

A NEW FAUNA FROM THE UPPER LYDITE BED (PORTLANDIAN), NEAR WHITCHURCH, BUCKINGHAMSHIRE

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The stratigraphic relations of the Portlandian Upper Lydite Bed are briefly assessed, and the provenance of its constituents discussed. A fauna recovered near Whitchurch, north of Aylesbury, suggests that normal marine salinities prevailed until early Glaucolithites glaucolithus times during the Kimmeridgian-Portlandian regression.

The Upper Lydite Bed is a thin pebbly horizon present at the base of the Upper Jurassic Portland Beds, traceable from Buckinghamshire to the Vale of Pewsey in Wiltshire. It rests uncomformably on a slightly folded surface of Upper Kimmeridgian strata of either *pallasioides* or *pectinatus* age. The *Pavlovia rotunda* and *Virgatopavlovia fittoni* zones of the Upper Kimmeridgian and the *Progalbanites albanus* zone of the Portlandian are absent, indicating an erosional phase of considerable duration.

Summary of the Portlandian Sequence in the Aylesbury District (in part after Wimbledon 1980)

	metres
Purbeck Limestone Formation (ammonites absent)	c. 10
Creamy Limestones (<i>Galbanites kerberus</i> zone)	2-5
Crendon Sand (<i>Galbanites kerberus</i> zone)	1-3
Aylesbury Limestone (<i>Galbanites okusensis</i> and <i>Galbanites kerberus</i> zones)	2-5
Glauconitic Beds (<i>Glaucolithites glaucolithus</i> and <i>Galbanites okusensis</i> zones)	1.5-8
Upper Lydite Bed (<i>Glaucolithites glaucolithus</i> zone)	c. 0.3

This sequence rests on slightly folded surface of Upper Kimmeridgian strata, comprising:

- Hartwell Clay (*Pavlovia pallasioides* zone)
- Thame Sand (*Pectinatites pectinatus* zone)

The Upper Lydite Bed contains abundant sub-rounded to well-rounded clasts of dark chert ('lydites') and quartz; and phosphatised fragments of Upper Kimmeridgian fossils and lithified sediment are commonly included.

The chert and quartz clasts were probably derived from Palaeozoic strata undergoing erosion on the western flanks of the nearby London-Ardenne landmass, and introduced into the sedimentary basin in late Kimmeridgian-early Portlandian times. The Upper Kimmeridgian elements are remnants of sediments laid down and subsequently eroded during the aforementioned time gap.

The clasts occur in a variety of matrix-types, ranging from limestones to sands and clays. All are characterised by the presence of glauconite. An indigenous fauna sometimes occurs, including *Glaucolithites glaucolithus* zone ammonites.

Recently, a roadside drainage ditch north of Whitchurch, near Aylesbury (SP 808 227) has exposed c. 30 cm of highly fossiliferous pebbly glauconitic micritic limestone (Fig. 1). An indigenous fauna has been recovered, and the

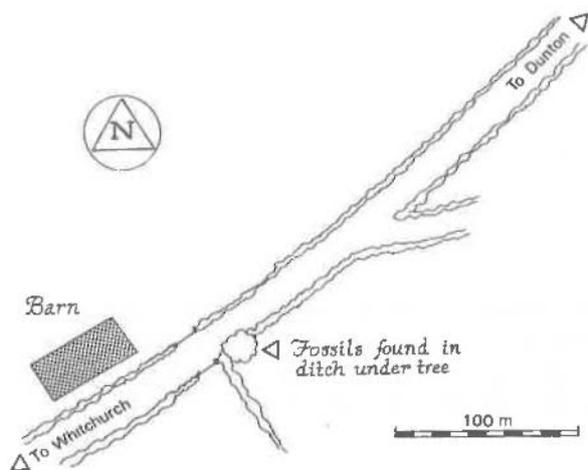


Fig. 1. Sketch map showing fossil locality.

following provisional identifications have been made.

Bivalves: *Nanogyra nana*; *Camptonectes* sp.; *Pholadomya* sp.; *Lopha* sp.; *Modiolus* sp.

Gastropod: *Aptyxiella portlandica*

Ammonite: *Glaucolithites* sp.

Brachiopod: *Rhynchonella portlandica*

Bryozoan: *Hyporosopora* sp. cf. *H. portlandica*

Crinoid: Ossicles of *Pentacrinus* sp.

Serpulid: *Glomerula gordialis*

Derived phosphatised ammonite fragments were found, probably referable to *Pavlovia* or allied forms. A fragmentary belemnite present may also have been derived.

N. nana is the most abundant bivalve, with *Modiolus* sp. known from a single specimen. Two examples of *R. portlandica* were found, one encrusted by a bryozoan. The serpulid was attached to a derived ammonite fragment, and

the crinoid ossicles were found on weathered surfaces of several blocks.

Discussion

The Portland Beds of southern England are well-known for their fauna dominated by large bivalves, which, although of shallow marine aspect, largely lack forms which only tolerate full marine salinities, such as brachiopods, belemnites or crinoids. This is explained by initiation of marine regression towards the south-west in Upper Kimmeridgian times. By early Portlandian times the sea had become rather landlocked, and abnormally high salinities subsequently occurred.

The presence of the brachiopod *R. portlandica* north of Whitchurch, and its earlier discovery in the Upper Lydite Bed at Long Crendon 17 km to the south-west (Childs 1969), suggests that near-normal marine salinities prevailed in the Buckinghamshire area at least until early *Glaucolithites glaucolithus* times, during deposition of the Upper Lydite Bed. The occurrence of crinoid ossicles also points to this conclusion.

The Glauconitic Beds above the Upper Lydite Bed are often of contrasting lithology, and no brachiopods or crinoid remains have been recorded in Buckinghamshire. Large molluscs are abundant in the Glauconitic Beds and higher units of the Buckinghamshire Portland Beds (see for instance Bristow and Kirkaldy 1962), but the bivalve genera *Pholadomya*, *Lopha* and *Modiolus* found at Whitchurch are rare or unrecorded.

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