

The Isle of Wight **sauropod**

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The Wessex Formation forms part of the Wealden Group on the Isle of Wight, and was formerly known as the Wealden Marls. These strata are mainly alluvial in origin and have long been known as a rich source of Barremian (Lower Cretaceous) dinosaur remains (Osborne White 1921, Stewart 1978). Over the last 150 years, the most substantial remains have come from outcrops of the Wessex Formation in Brighstone Bay, on the south west coast of the island, which now constitutes part of the Hanover Point to St Catherines Point SSSI. Despite this long history of investigation by generations of collectors, unique *in situ* finds are still frequently uncovered in these eroding cliffs (Earth science conservation, 24, page 45).

The latest episode in Wealden investigations started when one of us (Steve Hutt) discovered a few crumbling bones during a routine cliff walk in February 1992. Fieldwork of this nature is increasingly essential to the Museum of Isle of Wight Geology; the Lower Cretaceous outcrops on the island are not only being rapidly eroded, but are receiving more attention from

collectors than ever before. Dinosaurs are currently enjoying a national rise in popularity and Wealden bones are becoming increasingly valuable objects.

This most recent discovery was made in a distinctive, but hitherto undocumented, fossiliferous layer near the top of the Wessex Formation at Barnes High (Figures 1 and 2; Photo 1). At first sight, this is a typically unfossiliferous mudstone, but closer inspection reveals an abundance of freshwater bivalves, preserved as friable clay casts. Such fossiliferous layers are poorly documented, but occur as lenses at several levels in the Wessex Formation (Stewart 1978 and our observations), and appear to represent the deposits of freshwater ponds or lakes. The Barnes High layer is presently only exposed in the immediate vicinity of the new site, but better exposures in the past have allowed it to be traced for approximately 100 metres to the north west. Previous discoveries in the layer have included the partial skeleton of an *Iguanodon* and an isolated sauropod femur. These important specimens are in the

collections of the Museum of Isle of Wight Geology and currently form part of the public display.

Initial excavation

After the landowners had been informed of the new vertebrate occurrence, help was offered by several local collectors, and some funding was sought for their efforts from English Nature and the Curry Fund of the Geologists' Association. A single day of excavation in February 1992 revealed several ribs and vertebrae, and it was obvious that a large quantity of bones remained to be dug out. It also became quickly apparent that the bones were those of a sauropod, rather than a more commonplace iguanodontid, as first expected. The initial dig lasted about a month, and was blessed with relatively dry weather and good ground conditions. During this time, approximately 30% of a medium size sauropod skeleton was carefully exposed, numbered, plotted, photographed, plastered and transported back to museum premises. This included well preserved elements of the forelimbs,

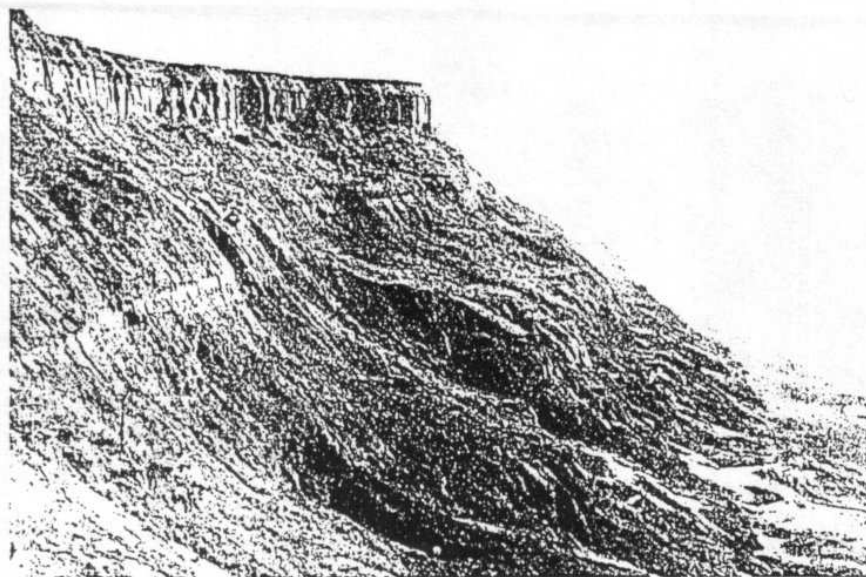


Photo 1. The cliffs and slopes of Barnes High. Note the White Rock - a conspicuous sandstone marker band below the main vertical face of Barnes High Sandstone. The sauropod excavation is visible as a dark hollow near the bottom centre of the photograph. (Photo by Jon Radley)



Photo 2. The finished product - a well preserved vertebra. The ruler is 30 centimetres long. (Photo by Jon Radley)

including ribs up to 1.5 metres (length), shoulder blades, pelvic elements, various vertebrae (Photo 2) and several gastroliths. The bones were extensively disarticulated and disturbed from their original skeletal configuration, but were nevertheless concentrated in a small area measuring approximately 4 metres by 2 metres. Associated finds during this early stage included a small hypsilophodontid (small herbivorous dinosaur) tibia, as well as a theropod (carnivorous dinosaur) tooth.

The find hit the headlines (national and local press, and local radio) in the late summer, despite our efforts to keep it under wraps. The general interest on the island culminated in the appearance of a rather nice newspaper cartoon (Figure 3). Although the publicity initially caused the museum and our superiors some concern, no harm came to the site - which was, by this time, safely buried beneath a quantity of overburden stockpiled during the initial dig.

The excavation continues

Excavations were able to resume towards the end of the year, with the help of undergraduate students from the University of Portsmouth. The first shift of Portsmouth students arrived on 5 November and excavation started again the next day. Nick Chase (an experienced local collector) was appointed as site foreman, allowing museum staff a greater degree of flexibility. Digging commenced in unfossiliferous mottled mudstones, a few metres above the target layer. The intention was to remove a large wedge of rock from above the seam, which would hopefully expose a larger expanse of the fossiliferous layer (Figure 2). This would also provide a clearer section through the overlying mudstones and bioturbated sandstones which constitute the top of the Wessex Formation here. Part of our long term programme is to collate a new lithological log of these strata, to put the vertebrate finds into a clearer sedimentary context. Bad weather severely hampered digging through November and December; the excavation caved in on one occasion, and mud flows above and below the site started to form a serious hazard. Nevertheless, within five weeks, a fresh section was available for the first time from the

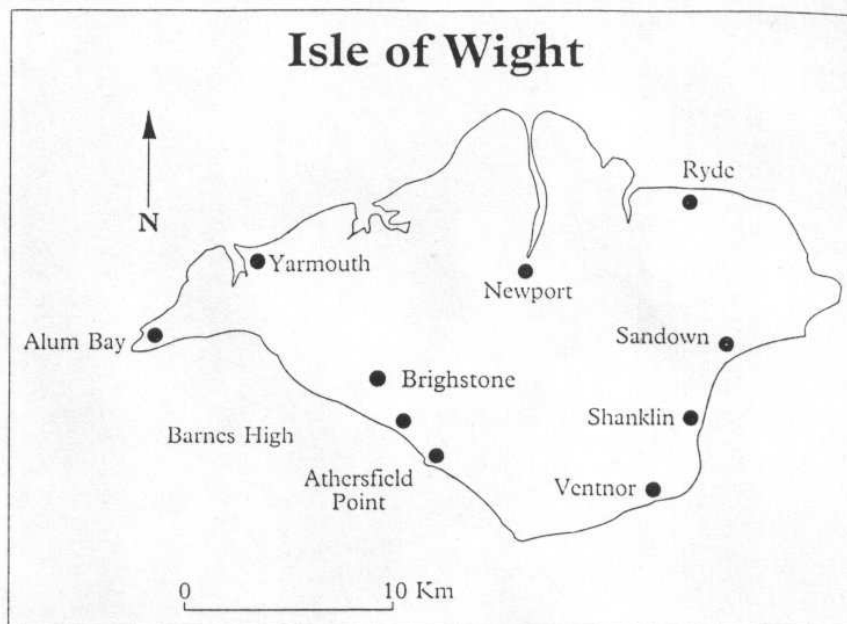


Figure 1. Locality map.

top of the Wessex Formation down to the fossil bed (Figure 2).

Bones soon started coming to light, including more ribs, several vertebrae and a second theropod tooth. More bivalves were collected and an overlying bed yielded an *Iguanodon* tooth. Bad weather continued; on one occasion a driftwood bonfire had to be lit to dry

out plaster jackets! Some of the new material had to be removed in extremely heavy and cumbersome blocks of plaster encased sediment. These were dragged to the cliff top with the aid of a tractor, owned by Geoff Phillips, and a specially constructed metal pallet.

Renewed interest from the *Mail on Sunday* resulted in a high profile

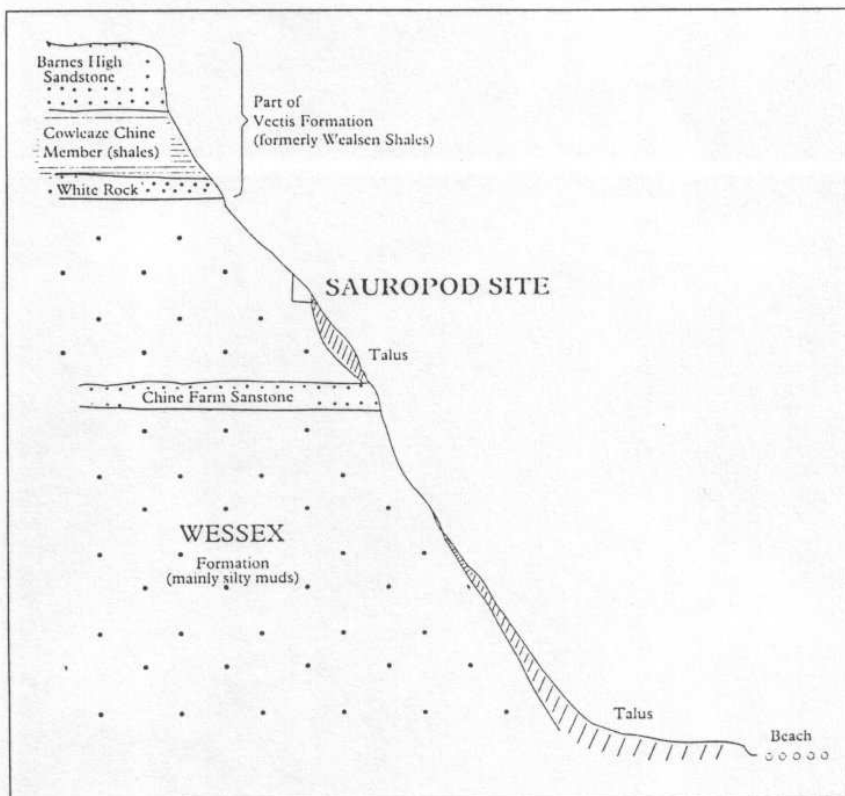


Figure 2. Schematic geological cross section of Barnes High, showing the position of the sauropod excavation (actual cliff height is about 50 metres; not drawn to scale).

centre feature in the edition of 10 January 1993. This sparked off a wave of reports on both local, national and international television and radio, as well as in other newspapers.

At present (February 1993), the excavation is still in progress, although conditions are being increasingly hampered by water, landslides around the site and the sheer bulk of overburden. Access from the beach below is currently impossible, due to the build up of treacherous mud flows. Some material is undoubtedly still in the cliff, and skull bones and much of the tail still remain undiscovered. The site should be safe from erosion for the near future, although a lot of movement is taking place immediately above and below. Intermittent excavation will continue over the next year or so.

Preliminary preparation and research

Careful preparation of the bones is now underway and involves the removal of the clay matrix with needles, brushes and small quantities of water - an easy but laborious task. Chemical consolidation is essential as work progresses as many bones are fragile and of light construction, although their non-pyritised condition meant that short term storage in the museum cellar presented few environmental worries. The partial skeleton is that of a brachiosaurid sauropod, estimated as being about 15 metres long in life. This represents the most complete sauropod known from the Wealden of southern England. Bones from similar animals are frequently found on the island and a full taxonomic study will commence when the new material has been prepared.

It currently seems likely that the sauropod (and previously discovered *Iguanodon*) died on land, and was subsequently inundated by flooding. The seemingly chaotic disarticulation and distribution of the sauropod bones could be explained by terrestrial scavenging of the carcass prior to flooding. This is indicated by the discovery of associated shed theropod teeth, which are well documented evidence of terrestrial predation or scavenging of dinosaur carcasses at other sites (Buffetaut

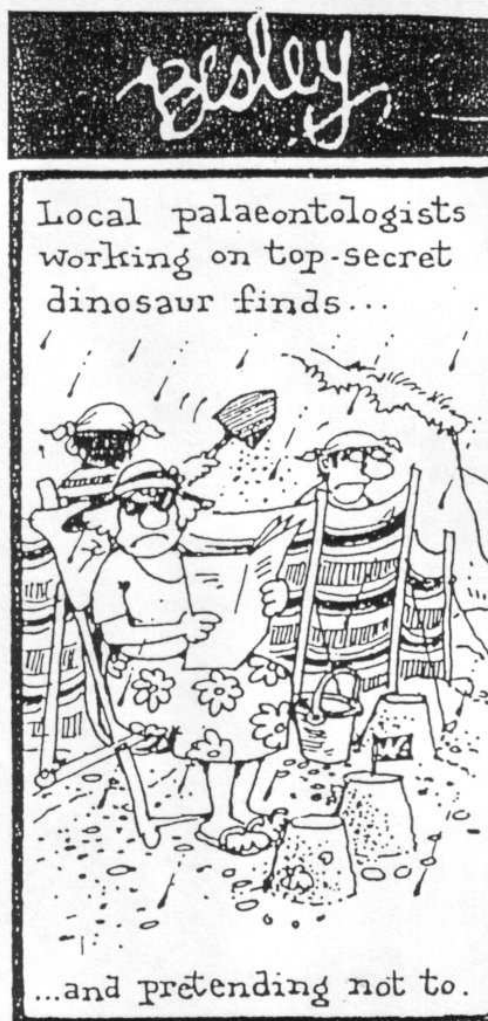


Figure 3. Cartoon from Isle of Wight County Press, 11.9.92.

and Suteethorn, 1987). The isolated sauropod femur discovered previously in the layer may feasibly have come from the same animal as the new finds, but this cannot be proved at present. The freshwater bivalves recovered at the site are a welcome bonus and await more detailed research. Similarly, samples of sediment from the layer have been supplied to David Batten of the University College of Wales, Aberystwyth, for palynological preparation and investigation.

The fund and its future

Several volunteers worked on the bones at the museum during 1992, and further help has been offered by enthusiasts from the island and further afield. Nevertheless, it is anticipated that the partial skeleton will take several years to prepare and document in full. Less substantial, but important, sauropod remains are constantly being found on the island,

and indicate the occurrence of several species.

Many of the bones will be prepared at a new storage facility, a few miles from the present museum site. Although we do not currently have the space to display the skeleton, a new geology museum on the island is becoming a real possibility. If realised, this would feature the sauropod and other island skeletons as a centrepiece.

Acknowledgements

The excavation would not have been possible without the cooperation and assistance of the landowners, Sylvia Jones and Barbara and Geoff Phillips. The Museum of Isle of Wight Geology wishes to acknowledge the financial support of English Nature and the Curry Fund of the Geologists' Association. Amongst the many people who have helped in the field, special thanks are given to Nick Chase, Mick Green and the hard working undergraduates from the Department of Geology, University of Portsmouth. Mike Barker of the University of Portsmouth is thanked for organising the student workforce.■

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