ALFRED GILLETT AND FOSSILS FROM STREET

This collection of local fossils was formerly in the Crispin Hall, Street. Most of these fossils came from Alfred Gillett (1814 - 1904), a retired ironmonger who lived in his family home at Overleigh House and was a keen collector of fossils all his life.

Gillett founded the Museum in the Crispin Hall in 1887, using mainly his collection, though some specimens appear to have come from other members of the Clark family and their relatives, and from the British Museum (now Natural History Museum, London).

The Museum closed in 1948 and its collections of local fossils were put into the care of the Clarks Archive and more recently into the care of the Alfred Gillett Trust. Ron Croucher of the Natural History Museum was commissioned to conserve and repair the specimens during the 1960s or 1970s.

The fossils on display

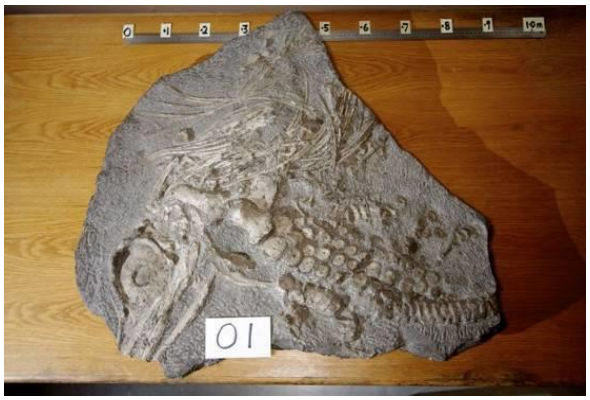
The fossils date from around the end of the Triassic or beginning of the Jurassic periods, some 205 million years ago. The collection has been little researched in recent years and the names currently used on those specimens need to be updated with further study. However, this display shows well the interesting features of a range of fossils from Street and its immediate area. Note the variety of the shale and limestone matrices in which the local fossils are found, and the way in which the specimens are embedded in cement or plaster in wooden frames.

Most of the large fossils are of ichthyosaurs – dolphin-like marine reptiles which swam in the seas much as dolphins do today, and fed on fishes, squidlike cephalopods and other prey.

As well as the adaptations of such superb sea swimmers and hunters, the fossils here also give a sense of how the various carcasses decayed and were buried for the future. Some interpretations are **suggested** here: please feel free to debate them! This area of research is little understood for Street fossils and will feature in the seminar on Friday.

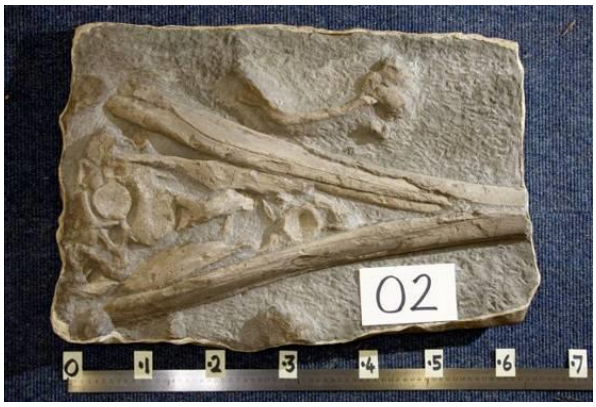
There is also a range of other small animals and plants which lived in the area at or around this time.

Please do not touch the specimens. They are old (205,000,125 years - perhaps!) and some are much more fragile than they look.



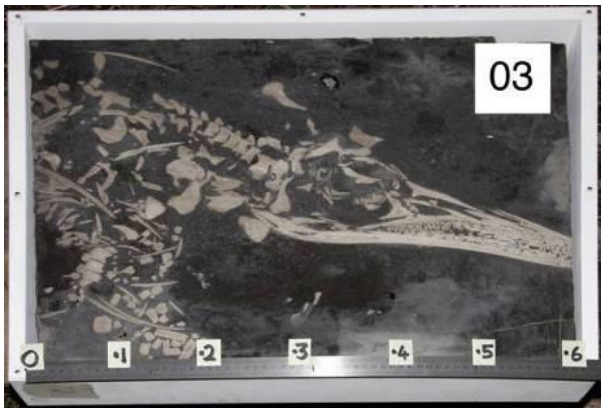
1. Leptonectes tenuirostris.

Originally identified as the longsnouted upper Lias species *Temnodontosaurus longirostris* – now *Eurhinosaurus longirostris* - by Chris McGowan. It is now identified as *Leptonectes tenuirostris* . This rear skull and anterior trunk of an ichthyosaur, shows the bony stiffening of the huge eyeball, well adapted for seeing in low light levels (ichthyosaurs may have fed at night on upwards-migrating cephalopods). In the long forepaddle, note the single bone at the base, the humerus (upper arm bone in humans), and how the bones of the lower arm, wrist and fingers have become disc-like to stiffen the paddle used for steering and slow swimming.



2. *Temnodontosaurus platyodon*.

rear part of the lower jaw and other bones of an ichthyosaur.



3. *Ichthyosaurus communis*.

The skull and anterior body of an ichthyosaur in a bed of limestone which been cut and polished to reveal the bones in section. The teeth are seen in the long grooves (not tooth sockets), while the vertebrae have circular or hour-glass (top left) cross-sections depending on how they are cut. Most of the smaller, square and rectangular, bones are from the paddle.

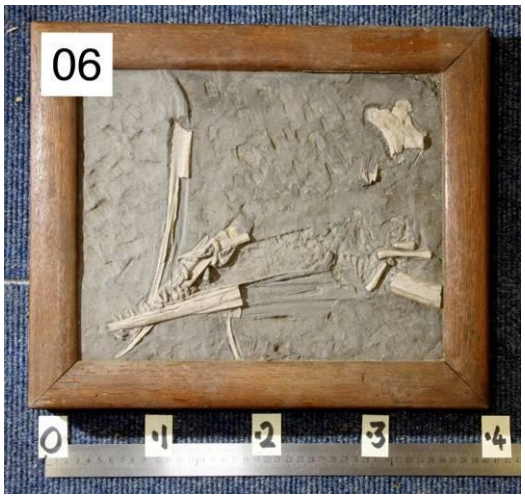
4. *Ichthyosaurus communis*.

The jaws of an ichthyosaur (most of the specimen is missing), showing the lower jaw upwards as displayed. They have been compressed vertically by the overlying mass of sediment and the dewatering of the mud around them before it hardened into rock.

Note the long thin jaws, needed for snapping at prey in water, and the simple teeth to help seize and hold the prey (but not for chewing).

5. *Ichthyosaurus* sp.
The rear portion of the vertebral column of an ichthyosaur. In life this would have reached into the lower lobe of a stiff, forked tail fin.

Note the characteristic dish-like shape of the vertebrae – this gives an hourglass shape in cross-section.



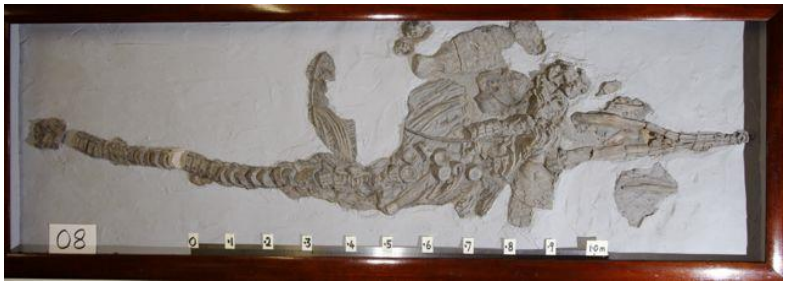
6. *Ichthyosaurus* sp.
The scattered and disarticulated bones of the jaw of an ichthyosaur. The impressions of parts of them remain in the matrix – perhaps lost during collection or at some later stage.

Plainly this fossil fell apart and was scattered, perhaps by water currents or scavengers, before its remains were completely buried.

7. *Ichthyosaurus communis.*

A somewhat scattered ichthyosaur skeleton. The larger bones of the shoulder girdle have moved to overlap the head bones.

Possibly the body cavity ruptured under the pressure of gases of decomposition to let the front of the belly flap free as the carcass sank to the sea bed – a speculation for discussion!



8. *Ichthyosaurus communis.*

A somewhat scattered ichthyosaur. It seems as if the carcass came into the mud of the sea floor lying on its belly and the upper part of the backbone was exposed for longer than the rest. This is possibly why the ligaments of the vertebrae of the backbone rotted, letting the bones scatter. Note the forepaddle moved to one side with the shoulder joint pointing to the rear.

9. *Ichthyosaurus communis.*

An interesting specimen – the body and tail have been well preserved but the head has become scattered before final burial. Notice also, that the ribs of one side are preserved in their natural position, while those of the other side are disarticulated. This specimen probably sank into soft mud on its right side, while the upper, left, side was exposed to scavengers.

10. *Leptonectes tenuirostris.*

Most of this specimen is missing – possibly because it was not spotted in time in the quarry. It shows the head and front body of an ichthyosaur, including part of the paddle. In this type of paddle the arm, wrist and finger bones have become a regular mosaic of almost hexagonal plates bound together by ligaments. The resulting fin must have been very stiff.

Note also what may be the two bones of the hyoid apparatus (to support the tongue: part of the Adam's apple in people) lying between the rear ends of the jaws.

11. *Ichthyosaurus communis.*

This is a fairly complete ichthyosaur. Although the limbs have been somewhat disrupted (one is detached from the shoulder), both are still fully articulated. This might indicate some damage by a macropredator at the surface, followed by rapid burial in soft mud as soon as the carcase sank (perhaps after the release of air from the lungs or gut). The small hindlimb or fin is visible at the end of the ribcage, as is a blackened mass in the rear of the body cavity. This must stem from the gut contents, as the black hooklets of certain squid-like prey animals can be seen in places.

12. *Ichthyosaurus communis*.

The forelimb of this ichthyosaur is most interesting – it seems to have been buried by being driven into soft sediment, as if sticking out from the carcass. It was then compressed back onto the body after the ligaments decayed, giving the imbricated (stepped/overlapping) effect seen here.

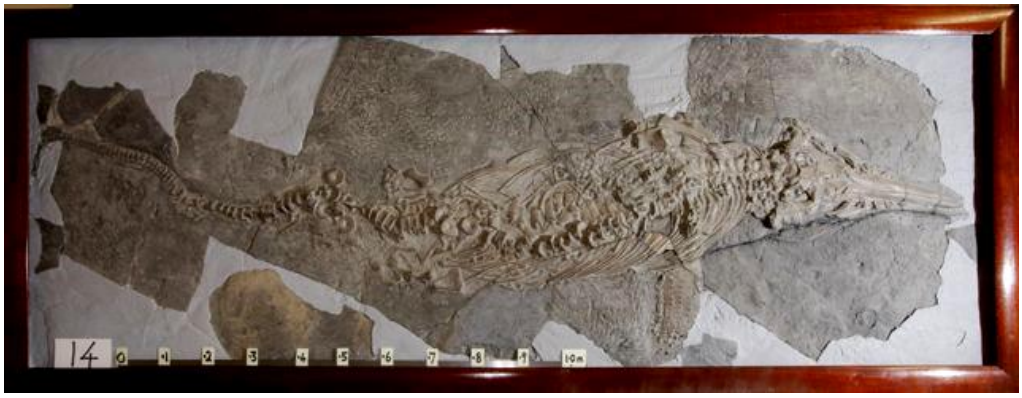
What often happens in such fossils is that the bottom side, having been buried first, is better preserved than the top side. Collectors often therefore prepared, and still do prepare, fossils from the underneath, and this seems to have happened here. Thus we see the fossil as if looking up at the animal from within the mud.

It is possible that the sea floor was so soft that this animal sank head first into the mud at least as far as the shoulders, and perhaps a little more. After nose-diving into the sea floor, perhaps at an angle of *circa* 45°, the body collapsed and it too sank into the mud. However, the upper surface was scavenged, and many bones became disarticulated.

The tail appears to have coiled around after the sinking carcass partly collapsed over the body. This suggests a very flexible tail.

13. *Ichthyosaurus* sp.

An unusual specimen – poorly preserved with only imprints of some vertebrae. You might like to consider whether they were lost before burial or during or after collection – but it reminds us that normally one sees only the best fossils out of all those that are found.

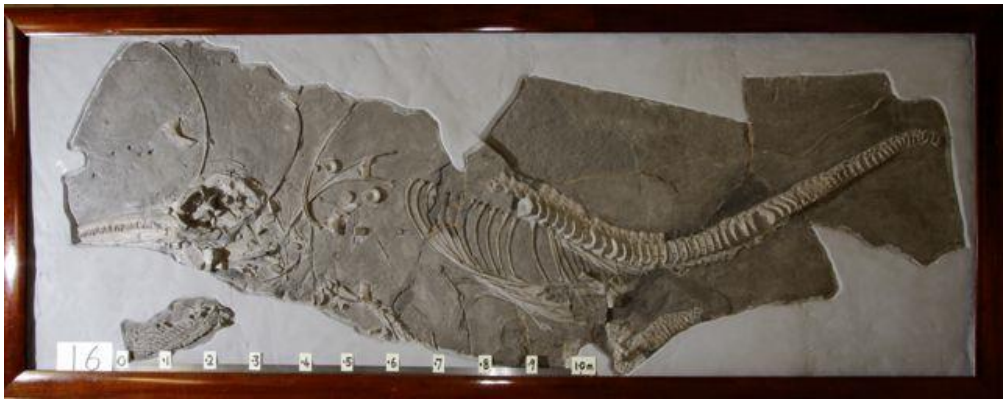


14. *Ichthyosaurus communis.*

An ichthyosaur displayed with its skull on top of its lower jaw as seen. Notice that although the specimen is complete, many of the vertebrae are disarticulated. This is because the ligaments holding them together have decayed before any significant compaction, and the vertebral centra have dropped, one by one, into the bottom of the body cavity. This is most obvious in those individuals that sank belly first into the mud.

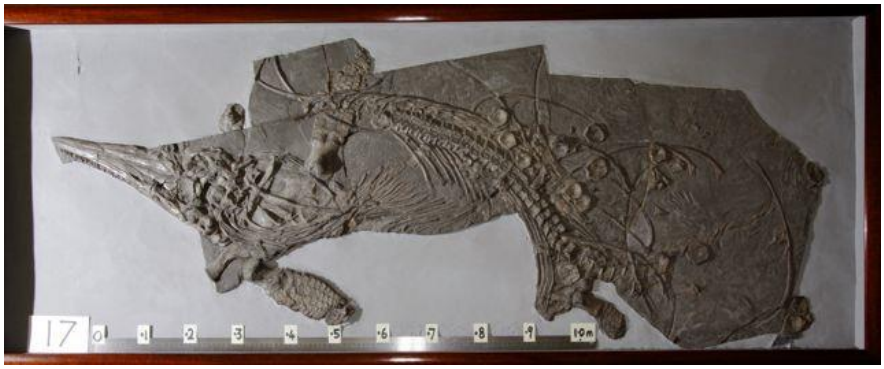
15. *Ichthyosaurus communis.*

A delightful specimen of an ichthyosaur showing its forepaddles and prey-seizing jaws and teeth. The weirdest thing about this specimen is that the left fore-paddle has passed between the rami of the jaws. Explain!



16. *Ichthyosaurus communis.*

A fascinating ichthyosaur – notice how a stretch of ribs seem to remain in place even after their associated vertebrae have gone. Did this specimen sink into soft mud tail first, leaving the rear end and bottom side better protected from scattering? Note the small hind paddle near the vertebrae. Or perhaps a large chunk bloated with gas drifted off to be preserved elsewhere. Sometimes the stomach region explodes due to a build up of gas in the alimentary tract. This can scatter bones and strips of flesh widely across the sea floor.



17 *Ichthyosaurus communis*.
Another specimen affected by scattering prior to burial. The head and shoulders of this individual sank into very soft mud, but the body appears to have been severely disrupted.

18. *Leptonectes tenuirostris.*

This specimen shows a type of forefin where the bones were set in a matrix, presumably, of cartilage, rather than being closely butted together. The specimen also shows a dark mass of stomach contents. The jaws seem extremely short compared to the length of the fore-paddles: you might however want to consider whether this is a quirk of fossilisation or damage.

Note that the hip girdle and rear limbs are scattered without any disruption of the vertebral column. This shows how the hips have become completely detached from the vertebral column in ichthyosaurs, to allow the continuity of the body muscle mass through to the tail fin. As ichthyosaurs could not move on land, there was no need to support the weight of the body on the legs through the connection between the hips and backbone.

19. *Thalassiodracon hawkinsi.*

This is a relatively rare specimen – a plesiosaur, probably the main Street species *Thalassiodracon hawkinsi*, though it needs study. The specimen shows the main bones (humeri and femora) of the four swimming limbs of plesiosaurs, and some of the remaining bones of two limbs, as well as the relatively short body and tail. Missing (to the left) is the relatively long neck and small head of this type of plesiosaur. May be *Eurycleidus arcuatus ?*

Text by Michael Taylor, David M Martill and Ryosuke Motani
Fossil photos by William Clark
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