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Professor Percival Allen FRS
1917-2008

In April 2008 we learnt of the death of Professor Percival Allen (known to all as “Perce”) at the age of 91. See page 2.

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Obituary - Professor Percival Allen FRS 1917-2008

In April 2008 we learnt of the death of Professor Percival Allen (known to all as “Perce”) at the age of 91. Much of what we now understand about the Weald can be attributed to Perce, both through his work on the Wealden rock formations of south-east England, and by his encouragement and ability to inspire colleagues, research workers and students.

He was born at Brede, near Hastings in 1917, and attended Rye Grammar School, and although he spent much of his academic life in Reading he frequently visited his beloved Sussex in his quest to understand the Wealden rock formations of south-east England.

He took his BSc at Reading University in 1939, followed by a PhD in 1943 on the Cretaceous sediments of the Weald. The Weald of south-east England remained a passion for Perce throughout his life, with much of his work being on the sandstone beds at Philpots Quarry in West Hoathly, West Sussex. The photographs show Perce Allen leading a joint field meeting of the Geologists’ Association and the British Sedimentological Research Group to Philpots in 1992.

His work on Wealden deposits and environments dominates our thinking and understanding of the Weald to this day. In 1975 the Geologists’ Association produced a volume commemorating the centenary of the publication of ‘The Geology of the Weald’ by William Topley. In this volume Perce presented a paper where he turned away from the old idea of a lake or deltaic Wealden and proposed a new model for the Weald (Allen, 1975), an idea which he developed further in his 1979 and 1980 presidential address to the Geological Society (Allen, 1981) and finally in his 1998 paper in the Proceedings of the Geologists’ Association on Wealden climates (Allen, 1998). In his new model the Wealden is seen as alternating sandplains and mudplains, the change being linked to marginal faulting. The environment was freshwater with brackish incursions, but never fully marine, similar to Botswana’s Okavango delta today [David Horne] or the Maracaibo basin in Venezuela [Perce]. The model was built on his study of both the present and the past – he visited India to study the subcontinent’s great river systems, and back in Sussex he joined the management committee of Philpots so that he could watch the face being cut back and study the all-important 3D sedimentology for his new model. Perce’s Wealden model still holds good more than 30 years after its initial publication – a close reading of his papers reveal a wealth of supporting detail about structures, flora and fauna, and comparisons to modern river systems, and stand as a model themselves of a lifetime’s rigorous scientific investigation, analysis and interpretation.

His career and many achievements and honours have been well documented in his obituaries (Geological Society and Daily Telegraph), but a few key points are included here. In 1946, following his PhD at Reading, he took up a lectureship at Cambridge, and in 1952 moved back to Reading, where he was appointed Professor and Head of the Geology Department. He remained at Reading until his retirement in 1982, when he became an Emeritus Professor, and he was still undertaking original research well into retirement.

In 1959 he published a prophetic paper emphasising the importance of the North Sea as a potential source of oil, and advocating a programme of exploration there. He took a leading international role in the development of sedimentology, with much of his work revolving around the understanding and interpretation of Wealden sedimentation, and at Reading in 1962 he founded the Sedimentology Research Laboratory, working tirelessly to raise funds for it, mainly from the oil industry. He also founded the Sedimentological Research Group, and proposed the formation of the International Association of Sedimentologists. He was also a member of the Natural Environment Research Council and founded the Association of European Geological Societies.

He received the Lyell Medal from the Geological Society in 1971, and was elected to Fellowship of the Royal Society in 1973, serving as Vice-President from 1977-79. He also served as President of the Geological Society from 1978 to 1980, and was an honorary member of the Geologists’ Association and many other societies. Recently the Association of European Geologists instituted the Percival Allen Medal, to reward geologists who have done most to foster international relationships in the earth sciences, something of particular interest to Perce.

For all of his academic achievements, he also displayed a mischievous sense of humour. In 1959 he collaborated with Reading University’s rag students in the announcement that diamonds had been found in the gravels of the Thames Valley. For this he achieved considerable notoriety and attracted the wrath of certain members of the academic establishment as well as of The Times newspaper, which wrote a stiff leader about the irresponsibility of a scholar indulging in such frivolity. To others it illustrated his sense of fun and demonstrated an affinity with his students.

Perce Allen was undoubtedly one of the leading international figures in sedimentology, and it is fair to say that his lifelong passion for the Weald has given us a much deeper understanding of the Wealden geology of south-east England.

A celebration of his life was held at the Memorial Woodlands in Alveston, near Bristol, where he was buried in natural woodlands with donations going to ‘Friends of Rye Bay Nature Reserve’. The theme of
the service was Perce’s watchword “There is no such thing as boring”. Following the service friends cast into his grave small rock specimens and fossils they associated with Perce and his work.
Perce Allen is survived by three sons and a daughter.

References

Perce Allen at Philpots Quarry in 1992 with the late Roland Goldring in the background. Roland specialised in trace fossils and was a member of Perce’s old department at Reading. Roland’s last paper was on Wealden trace fossils (Goldring et al., 2005).
*Photo: Ed Jarzembowski*

*Perce Allen at Philpots Quarry in 1992 explaining the geology to Geologists’ Association members.*
*Photo: Ed Jarzembowski*
Wealden News No.8, February 2010

Bennettitalean trunks from Hastings

Next time you traverse the section from Rock-a-Nore to Ecclesbourne Glen keep a watchful eye at low water for trunks of the Wealden bennettitale Monanthesia. The bennettitales are an extinct group of gymnosperms (seed plants), superficially similar in appearance to the cycads. The two groups are only distantly related (see Austen, 2001 ‘What are Bennettitales?’), and although the bennettitales became extinct at the end of the Cretaceous, they formed an important component of the land vegetation during early Cretaceous times.

Over the past few years two of these bennettitalean trunks have been recorded in shoreline exposures of the Ashdown Formation (Hastings Beds, late Berriasian to early Valanginian). The first was found in 2002 by Sue Bower embedded in the sediment at low water about 100 metres east of the end groyne at Rock-a-Nore (Figs 1 to 3), and in 2008 another was found by Wolfgang Pachner close to the waterfall at Ecclesbourne Glen, once again embedded in the sediment at low water (Fig. 4).

The coastal section at Hastings from Rock-a-Nore to Cliff End is famous for its early Cretaceous fossil plants, and of the 130 or so species recorded from the Weald, around 90% can only be found as macrofossils along this 8 kilometre section of coast. Although a large number of these were collected in the late 19th and early 20th century, and many are only known from a few specimens, interesting material can still be found.

Both the Wealden bennettitales and cycads have been comprehensively redescribed by Joan Watson and her colleagues (Watson & Sincock, 1991 and Watson & Cusack, 2005), updating the previous major work by Seward (1895).

It’s important to record these exposures when they appear, as once exposed, unless they are quickly reburied by sediments, they are rapidly destroyed by erosion.

My thanks to Sue Bower and Wolfgang Pachner for photographing the specimens, and also to Ken Brooks and Alan Prowse for bringing them to my attention.

References


Seward, A.C. 1895. The Wealden flora II. Gymnospermae. Catalogue of the Mesozoic plants in the Department of Geology, British Museum (Natural History) 2, xii + 259 pp., 20 pls (London).


Peter Austen

**Web in amber from Bexhill**

What is thought to be the world’s oldest spider web in amber has been found in Wealden deposits in East Sussex.

The amber was found by Jamie Hiscocks in layers of lignite within coastal exposures of the Ashdown Formation (Hastings Beds, earliest Valanginian) close to Bexhill, East Sussex.

The discovery was first reported to the annual meeting of the Palaeontological Association at Glasgow in December 2008 by Professor Martin Brasier, a palaeobiologist at Oxford University (Brasier et al., 2008), and has now been published in the *Journal of the Geological Society* (Brasier et al., 2009). At 140 million years old, it is 10 million years older than the previous oldest fossil spider web, which was found in Lebanese amber (Anon., 2008).

It is thought that the web was produced by an orb web spider. Charred bark and burnt sap inside the amber suggests that the tree, probably a conifer, had been damaged in a fire and produced resin (later to become amber) to protect itself from infection (Gray, 2008).

Further reports and photos can be found in *Geoscientist* (Day, 2010), *The Times* (Henderson, 2009) and *The Daily Telegraph* (Anon., 2009), all of which can be found online.

**References**


Microvertebrates from the Isle of Wight

Recent work by Dr. Steve Sweetman has uncovered a remarkable new Early Cretaceous vertebrate fauna on the Isle of Wight. Dr. Sweetman, a research associate at the University of Portsmouth, spent four years collecting and sifting through sediments from a total of 27 plant debris beds of the Wealden Group Wessex Formation (Barremian) exposed on the south-west (Fig. 13) and south-east coasts of the Island (Sweetman, 2006b, 2009b,d). Over this period he collected almost four tons of sediments (far more than any previous studies) and using a sieve with a smaller mesh size than those used by earlier workers (Sweetman, 2009a) managed to recover an extraordinarily diverse microvertebrate assemblage.

A total of about 46 species of terrestrial vertebrates had previously been known from the Isle of Wight, but Dr. Sweetman has added a further 50 or so to this (Sweetman, 2009b,d, pers. comm. 2009; Alleyne, 2009). This more than doubles the species tally of the last 180 years, most of the remains of which were collected by surface prospecting. Figure 1 illustrates how these discoveries have changed our understanding of tetrapod diversity in the Early Cretaceous (Barremian).

His finds include at least six new mammals (Sweetman, 2006a,b, 2008, 2009c,d), represented by a partial dentary (Fig. 11) (Sweetman, 2008) and isolated teeth. The jaw (Fig. 11), which includes a number of teeth, is the first to be recovered from the British Wealden Supergroup. Other finds include possibly as many as three birds, currently represented by isolated teeth; eight or nine new dinosaurs (Figs 8 to 10), including the first record of a velociraptorine dromaeosaurid dinosaur (Fig. 9) from the British Wealden (Sweetman, 2004); several pterosaurs (Fig. 7); two new crocodiles (Fig. 6); perhaps as many as 15 lizards (Figs 4 and 5), the most diverse Early Cretaceous assemblage so far discovered (Sweetman, 2009b,d) and amphibians, including frogs (Fig. 3), salamanders and an albanerpetontid (Sweetman 2009d) (Fig. 2). He has also recovered fish remains including teeth of a neoselachian shark, the earliest record to date of a shark of this kind from a freshwater deposit (Sweetman & Underwood, 2006).

Work to describe this remarkable assemblage continues and we look forward to more additions to the Wealden species list!

References


Sweetman, S. C. 2006b. The tetrapod microbiota of the Wealden Formation (Lower Cretaceous, Barremian) of the Isle of Wight, UK. In: Barrett,


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Fig. 2. Albanerpetontid bones (the abanerpetontids are superficially salamander-like amphibians). A, premaxilla; B, maxilla; C, dentary; D, partial and; E, substantially complete fused frontals; F, humerus.

Fig. 3. Frog ilea (part of the pelvic girdle).

Fig. 4. Lizard premaxillae.

Fig. 5. Dentary and teeth of a new species of the scincomorph lizard *Meyasaurus*. 
Fig. 6. Crocodile tooth with serrated carinae.

Fig. 7. Istiodactylid pterosaur teeth.

Fig. 8. Minute ornithischian dinosaur tooth.

Fig. 9. Velociraptorine dromaeosaurid tooth.

Fig. 10. Troodontid teeth.

Fig. 11. X-ray of the spalacolestine spalacotheriid mammal jaw.
Fig. 12. Life on the floodplain in Wessex Formation times. Reconstruction by Mark Witton, University of Portsmouth

Fig. 13. View of the Wessex and overlying Vectis Formations exposed to the south-east of Barnes High on the south-west coast of the Isle of Wight.
More news from the Isle of Wight

Numerous blocks of a thin shelly limestone can be found on the beach at the start of the section from Shepherd’s Chine to Atherfield Point on the south-west coast of the Isle of Wight. These blocks are normally rich in the fossilised shells of bivalves, and quite often also contain scales, teeth or fragments of bone, mostly from fish or shark, but more rarely from reptiles. The blocks themselves form a band within the Shepherds Chine Member, a unit within the Vectis Formation, but weathering of the cliffs ensures a continuous supply of these blocks on the beach.

Whilst on an HF Holidays geological excursion to Shepherd’s Chine, led by Ken Brooks in July 2008, Tess Ormrod found a small block of this limestone containing a number of bones (Fig. 1). Steve Hutt, of Dinosaur Isle in Sandown identified the bones as being pterosaur, and Lorna Steel, a pterosaur expert at the Natural History Museum, London, has confirmed that the fossil is the distal forelimb of a pterosaur. Lorna said that it looked similar to *Istiodactylus latidens* but is smaller than any known specimen, so could be either a juvenile, of which there are no known specimens, or a new species. It was also felt that there was a possibility of soft tissue preservation (black areas in fig. 1), and also more bones inside the block, an issue which it was hoped to resolve by x-raying the specimen. Tess has kindly donated the specimen to the Natural History Museum, and we await the results of their investigations.

Further along the south-west coast at Brook, Andrew Cocks found an unusual plant fossil during the summer of 2008. The fossil (Fig. 2) looks very similar to *Bucklandia*, the stem of a bennettitale, known mainly from the coastal section east of Hastings (Watson & Sincock, 1992).

During 2009 on the south-east coast at Yaverland, two separate discoveries revealed a complete skull of the diminuative Wealden crocodile *Bernissartia*. Diane Angwin and her family first brought the rear part of the skull into the museum for identification, and then later in the year Austin and Finlay Nathan found the front part of the skull whilst on a public fossil walk with Steve Hutt. The complete skull (Fig. 3) is about 13 cm long.

References
Exhibitions at Dinosaur Isle
Dinosaur Isle (Sandown, Isle of Wight) hosted two main exhibitions during 2009. The first featured *Hypsilophodon foxii*, the small, agile, plant-eating dinosaur that is unique to the Isle of Wight. The exhibition featured display boards telling the story of the discovery, naming and interpretation of *Hypsilophodon* along with both reconstructions and skeletons. Figure 4 is of a juvenile *Hypsilophodon* found by Nick Chase and figure 5 is of a larger specimen found by Mick Green. Also on display was a reconstructed three-dimensional skull (Fig. 6) of *Hypsilophodon* which had been found by Eric Milsom and Steve Hutt, and reconstructed by Gary Blackwell (all museum staff).

The second exhibition featured the paintings and

Fig. 4 Skeleton of juvenile Hypsilophodon foxii found by Nick Chase.

Photo: Peter Austen

Fig. 5 Skeleton of Hypsilophodon foxii found by Mick Green.

Photo: Peter Austen
artwork of John Sibbick, including the drawings and diagrams he prepares before undertaking a painting. John is one of the world’s leading illustrators of prehistoric landscapes, fauna and flora, and his artwork can be seen in many museums and books. Two of his classic Wealden reconstructions, *Iguanodon* and *Baryonyx*, are featured in the Palaeontological Association publication *Dinosaurs of the Isle of Wight* (Martill & Naish, 2001, plates 9 & 11).

During 2010 staff and volunteers from Dinosaur Isle will be reconstructing part of a skeleton of a very large *Iguanodon*. The skeleton was found a number of years ago by Nick Chase who has donated it to the museum. During the year visitors to the museum will be able to see the work being carried out on the skeleton, including preparation, fabrication of the missing bones and the construction of the skeleton.

References
Vertebrate fauna from Ashdown Brickworks, Bexhill, East Sussex
by Peter Austen, David Brockhurst and Kerri Honeysett

Over the past 20 years Ashdown Brickworks has yielded an impressive array of vertebrate material. Ashdown Brickworks is situated adjacent to Turkey Road, northwest of Bexhill, East Sussex at TQ 720 095 and comprises two separate pits. The more southerly, Crowborough Pit, exposes a sequence of the Lower Tunbridge Wells Sands, and the more northerly, Pevensey Pit, exposes a sequence of the Wadhurst Clay and is capped by the base of the Lower Tunbridge Wells Sands. The two pits are separated by the Whydown Fault which runs E-W through the pit complex. Below is the abstract from Hayward’s 1996 study at Ashdown Brickworks:

“A detailed study of part of the Wadhurst Formation and part of the Tunbridge Wells Formation was carried out in the Pevensey Pit at the Ashdown Works of Redland Bricks Ltd. The section comprised clays, siltstones and sandstones with occasional subordinate limestones, ironstones and pebble beds. The fauna was dominated by Cypridea ostracods and Neomiodon bivalves. It is thought that this predominance, in conjunction with the associated sediment types, plant remains, reptilian, shark and teleost macrofossils, indicate a shallow, freshwater environment with a slowly moving permanent body of water, the quiescence of which was spasmodically punctuated by fires and storm events. The main lithological units and the various species of Cypridea found within the section allow for tentative correlations to be made with boreholes in the surrounding area and allow the section to be placed within the Cypridea bispinosa Subzone of Horne, 1995. The overall palaeoenvironment fits in well with the model proposed by Allen in 1981, as being part of a large braided flood plain, albeit with the local facies varying through time. The palaeoenvironment is believed to be analogous with that seen in the present Okavango Delta, Botswana.”

Although fossil vertebrate material was recovered during Hayward’s study, since 1997 one of the authors, David Brockhurst, an employee of Ashdown Brickworks, has accumulated a large collection of vertebrate fossils, most of which are now housed in Bexhill Museum. It is an important collection containing a number of new species, as well as a number of species new to the Lower Cretaceous Hastings Beds. David has occasionally been assisted by a small group of friends (see Acknowledgements), but all of the specimens illustrated in the following pages have been found by him.

The vertebrate material included in this article has all been recovered from three main beds within the Wadhurst Clay of the Pevensey Pit. There is a distinct sandstone unit within the Pevensey Pit, the Northiam Sandstone (a 2-3 metre thick unit within the Wadhurst Clay), the top of which lies around 16 metres below the boundary between the Wadhurst Clay and the Tunbridge Wells Sand. The three beds can be correlated in relation to this Northiam Sandstone unit.

The lowest bed is the ‘Turtle bed’, a bone bed which lies 8-9 metres below the base of the Northiam Sandstone, and mainly produces the remains of turtles and crocodiles (Fig. 29). This bed is normally between 5 and 10 mm thick, but can be as much as 30 mm thick.

The next bed is the ‘Conglomerate bed’, a bone bed which is 5-6 cm thick and lies around 4 metres below the base of the Northiam Sandstone. It mainly produces small vertebrate material representing chondrichthyan and osteichthyan fishes (Fig. 44), salamanders (Figs 40 & 41), aigialosaurs (Fig. 43), turtles (Fig. 38), crocodiles (Figs 31-37), ornithischian dinosaurs including ‘Iguanodon’ (Fig. 5) a genus recently the subject of taxonomic review (Paul, 2006, 2008; Galton, 2009), Polacanthus (Figs 18 & 19) and Hylaeosaurus (Fig. 20) and theropods (Figs 25 & 26) – more than 100 iguanodont teeth have been recovered from this bed. This bed also has an unusually large accumulation of material representing the small crocodilian Bernissartia (Figs 31-35), and has also produced the first teeth ever to be found on mainland UK of the armoured dinosaur, Polacanthus (Figs 18 & 19) (Blows & Honeysett, in preparation). This bed also has a number of smaller beds associated with it. A number of specimens have been found on the platform on which the ‘Conglomerate bed’ lies – this platform is transitional between the underlying clays and the ‘Conglomerate bed’ itself and has produced lizard (Fig. 39), plesiosaur (Fig. 42), pterosaur (Fig. 27) and theropod remains (Fig. 22 (right)). About 30-40 cm above the ‘Conglomerate bed’ there is an intermittent black band about 2 cm thick which has produced theropod teeth (Fig. 21) and vertebræ (Fig. 23), and just above this is an intermittent siltstone bed around 10 cm thick which has produced pterosaur remains (Fig. 28).

The highest of the three main beds is the ‘Polacanthus bed’ (Fig. 1) which is between 45 and 60 cm thick and lies 11-12 metres above the top of the Northiam Sandstone, although access to this bed, which is situated on the boundary of the pit, has been lost following the construction of an internal roadway. As the name implies, a section of this bed has produced significant remains of a single Polacanthus (Figs 12-17), including five vertebræ (Fig. 12), a
Since Hayward’s study, as well as the extensive new vertebrate material from the Wadhurst Clay, plant remains have been discovered within the Northiam Sandstone (a unit within the Wadhurst Clay), including abundant sporocarps of the Mesozoic quillwort *Nathorstiana*. These had previously only been recorded from *in situ* beds in the Ashdown Formation at Cliff End, east of Hastings (Thomas & Batten, 2001). Other finds from the Northiam Sandstone include conchostracans (clam shrimps), beetle elytra and caddis cases.

As well as a paper on the *Polacanthus* remains (Figs 12-19), including the teeth (Figs 18 & 19) (Blows & Honeysett, in preparation), a further paper is planned for the ‘*Iguanodon*’ remains from the ‘Polacanthus bed’ (Figs 2-4 & 6-11). Steve Sweetman (University of Portsmouth), who has done some remarkable work on the microvertebrates of the Isle of Wight (see page 6 of this issue), has taken samples of the ‘Conglomerate bed’ for drying and sieving to look for microvertebrate remains – initial findings show that salamander vertebrae (e.g. Figs 40 & 41), possibly representing more than one species, are abundant. Teeth of hybodont sharks previously unrecorded from the pit have also been recovered and his samples also contain what appear to be eggshell fragments. With a colleague from the University of Portsmouth he is also currently preparing for publication a description of a cervical vertebra (Fig. 26) representing a new, small Wealden theropod (pers.comm. Steve Sweetman).

**Species list**

**Dinosaurs**

Saurischian Dinosaurs (‘lizard-hipped’)

- **Theropods**
  - *Baryonyx walkeri* (Fig. 21)
  - Allosauroid (Fig. 22)
  - *Ornithodesmus* sp. (Fig. 23)
  - Velociraptorian (Fig. 24)
  - Indeterminate carnosaur (Fig. 25)
  - Indeterminate theropod (Fig. 26)

- **?Sauropods**
  - Only *ex situ* gastroliths found

Ornithischian Dinosaurs (‘bird-hipped’)

- **Ornithopod Dinosaurs (mostly bipedal)**
  - *Iguanodon* sp. (Fig. 2 to Fig. 11)

- **Thyreophoran Dinosaurs (armoured dinosaurs)**
  - *Polacanthus* sp. (Fig. 12 to Fig. 19)
  - *Hylaeosaurus* sp. (Fig. 20)

**Pterosaurs**

- Indeterminate ornithocheirid (Fig. 27)
- Indeterminate bone fragment (Fig. 28)

**Crocodiles**

- Goniopholididae
  - *Goniopholis* sp. (Fig. 29)
Atoposauridae
Theriosuchus pusillus (Fig. 37)
Theriosuchus sp. (Fig. 36)
Bernissartiidae
Bernissartia sp. (Fig. 30 to Fig. 35)

Turtle
Tretosternon bakewelli (Fig. 38)

Marine Reptile
Plesiosaur (Fig. 42)

Lizards
Aigialosaur (Fig. 43)
Scincomorph (Fig. 39)

Amphibians
Unidentified salamanders (Fig. 40 and Fig. 41)

Osteichthyan fishes
Pachythrissops sp.
Neorhombelepis sp.
Coelodus sp.
Lepidotes mantelli (Fig. 44)

Chondrichthyan fishes (sharks)
Hybodonts
Hybodus basanus
Hybodus ensis
Hybodus parvidens
Hybodus brevicostatus
Lonchidion breve breve
Lonchidion sp.

Unidentified fish or reptile (Fig. 45)

All enquiries about the site and the fossil material recovered from it should be addressed to David Brockhurst at brockhurstfamily@hotmail.com or phone 07845 935037.

Footnote
*In all cases the 50p coin used for scale is the smaller post-1996 coin with a diameter of 27.3mm at its widest point.

Acknowledgements
The authors would like to thank the following people who have either assisted in the recovery of the fossil remains or contributed to research – William Blows, Luke Booth, Ken Brooks, Mark Denison, Siân Evans, Jim Gardner (Royal Tyrrell Museum, Alberta, Canada), Steve Honeysett, Conrad Lee-White, David Miles, Andy Ottaway, Julian Porter (Bexhill Museum, UK) and Steve Sweetman (University of Portsmouth, UK). We would also like to thank Angela Milner of the Natural History Museum (NHM) for her patience in identifying many of the specimens, and to Paul Barrett (NHM), William Blows and Steve Sweetman, who have also offered advice on identification, although any errors are ours. We would also like to thank the staff and management at Ashdown Brickworks for allowing access to the site and for their continued assistance and co-operation.

References
Fig. 2. String of four ‘Iguanodon’ caudal vertebrae found in situ. (Maximum horizontal length of centra 49 cm.)
Horizon: ‘Polacanthus bed’

Fig. 3. ‘Iguanodon’ caudal vertebra. (Maximum horizontal length of centrum 8 cm.)
Horizon: ‘Polacanthus bed’

Fig. 4. ‘Iguanodon’ tail vertebra. (Maximum horizontal length of centrum 4 cm.)
Horizon: ‘Polacanthus bed’
Fig. 5. Juvenile ‘Iguanodon’ vertebra. (Maximum horizontal width of centrum 3.5 cm.)
Horizon: ‘Conglomerate bed’
Photo: Peter Austen

Fig. 6. ‘Iguanodon’ chevron. (Length of section 17 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 7. ‘Iguanodon’ sacral rib. (Maximum horizontal length of section 17 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 8. ‘Iguanodon’ rib. (Length of section 18.5 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 9. ‘Iguanodon’ phalanges. (Maximum horizontal length of specimen 20 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 10. ‘Iguanodon’ tooth. (50p coin* for scale)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway
Fig. 11. ‘Iguanodon’ bone with pathology (bone has been broken and has subsequently healed). (Maximum horizontal width of section 16.5 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 12. Polacanthus caudal vertebra. (Diameter of centrum 8 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 13. Polacanthus spike. (Length of spike 33 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 14. Polacanthus dermal scute. (Maximum horizontal length of scute 6.5 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 15. Polacanthus ilium. (Maximum horizontal length of section 30.5 cm.)
Horizon: ‘Polacanthus bed’
Photo: Kerri Honeysett

Fig. 16. Polacanthus limb bone. (Length of bone 31 cm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway
Fig. 17. Polacanthus phalange.  
(Maximum horizontal length of phalange 5 cm.)  
Horizon: ‘Polacanthus bed’  
Photo: Peter Holloway

Fig. 18. Polacanthus tooth.  (50p coin* for scale)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 19. Close up of crown of Polacanthus tooth in fig. 18.  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 20. Hylaeosaurus caudal vertebra.  
(Diameter of centrum 12 cm.)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 21. Baryonyx tooth.  (50p coin* for scale)  
(Distinguished from Goniopholis (Fig. 29) by its characteristic tightly packed serrations.)  
Horizon: Black band above ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 22. Allosauroid teeth.  (All scale divisions 0.5mm)  
Left - length of tooth (top left) 2.7 cm. - close up (bottom left) shows clear serrations.  
Horizon: ‘Polacanthus bed’  
Photos: Peter Holloway  
Right - length of tooth 4.3 cm.  
Horizon: Platform below ‘Conglomerate bed’  
Photo: Kerri Honeysett
Fig. 23. Ornithodesmus cervical vertebra (two views of same specimen). (Maximum horizontal length of centra 7 mm.)
Horizon: Black band above ‘Conglomerate bed’  
Photos: Peter Austen

Fig. 24. Velociraptorine tooth.  
(Scale divisions 0.5mm. - length of tooth 9 mm.)
Horizon: ‘Polacanthus bed’  
Photo: Peter Holloway

Fig. 25. Indeterminate carnosaur tooth.  
(Scale divisions 0.5mm. - length of tooth 3 cm.)
Horizon: ‘Conglomerate bed’  
Photo: Kerri Honeysett

Fig. 26. Cervical vertebra of a new small Wealden theropod (two views of same specimen).  
Horizon: ‘Conglomerate bed’  
Photos: Steve Sweetman

Fig. 27. Pterosaur tooth (indeterminate ornithocheirid). (cm. rule for scale)
Horizon: Platform below ‘Conglomerate bed’  
Photo: Peter Austen

Fig. 28. Pterosaur bone (indeterminate). (cm. rule for scale)  
Horizon: Siltstone bed above ‘Conglomerate bed’  
Photo: Peter Austen
Fig. 29. Goniopholis tooth. (Length of tooth 1.8 cm.)
Horizon: ‘Turtle bed’
Photo: Peter Holloway

Fig. 30. Crocodile vertebra, possibly Bernissartia.
(Diameter of centrum 17 mm.)
Horizon: ‘Polacanthus bed’
Photo: Peter Holloway

Fig. 31. Section of Bernissartia skull. (50p coin* for scale)
Horizon: ‘Conglomerate bed’
Photo: Peter Holloway

Fig. 32. Section of Bernissartia skull.
(opposite side of fig. 31). (50p coin* for scale)
Horizon: ‘Conglomerate bed’
Photo: Peter Holloway

Fig. 33. Bernissartia tooth. (50p coin* for scale)
Horizon: ‘Conglomerate bed’
Photo: Peter Holloway

Fig. 34. Crocodile metacarpal, possibly Bernissartia.
(Length of bone 3 cm.)
Horizon: ‘Conglomerate bed’
Photo: Peter Holloway
Fig. 35. Bernissartia ungal phalange.  
(Scale divisions 0.5mm. for scale)  
Horizon: ‘Conglomerate bed’  
Photo: Kerri Honeysett

Fig. 36. Theriosuchus teeth.  
Horizon: ‘Conglomerate bed’  
Photo: David Brockhurst

Fig. 37. Theriosuchus pusillus (maxilla).  
(Maximum horizontal length of section 19 mm.)  
Horizon: ‘Conglomerate bed’  
Photo: David Brockhurst

Fig. 38. Section of Tretosternon turtle carapace.  
(Maximum horizontal width of carapace 5.2 cm.)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 39. Scincomorph lizard jaw.  
(Scale divisions 0.5mm. - length of jaw 12.5 mm.)  
Horizon: Platform below ‘Conglomerate bed’  
Photo: Kerri Honeysett

Fig. 40. Salamander atlas vertebrae.  
(Scale divisions 0.5mm.)  
Horizon: ‘Conglomerate bed’  
Photo: Kerri Honeysett
Fig. 41. *Salamander* atlas vertebrae. (50p coin* for scale)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 42. *Plesiosaur* vertebra.  
(Maximum horizontal width of centrum 3.2 cm.)  
Horizon: Platform below ‘Conglomerate bed’  
Photo: Peter Holloway

Fig. 43. Sections of *Aigialosaur* jaw.  
(cm. rule for scale)  
Horizon: ‘Conglomerate bed’  
Photo: Kerri Honeysett

Fig. 44. *Lepidotes mantelli* teeth.  
(cm. rule for scale)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Austen

Fig. 45. Unidentified fish or reptile jaw.  
(Maximum horizontal length of section 8 mm.)  
Horizon: ‘Conglomerate bed’  
Photo: Peter Holloway
Cliff falls along the Hastings coastline

The 5-mile section of coast east of Hastings from Rock-a-Nore to Cliff End is frequently subject to cliff falls, particularly after periods of wet weather, but because of their sudden nature they are rarely caught on camera. On this page are two photographs of a spectacular fall from the cliffs just east of Ecclesbourne Glen taken by David Burr of Burwash. The photos were taken by Mr Burr from Rock-a-Nore car park on the morning of 18th December 2009. Mr Burr said that initially there was what looked like an explosion about two thirds of the way up the cliff but there was no sound. The coastguard were called, but no-one was hurt in the fall.

On the following two pages is an article and photographs by David Talbot who captured a cliff fall at Cliff End on the opposite end of this 5-mile section of coastline. David Talbot’s photo of the actual ‘fall’ (Fig. 4) won him a ‘Popular Vote’ prize at the OUGS Myra Eldridge Photo Competition in 2008.

Both sets of photos also serve as a warning to geologists traversing these coastal sections to be ever vigilant.
Cliff fall at Cliff End, East Sussex – 30th January 2007  
by Dave Talbot (Medway Lapidary and Mineral Society)

This was already my second trip to the area in 10 days, the first had been to do some photography and this was to collect some more rock samples, but I also took my camera for any further photo opportunities.

The reason for these forays was to collect as much information as possible for a rock and photographic collection of the various sediments of the cliffs between Cliff End, at Pett Level, and Haddock’s Reverse Fault, at Fairlight Cove, about 800 metres to the west. This is a project I am attempting after working on the Wealden Rock Collection CD-Rom with colleagues from the Medway Society back in 2000 (Day, et al., 2004). I have currently divided the cliffs into 34 separate layers, although this may change.

There was a light wind blowing, the tide was on the way out and the weather a bit overcast; I was expecting to stay about 4 hours. Sometimes when I get here I think I’ll walk straight to the far end of the cliffs at Haddock’s Reverse Fault and then take a slow walk back to Pett, checking the foreshore for different rocks and trace fossils on the way back. It never happens, as there is always something of interest on the way out, and that means I always take my time from the moment I step onto the shingle at Cliff End, until the moment I return (I’ve never tried, or had to get off the beach from the far end at Fairlight Cove – there is a route, but this is getting somewhat degraded).

Today was no exception as I sauntered along the beach looking at various rocks and forms within them, and taking more photos as well. After searching around a bit, slowly getting to Haddock’s Reverse Fault, I came across a fairly recent cliff fall (Fig. 1) from the Cliff End Sandstone (CES), probably that morning. At the time I didn’t think too much about it, just that I would collect some rock samples on the way back for my collection.

I took a photo of this initial fall on first seeing it. When I returned about an hour or so later, I started to look around for some samples, but soon moved away as a small section fell away from the ironstone band that separates the Ashdown from the Wadhurst Formations. I began to think I might see a larger fall if I stayed around long enough. I positioned myself away from this initial fall and waited, camera now at the ready. As I watched, more pieces were falling away and at times I was able to catch this on frame, in free-fall (Fig. 2).

The cliffs here are about 25-28 metres high – the bottom half is the Ashdown Sandstone and the top half is the Wadhurst Clay. These are nearly all sandstones or siltstones of the Lower Cretaceous...
Hastings Group and are separated by an ironstone band that stretches across the Weald; the CES above the ironstone is a 10 metre thick sandy unit of the Wadhurst Clay.

As I watched the cliff more and more rocks were falling, the unconsolidated sand of the CES making it appear like a waterfall (Fig. 3). All of a sudden the whole section started to drop (Fig. 4), and in no time at all it was all over, a cloud of dust rolled toward me, but gradually abated, looking misty (Fig. 5), and smelling musty, of earth. My heart was beating like a drum – where I had positioned myself I was OK, but you never know! I took some more photos of the cliff face and the pile of rubble on the beach. Where there had been clean washed shingle there was now a cluttered mess of roots, soil and rock.

There was not another soul in sight! I hadn’t got a hard hat, although I don’t think it would have been of much use under that lot. I had a mobile phone, but that does not work near the cliffs as there is no signal.

I have visited this area many times over the last 15 years and have seen the aftermath of many falls but this is the first time I’ve ever seen this erosion in action – quite magnificent.

References

A version of this article was first published in Down to Earth (No.62, Feb 2008, p.16-17) and the Hastings & District Geological Society Journal (Vol. 14, December 2008, p.28-29). It can also be viewed on the Kent Geologists’ Group website at http://www.kgg.org.uk/ - click on “Fragments” and go to “Rock Fall”.

Fig. 3

Fig. 4

Fig. 5
Lepidotes from Bulverhythe

Remains of the Wealden fish *Lepidotes* are quite common in Wealden deposits, but they are normally represented by isolated teeth and scales, and more rarely palates showing several teeth. The remarkable specimen shown below was found in blue-grey clay on the beach at Bulverhythe, near Bexhill, in May 2008 (Brooks, 2008). It’s likely that on death the fish was buried rapidly and preserved as a diagenetic nodule, and subsequent exposure and erosion of the nodule left part of the head and body clearly visible. The specimen was prepared by John Dempsey at his ‘Fossil Farm’ workshop and is now on display in the Shipwreck Heritage and Coastal Centre in Hastings Old Town as part of its permanent display of local geology and fossils.

**References**


*Head and part of the body of the Wealden fish Lepidotes mantelli.*

*Lepidotes mantelli from above*
Smokejacks fieldwork 2007-2009

There have been a total of fifteen fieldtrips to Smokejacks during the period 2007-2009. Unfortunately the pit had to suspend its main brick-making operation in July 2008 due to the recession and the resultant reduction in demand, although a few people are still employed in the production of ‘specials’. In terms of the geology this has meant that the last time there was a scrape at the pit (and the consequent fresh exposures) was Spring 2008. There has, however, been a number of interesting finds over this period.

The pit lies near the base of the Upper Weald Clay (Lower Barremian) and exposes 23m of sediments, the top 10m representing mudflats and sluggish river channels, and the bottom 13m a shallow lake or lagoon with fluctuating salinity (Ross & Cook, 1995). On the April 2007 fieldtrip Don Anderson found some excellent slabs of the fern *Weichselia* (Fig. 1), one of them displaying reproductive structures (Figs 2 & 3). Don found these specimens at the foot of the 13m section on the north-east face. They were not *in situ*, but were possibly from just above bed NW 2 of Ross & Cook’s (1995) annotated log, as *Weichselia* material is quite common at this horizon. This was an extremely rare find, as reproductive structures of *Weichselia* are not common in the English Wealden. Don Anderson writes:

“The specimens include parts of fertile fronds, as well as sterile pinnae. Unfortunately the fertile pinnae are not complete, consisting of nude ultimate rachises, and with the little round groups of soral clusters detached from them. However the clusters are in perfect condition and look exactly like those illustrated in Diez et al. (2005) (p.103, pl.1), so there can be no doubt about what they are. Also because the material is preserved as fusain (charcoal) the preservation quality is excellent.”

Don also says that the *Weichselia* reproductive structures are quite common around Europe, although neither of us are aware of any being found in the English Wealden. We would welcome any records from the English Wealden – I will include details in the next Wealden News (please e-mail any information on English Wealden *Weichselia* reproductive structures to Peter Austen at p.austen26@btinternet.com).

Also recovered from the north-east face by Nick Hawes of the Sussex Mineral & Lapidary Society (SMLS) were remains of the enigmatic ‘flowering plant’ *Bevhalstia* preserved in the soft clays (Fig. 4). This is quite unusual as fossils of *Bevhalstia* normally consist of stems and fragments of veined leaves, preserved as impressions in fine-grained clay ironstones and siltstones, with very little preservation of original organic matter. The manner in which the plant preserves and the way in which the rock fractures means that we have never found a complete leaf (Austen, 2008) – figure 26 in *Wealden News* No.7 (Austen, 2007) shows one of the best preserved leaves recovered to date. However, when preserved in the soft clays, their outline can be clearly seen (Fig. 4), possibly the result of differential oxidation/mineralisation.

Whilst on *Bevhalstia*, further work was published in 2008 (Nye, et al., 2008). In July 2001 on the Geologists’ Association fieldtrip to Smokejacks, the partial skeleton of a juvenile *Iguanodon* had been discovered and was subsequently excavated by a team from the Natural History Museum (Austen, 2001, 2005). It was one of the most complete and best preserved specimens of *Iguanodon* to come out of the Weald Clay, but as an added bonus whilst excavating the skeleton the Natural History Museum undertook a detailed analysis of the palynology and micro-palaeontology of the sediments in a 10m section surrounding the skeleton. The study, which was published in 2008 (Nye, et al., 2008), discovered four types of angiosperm pollen (*Retimnocolpites* sp. 1, 2, 3 & 4) (Fig. 6 G to J in Nye et al., 2008) all with a similar structure and size to that produced by species within the lily family. The authors suggested that *Bevhalstia pebja* could possibly have been the parent plant of this pollen, this being the only angiosperm-like plant known from the Weald in SE England or other Barremian localities (Austen, 2008). The paper also contained an updated lithological log for a 10m section above and below the level where the *Iguanodon* was discovered.

Other interesting finds on the north-east face included the well-preserved root of a cephalic spine from a hybodont shark (Figs 5 & 6) found by Brian Craik-Smith of the SMLS; pterosaur bones and a number of insects, including an *ex situ* cicada-like bug wing (Fig. 7) found by Joyce Austen. This wing (Fig. 7) was similar to *Valdicossus chesteri*, a recently described Palaeontinidae (Insecta: Hemiptera: Cicadomorpha) from the Wealden of Cooden, East Sussex (Wang et al., 2008) (Ed Jarzembowski – pers.comm.). Terry Keenan also found an *ex situ* hopper tegmen (modified protective forewing, not used for flapping and stiff in flight like aircraft wings) on this face (Fig. 8).

On the April 2009 fieldtrip, members of the Isle of Wight Geological Society (IOWGS) worked on the gulley at the top of the south-west face. Andrew Cox recovered a number of dinosaur footprints (Figs 9, 10 & 11) from the underside of a ledge 3 metres above the bed where an *Iguanodon* was found in 2001 (and *Baryonyx* in 1983) (i.e. 3 metres above the dinoturbated bed 18 SE of Ross & Cook’s (1995) annotated log). Two of the footcasts were
Iguanodontid (Iguanodontipus isp.) (Figs 10 & 11) and one was theropod (Fig. 9). The theropod footcast (Fig. 9) was pointing into the ledge in a roughly easterly direction (Jarzembowski et al., 2009). Shaun Smith of the IOWGS also recovered two cones inside separate sandstone blocks (Figs 12 & 13) from the beds just above this ledge.

Crocodile teeth were also recovered from near the top of the pit adjacent to the north-east face by Barry Jackson of the Horsham & District Geological Society.

Acknowledgements
Our thanks to all the management and staff at Smokejacks for their assistance and for allowing continued access.

References
Fig. 4. Outline of the Wealden ‘flowering plant’ Bevhalstia preserved unusually in soft clay (scale in cm).

Photo: Peter Austen

Fig. 5. Root of a cephalic spine from a hybodont shark (scale in cm).

Photo: Peter Austen

Fig. 6. Another view of cephalic spine in fig. 5.

Photo: Peter Austen

Fig. 7. Cicada-like bug wing.

Photo: Peter Austen

Fig. 8. Hopper tegmen (right) and impression of partial Bevhalstia leaf (left).

Photo: Terry Keenan

Fig. 9. Theropod footcast from a gulley near the top of the south-west face of the pit (10cm scale bar).

Photo: Peter Austen
Wealden News No.8, February 2010

Fig. 10. Iguanodontid footcast (Iguanodontipus isp.) from a gulley near the top of the south-west face of the pit (10cm scale bar).

Photo: Peter Austen

Fig. 11. Iguanodontid footcast (Iguanodontipus isp.) from a gulley near the top of the south-west face of the pit (10cm scale bar).

Photo: Peter Austen

Fig. 12. Cast of fossil cone in a sandstone block from the south-west face of the pit (scale in cm).

Photo: Peter Austen

Fig. 13. Cast of fossil cone in a sandstone block from the south-west face of the pit (scale in cm).

Photo: Peter Austen

Weald Research Committee - Part 2

In the last issue of Wealden News we printed the menus from the first two anniversary dinners (1924 and 1925) of the then newly-formed Weald Research Committee, demonstrating a sharp sense of humour (Anon., 2007). On the following pages are the front plates from the 1938 and 1939 menus, continuing that theme.

Thanks again to Richard Agar for supplying the menus.

References

(http://www.kentrigs.org.uk/wealden.html)
“A bit rocky on these anticlines, Mr. Mate!”
“Aye, aye, sir. But it’ll give us a good appetite for something I can see through my Dinocochlea spy-glass!”
W.R.C.
14th.
ANNUAL
DINNER
JAN.21st.’39.

HOG’S BACK
AND
HINDHEAD

ADUR,
showing
profile.
(Traced
from
H. M.
Survey’s
portrait)

SUSSEX MARBLE,
showing superposition
of Togeys on Alley Tors

FOLK

FOLKSTONE BEDS, with
current-bedding.

BOGNOR
ROCK

KENTISH
RAG

LYDITE in early
stage of formation.

HASSOCK

HAStINGS BEDS

A = Upper Chalk
B = Middle Chalk
C = Lower Chalk

[1 min. from sea. Ammonite’s
thrown fr. sta. Every convenience
(not shown). h & c. Terms mod.]
Wealden update

The following report was originally published in the GA (Magazine of the Geologists' Association) (Austen et al., 2008, 2009) but due to lack of space was not included in full. We’ve therefore taken this opportunity to reprint the whole article with updates.

References


P.A. Austen, E.A. Jarzembowski, G. Toye, R. Agar & T.J. Keenan

25 people and a dog assembled at 1030 at Langhurst Wood Road Pit, Warnham, on a warm but cloudy morning. Peter Austen gave an introductory talk explaining the stratigraphy of the site (see Toye et al., 2005), and showing illustrations of otoliths (fish ear stones) (Anon., 2005 & Toye et al., 2005), and an illustration of a small fish jaw (Fig. 1) found by Barbara Loney on a recent Horsham Geological Field Club (HGFC) visit to the site – this jaw was identified by Ed Jarzembowski as that of a small predatory fish. The party then went to look at a pile of large scour fills (for which Warnham is famous: Toye et al., 2005) stock-piled by the workmen near the entrance (Fig. 2). These showed fine sole structures including circular groove marks (Fig. 3) and even eroded ripples. The party then went down into the main pit where over five metres more Lower Weald Clay was exposed in the base of the pit since the section was measured by Styles (2000). Finds included phosphatic nodules and shaley mudstones with partings crammed with fish bones. A siltstone lenticle near the base of BGS Bed 2a in the north-east corner of the pit yielded beetle (Coleoptera) remains. The wing case of a cupedid beetle Zygadenia sp. (Fig. 4) and a scorpionfly wing base (Fig. 5), probably a new species, had also been found in the pit by Terry Keenan on the recent HGFC visit to the site, although these were not in situ. Just below a bed of Paludina Limestone at Styles’s bed 10 (Styles, 2000), Mike Smith found a tooth plate, possibly a dentary from the lower left jaw of a Lepidotes mantelli (Fig. 6). Geoff Toye had previously found a partial Lepidotes palate (Fig. 7) in the same bed. Fish remains and a small fish jaw with teeth (Fig. 8) were found in an excavation by Stephanie & Andy Crawte just below BGS Bed 2a. Also found in the pit were comminuted plant debris, molluscs (in Cyrena and Paludina limestones), gutter casts and ironstone nodules.

After lunch, the party drove to Clockhouse Brickworks where Richard Agar gave an introductory talk on the site (see Toye et al., 2005) before investigating the northern part of the current workings to the NE of the works where BGS beds 3a and 3 were clearly visible. Grey clouds had gathered but the threatened storm failed to materialise. Insects were found by Ed & Biddy Jarzembowski in pale siltstones of Worssam’s Bed 26 (Fig. 9). These were fragmentary, including true flies, cockroachoids/cockroaches, beetles and the termite Valditermes brevaneae (Fig.10). A bug hindwing (Fig. 11), probably a new species, was also found by Joyce Austen ex situ in the base of the quarry. Worssam’s Bed 21 where abundant in situ otoliths had been found on the GA trip to the site in July 2006 (Jarzembowski et al., 2006) was not exposed, as it was covered in mud following flooding. Other finds included a pyritised reptile tail vertebra by Stephanie Crawte, a Viviparus shell infilled by ironstone by Theresa MacIntyre, and in the Clockhouse Sandstone (BGS Bed 3) Geoff Toye found an 11 cm section of bone (Fig. 12) which may be part of a pelvic girdle (GT), perhaps the distal end of an ornithopod ischium: alternatively it could be an iguanodontid proximal thoracic rib (Mark Wildman – pers. comm.).

Acknowledgements
Our thanks to Wienerberger and Hanson Brick for permission to visit Warnham and Clockhouse respectively.

References
Fig. 1 - Jaw of a small unidentified predatory fish - length of jaw is 2 mm.

Photo: Terry Keenan

Fig. 2 - Large scour fill stock-piled near quarry entrance - 2lb geological hammer for scale.

Photo: Ed Jarzembowski

Fig. 3 - Circular groove marks seen on large scour fill in figure 2 - cm ruler for scale.

Photo: Ed Jarzembowski

Fig. 4 – Wing case of a cupedid beetle Zygadenia sp., aligned with wood fragment, from Warnham - length of specimen is 17 mm.

Photo: Terry Keenan

Fig. 5 – Scorpionfly wing base showing colour patterning, probably a new species, from Warnham - length of specimen is 7.5 mm.

Photo: Terry Keenan

Fig. 6 - Tooth plate from Styles’s bed 17, possibly a dentary from the lower left jaw of a Lepidotes mantelli - length of specimen is 12 mm.

Photo: Mike Smith
Fig. 7 - Partial Lepidotes palate, also from Styles’s bed 17 - length of specimen is 2 cm.

Photo: Terry Keenan

Fig. 8 - Unidentified fish jaw with teeth, from just below BGS Bed 2a - length of specimen is 1 cm.

Photo: Peter Austen

Fig. 9 - Biddy Jarzembowski working on Worssam’s Bed 26, guarded by Rex.

Photo: Ed Jarzembowski

Fig. 10 – Fragment of a termite wing Valditermes brenanae, from Clockhouse - length of specimen is 4.5 mm.

Photo: Terry Keenan

Fig. 11 – Bug wing, probably a new species, from Clockhouse - length of specimen is 4.5 mm.

Photo: Terry Keenan

Fig. 12 - Section of bone from the Clockhouse Sandstone (BGS Bed 3) - scale bar in cm.

Photo: Mark Wildman
Mantell on Google Books

For those interested in historical aspects of the Weald, Google Books has uploaded five of Gideon Mantell’s books and papers containing information relating to the Weald. These are:


To access Google Books go to [http://books.google.com/](http://books.google.com/) click on ‘Advanced Book Search’, under ‘Search:’ choose ‘Full View Only’, type ‘Mantell’ into the ‘Author’ field, and then click on ‘Google Search’ – this will bring up most of Mantell’s books where the full text is available.

If you have already downloaded these, larger files were uploaded in July 2009 on some of the titles, giving higher resolution pictures. One drawback, however, is that fold-outs within the publications are not always unfolded before scanning. Also all the titles may not appear on your initial search, but if you click on one of the titles and then click on ‘Related Books’ you will find additional titles. This is the only way to find ‘Geological Excursions round The Isle of Wight . . .’.

Other Wealden titles available online

Also available on Google Books are:


Also available on the Internet Archive are all three volumes of Christoph Giebel’s *Fauna of the World* (Giebel, 1847-48, 1852 & 1856), but as with Brodie for Wealden read Purbeck, and the text is in German. The volumes are available at [http://www.archive.org/](http://www.archive.org/). Type “Vorwelt” into the search engine and they will appear in the list of titles, but they are very large files (Vol.1 - 91MB, Vol.2 - 47MB, & Vol.3 - 83MB) and they contain no pictures. A 25MB version of Volume 2 is available on Google Books.

References


Part 1 (1847) - *(Die Säugethiere der Vorwelt)*, xi, 281 pp. [Mammals]

Part 2 (1847) - *(Die Vögel und Amphibien der Vorwelt)*, xi, 217 pp. [Birds and Amphibians]

Part 3 (1848) - *(Die Fische der Vorwelt)*, xii, 467 pp. [Fish]

Giebel, Christoph Gottfried Andreas. 1856. *Fauna der Vorwelt, mit steter Berücksichtigung der lebenden Thiere - Vol. 2 (Die Insecten und Spinnen der Vorwelt)*. Brockhaus, Leipzig, xviii, 511 pp. [Insects and Spiders]

Giebel, Christoph Gottfried Andreas. 1852. *Fauna der Vorwelt, mit steter Berücksichtigung der lebenden Thiere - Vol. 3 (Die Cephalopoden der Vorwelt)*. Brockhaus, Leipzig, xvi, 856 pp. [Cephalopods]

Topley (1875) available to read online

The classic 1875 memoir on the Weald by William Topley is available to read (but not download) online, supplied courtesy of American Libraries. You could also print all 541 pages, but only one page at a time! It’s available on the Internet Archive at [http://www.archive.org/](http://www.archive.org/). Type “Weald” into the search engine and it will appear as one of the titles.

Reference


Please send us details of any other Wealden works available online (including Wealden theses) and we will include them in the next Wealden News. Contact details on front page.
Publications
2007 and other earlier references in previous issues.

Newish journal articles - refereed


**Newish journal articles - others**


**Newsletters**


Please send us your publications for inclusion in the next *Wealden News*. See page 1 for contact details.
Fossil dragonfly (Valdaeshna surreyensis) after Lance Jones.
Wingspan about 92mm.

Fossil termite (Valditermes) restored by Neil Watson.
Wingspan about 21mm.

Taxonomic/Nomenclatural Disclaimer
This publication is not deemed to be valid for taxonomic/nomenclatural purposes.