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# Loch Scavaig, Skye and Lochalsh

[NG 519 165]

## Introduction

Many vertebrate fossils have been recovered from Middle Jurassic beds on Skye, including mammals, therapsids (*Stereognathus*), lizards and a choristodere skull. The mammal-producing site on Skye (unspecified locality UB7111) was originally not identified, but Waldman and Evans (1994) gave the map reference. The fossil-bearing unit occurs within the Kilmaluag Formation, formerly the Ostracod Limestones, on the northern side of Glen Scaladal, Elgol (Benton and Spencer, 1995; (Figure 2.13)). The Kilmaluag Formation forms part of the upper portion of the Great Estuarine Group, formerly the Great Estuarine Series (Andrews, 1985), and is of middle Bathonian age (Waldman and Savage, 1972). The site was discovered in August 1971 by M. Waldman and J.B. Dobinson (Waldman and Savage, 1972; Waldman and Evans, 1994). This locality is situated within the Elgol Coast Site of Special Scientific Interest.

## Description

The geological succession at the site has not been published. A general stratigraphical account of the Glen Scaladal succession has been given by Harris and Hudson (1980). The mammal remains occur in marlstone bands within the Kilmaluag Formation. The marls are generally dark blue-grey in colour (Waldman and Savage, 1972).

## Fauna

The Loch Scavaig site has yielded isolated tritylodont and mammal teeth, as well as a partial skeleton of a choristodere (an aquatic diapsid reptile), the lizard *Paramacellodus* and the stem-group lepidosauromorph *Marmoretta* (Waldman and Evans, 1994).

### REPTILIA

'Therapsida'

Tritylodontidae

*Stereognathus hebridicus* Waldman and Savage, 1972

### MAMMALIA

Docodonta

Docodontidae

*Borealestes serendipitus* Waldman and Savage, 1972

'pantothere' (Savage, 1984)

The tritylodont *Stereognathus hebridicus* is represented by 35 molar teeth, all isolated, and nothing else (Savage, 1984). The teeth ((Figure 2.14)a) are comparable with species of *Stereognathus* from English localities but differ in minor morphological details and size, hence warranting separation as a distinct, Scottish, species.

The mammal fauna has been reviewed by Savage (1984). The specimens of *Borealestes serendipitus* include a partial skeleton with upper and lower dentition, a fragment of maxilla with three teeth, four other mandibular fragments with teeth, and an isolated incisor tooth. The taxon was for a long time known only from this site, but Sigogneau-Russell

(2003a) has reported isolated teeth of the species from Kirtlington (see GCR site report, above) and from Watton Cliff. (see GCR site report, below). Docodont mammals were mouse-sized, with long narrow snouts and burrowing adaptations (Kron, 1979; Sigogneau-Russell, 2003a; Martin and Nowotny in Martin and Krebs, 2000). The 'pantothere' from Skye is represented by less complete material (Savage, 1984).

## Interpretation

The sedimentology of the Great Estuarine Group rocks has been studied extensively by a number of workers; consequently a detailed picture of the sedimentary environment of deposition has been pieced together. Hudson (1962, 1966) considered the Great Estuarine Group to have been deposited under conditions of variable, but generally low, salinity in a series of shallow lagoons. Holmden and Hudson (2003) have used strontium isotope studies to confirm that the Great Estuarine Group basin was lagoonal and controlled more by seasonal changes in evaporation, precipitation, and flooding than by direct inputs of seawater or riverine water transported over large distances. Lagoons containing the oyster *Praeexogyra* in the Duntulm Formation have a higher proportion of seawater than the *Praemytilus* lagoons of the Kildonnan Member. Uniform strontium/calcium ratios in many of the Great Estuarine Group molluscs is consistent with a seasonally dry, Mediterranean-style climate for Middle Jurassic times in Britain. Evidence for subaerial exposure, including desiccation cracks, has been recorded (Harris and Hudson, 1980).

Andrews (1985) divided the Kilmaluag Formation into two lithofacies. The first, the 'clastic facies', cropping out on north Skye, consists of calcareous mudstones and shales with minor sandstones and clayey limestones. These sediments are thought to represent deposition in shallow, ephemeral lagoons, mudflats and channels isolated from the sea. The invertebrate fauna indicates low salinity. The second lithofacies association, the 'argillaceous limestone facies', is composed of alternating beds of carbonates (some dolomitic) and calcareous shales. These sediments probably reflect a similar depositional environment to the 'clastic facies', with climatic fluctuations between humid and dry conditions. The overlying Skudiburgh Formation sees a change to dominantly alluvial sedimentation with some calcrete development. The upper part of the Great Estuarine Group represents a late Bathonian regression, with a change in palaeoenvironment from near-marine salinity lagoons (Duntulm Formation), through muddy lagoons with a low-salinity fauna (Kilmaluag Formation), to alluvial mudflats and channels (Skudiburgh Formation).

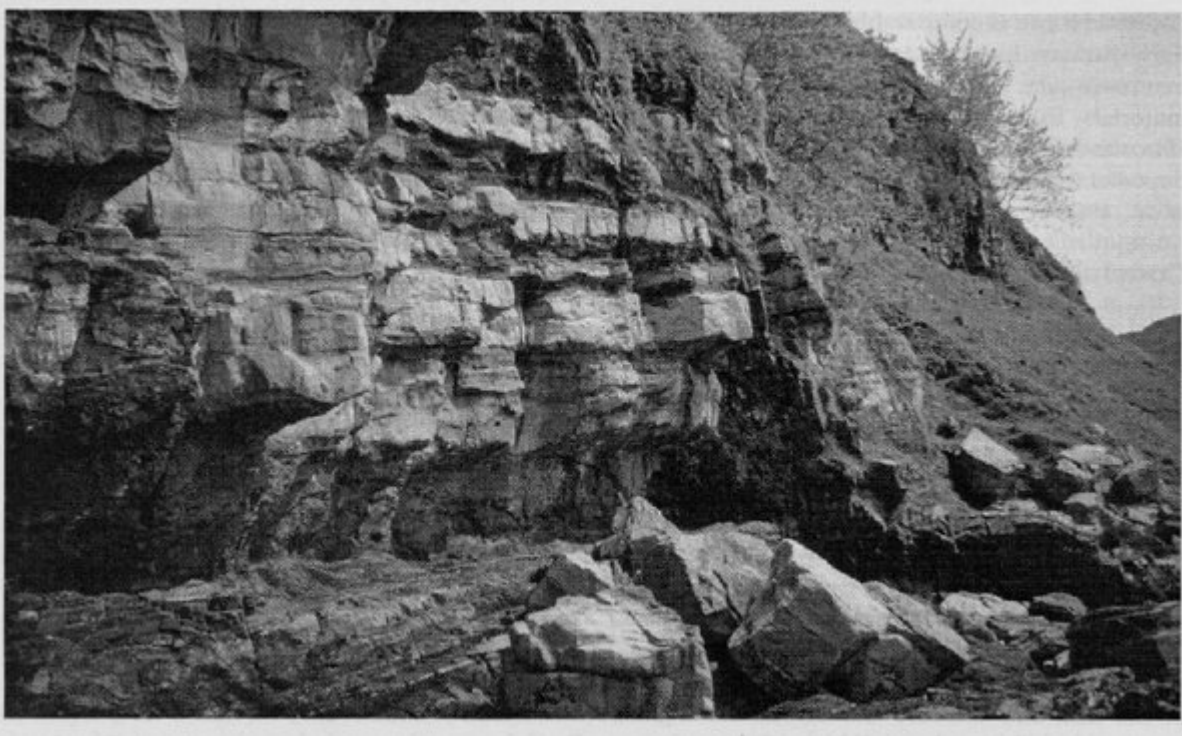
## Comparison with other localities

The Kilmaluag Formation of the Great Estuarine Group is of late Bathonian age. No direct correlation between the sedimentary sequence on Skye and deposits of a similar age in England is possible. However, the Kilmaluag Formation may be equivalent to the Forest Marble Formation or the Blisworth Clay of England (Andrews, 1985). If this is the case, then the site may be roughly equivalent in age to Kirtlington Old Cement Works (Waldman and Evans, 1994), a suggestion borne out by the recent (Sigogneau-Russell, 2003a) identification of teeth of *Borealestes serendipitus* there. The isolated finds of the tritylodont *Stereognathus* show similarities to the English faunas from Stonesfield Slate Mines and Kirtlington Old Cement Works. The basal lepidosauromorph *Marmoretta* provides a further link with the Kirtlington Old Cement Works site, which has yielded remains of the same taxon (Waldman and Evans, 1994). However, the lizard *Paramacellodus* has been reported hitherto mainly from the Late Jurassic deposits of North America, Portugal, Germany and England (Purbeck rocks of Durlston Bay), but paramacellodids are not known from Kirtlington Old Cement Works.

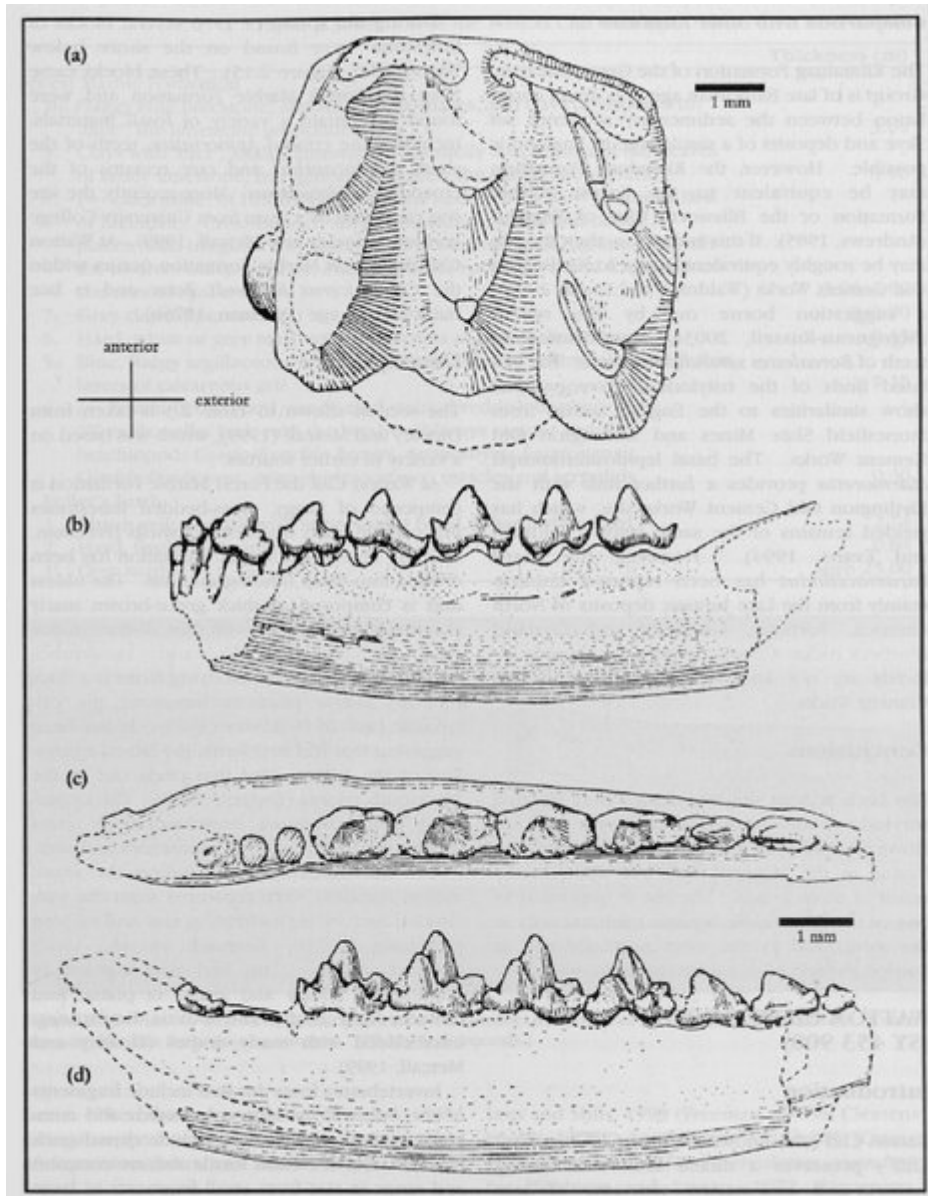
## Conclusions

The Loch Scavaig site has yielded only isolated tritylodont and mammalian fossils so far. However, exposure is good, and ongoing collecting in the Mammal Bed will undoubtedly result in more fossils. The site is important as one of the few Middle Jurassic mammal sites in the world and as the most northerly site in Europe to yield Mesozoic mammal fossils.

## [References](#)



(Figure 2.13) Loch Scavaig; Skye, general view of the successssion in the Kilmaluag (Mid Jurassic) Formation. (Photo: Colin MacFadyen.)



(Figure 2.14) Teeth and jaws from the Middle Jurassic sediments of Loch Scavaig, Skye. (a) Upper left molar tooth of the tritylodont *Stereognathus hebridicus* in crown view. (b-d) Left lower jaw of the docodont mammal *Borealestes serendipitus* in external, crown, and internal views. (After Waldman and Savage, 1972.)