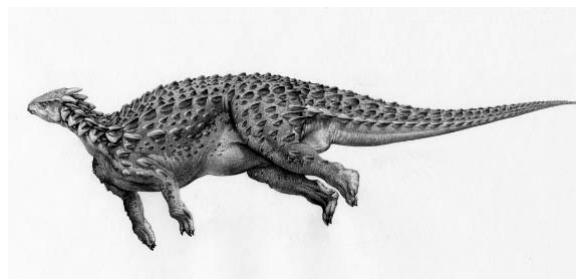

THE 'NEW FIND' – BLACK VEN HORNED SCOLIDOSAUR SKELETON – 'The Finest Dinosaur Ever Found in Britain.'

Write-up on Dr Tim Ewin's lecture with
illustrations by John Sibbick at the Society's
May 1st '08 Meeting

Pete Bath

The practically complete, three dimensionally preserved, heavily armoured skeleton of this quadrapedal, herbivorous dinosaur went on public display in June this year in the Dinosaur Gallery at the Bristol City Museum. Hitherto only a full reconstruction cast of this skeleton was on view at the Charmouth Heritage Centre. Starting in foul weather in December 2000, David Sole, a professional collector, noticed bone on one small face of a large fallen slab some 3' 6" by 2' in the foot of a major Black Ven landslide. David, his son and another professional collector between them, twice a day for some five years returned to the same spot to retrieve, piece by piece, some twelve or so separate large blocks packed full of bone. These were then prepared by professional preparator David Costin. The dinosaur originated from the 'Woodstones' horizon, stratigraphically in the upper third of the Black Ven marls. This skeleton contains a nicely retained specimen of *Asteroceras* that conveniently dates this creature to the Sinemurian stage of the Jurassic, 195 Ma. The presently continuing chemical studies being undertaken at the University of Bristol Earth Science Department labs promises, not only the finest, immaculately restored, most complete British dinosaur fossil, but potentially one of the most revealing.

This 'New Find' is only the second complete adult skeleton from the ten sets of remains found over 160 years to date. The first *Scelidosaur* and the first complete dinosaur skeleton remains of any kind ever recorded, was *Scelidosaur harrisonii* story began with this first scientific description as 'a swimming dinosaur'. These dinosaurs are only found in Lyme Regis from a horizon of deep water marine sediments found by James Harrison of Charmouth in 1858.



Scelidosaur in death position

He first sent a limb to Richard Owen who in turn persuaded Harrison to go back and look for more of this specimen which he did do. Owen, in 1863, named the creature 'limbed lizard' and the containing fossil plesiosaurs, ichthyosaurs, ammonites, moonfish and corals but also incongruously, terrestrial fossils including wood and dinosaurs and now, even more incongruously, including crocodile teeth!

Currently it is thought Scelidosaur is early, primitive, members of the thyreophorans and are most closely related to the armoured dinosaurs; *Ankylosaurs* rather than the plated dinosaurs; *Stegosaurus*, as previously was thought. Their back, sides and tail were covered with linear patterns of keratin-covered scutes set in a mosaic of rounded hardened scales. The spine has no vertical line of plates as might be imagined from a side view in many older illustrations, but has a lateral V section.

Given that the 'New Find' Scelidosaur was 'Horned' while *harrisonii* was not, this will be evidence for sexual dimorphism or, more unlikely, of another taxon? Sexual dimorphism is again indicated by the particularly large, heavy and fused neck armour and large size of this specimen.

The Bristol Exhibition includes two juvenile specimens one with the best yet preserved Scelidosaur forelimb and fingers and another found by Chris Moore, with fossilised tissue – tough, scaly, reptile-like skin. Generally there are minimal differences between juvenile dinosaurs and adults but the scutes of young Scelidosaur are quite different from adults: only in juveniles is scute seen unfused to other scutes. Experts at Bristol have re-modelled skin features for 'in-life' style display purposes but there was considerable variation in scute size and arrangement in both the adult and juvenile members of this herd/family group which shared the same catastrophic end.



The full skeleton

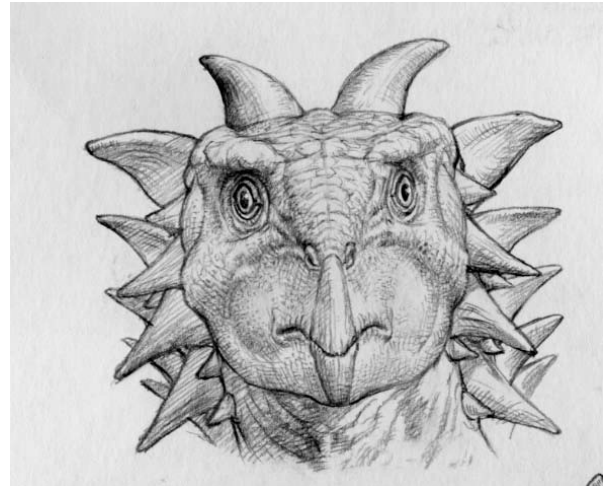
The 'New Find' restored skeleton is heavy, yet brittle and reveals an animal of 4 ft / 1.3m in height, 12 ft / 4m in length and some half a tonne / 500 kg in weight. A quick observation, from head to tail, reveals a beak-like structure, not recovered by David himself, found in many low browsing vegetarian dinosaurs, which fed on ferns, cycads, conifers and ginkgos. The full set of teeth is notably gripping two substantial crocodile teeth between them! Does this really suggest a marine swimming, vegetarian dinosaur with a taste for predatory crocodiles? Three different explanations suggested are: the crocodile teeth rolled in whilst the animal was dead on the sea floor, the Scelidosaur sank to the sea bed following a crocodile attack when its teeth were embedded, or the teeth were eaten and then got stuck in the mouth after its final act of vomiting as the animal drowned. Sheep are known to compensate for a low calcium diet by consuming bone material left in sheep skeletons, so Tim finds the idea of vegetarian dinosaurs consuming the then commonly available 'shed crocodile teeth' from sand flats to the same end, as more than plausible.

Specialised neck vertebra and the spine, are seen to be reinforced by uniquely ossified tendons or sinews. The scapula and humerus stand out well in three dimensions with good evidence for inter-bone soft-tissue cushioning and muscular function.

Unavoidably one cannot miss the soft-tissue appearance of what is deemed to be the gullet, or possibly even a crop? It seems very likely that here there may be remains of the last meal being vomited on drowning, as commonly happens in animals today. Fossilised plant material is not evident but University of Bristol lab staff are currently using chemical analysis to find out what remaining content, if any, can be determined from this organ.

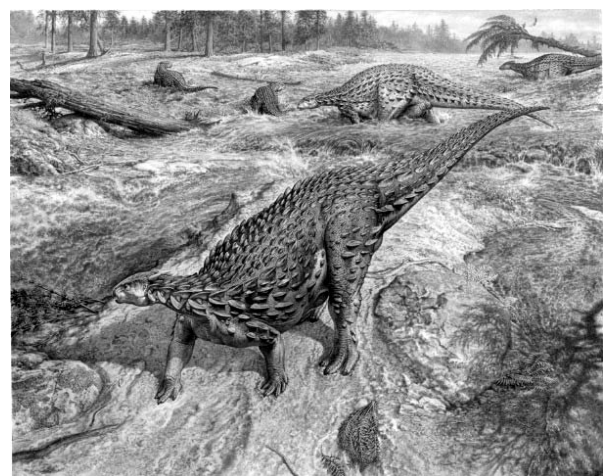
More evidence, from the whole skeleton, of soft-tissue can be seen as intra-costal muscles, the wall of the stomach or some other organ. The spine has

smallish scales, which extend into the tail that is heavily armoured. Small scales outcrop at the pelvis suggesting a decorative rather than aggressive purpose? A femur and both knee joints are seen below the tail, which has been truncated and the preparatory, David Costin, has thoughtfully made a nice job of keeping the flat lying-inset *Asteroceras* in situ for all to see.



Portrait View – Artist's impression The eye socket is crowned with a prominent bony brow, the pronounced temporal fenestra remains open, and a pair of short horns is set on the squamosals, maybe to intimidate rivals as does a lion's mane as a threat or for sexual attraction, or both.

There being no significant landmass close to the deep water Black Ven marl deposits makes the very presence of terrestrial materials and a dinosaur graveyard an important question, but one to which we can posit an adequate answer today. Post tsunami transport and deposition can cover



Scelidosaurus in flood

great distances while reliably concentrating deposits of known origin at a particular distant location, so while quite distant Cornubia was the

nearest land at the time of this catastrophe, with maybe a little of the Mendips close by, the ½ mile-across Woodstones horizon seems to represent an ‘only happened once tsunami event’ in the Lias.

Only fragments from North America and a poorly preserved specimen from China show anything at all similar to the Black Ven dinosaur fossils, so the clearly ‘group herding’ or extended family structured Scelidosaurus are still an extraordinary find and still unique to this bit of the Lias.



*Fore -section of skeleton showing ribs and scutes.
(Photograph by Bernard Newton)*



*Detail of spine showing ossified tendons
(Photograph by L Drummond-Harris)*



Ammonites have colonised the skeleton (L D-H)



*Detail of the jaw showing the remarkable
preservation of the teeth
(Photograph by L Drummond-Harris)*

DID YOU KNOW? GEOLOGICAL SCIENCE AT BRISTOL MUSEUM

Alan Bentley

- Bristol's geological collection is the 6th largest Museum collection in Britain.
- Until now, the Museum has had a specialist Geology Curator for nearly 180 years. From 1831 to 1850 the Museum (then known as The Bristol Institution) employed the famous naturalist and geologist Samuel Stutchbury in that capacity. Stutchbury was no amateur. In 1834, at the age of 35, he collaborated with Dr H Riley in excavating the first recorded remains of the reptile *Thecodontosaurus*. These were found in Triassic fissure fills in the Clifton Down Limestone of old quarries on Durdham Down. Stutchbury's consultancies included working with Sir Charles Lyell on Home Office inquiries.
- Bristol's excellence in the preparation and display of fossil vertebrates has continued down to the present day. This is acknowledged internationally. Accessions include one of the most complete Pliosaurus ever discovered, the oldest Stegosaur ever discovered, and recently