conservation and heritage will all feature with post-conference field trips to the Irish geoparks, The Burren, Fforest Fawr and Anglesey in Wales, North-West Highlands of Scotland, and the North Pennines in England.

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