
Lothbeg Point

[NC 962 096]

Potential GCR Site

Introduction

The section exposed at Lothbeg Point (Figure 5.6) has yielded an assemblage of well-preserved, but fragmentary plants including a new conifer, *Taxodiophyllum scoticum*. It occurs within marine deposits containing a rich marine fauna, which suggests that the plants drifted into this environment. The Lothbeg Point site makes an interesting comparison with the nearby flora at Culgower.

The site was first described in 1984 by van der Burgh and van Konijnenburg-van Cittert, some five years after the GCR site selection programme had been completed for the palaeobotany of the Scottish Jurassic Series. However, the flora encountered at this locality is clearly of considerable importance and merits inclusion in the GCR network that represents the Jurassic palaeobotany of Scotland.

Description

Stratigraphy

These Jurassic marine deposits are dark grey shales containing the remains of numerous cephalopods, bivalve molluscs and plant fragments. They are dated as early Kimmeridgian on the basis of the occurrence of the ammonite *Aulacostephanoides cf. mutabilis* J. Sowerby (Lam and Porter, 1977; van der Burgh and van Konijnenburg-van Cittert, 1984). The unusual depositional environment of these plant-bearing beds was shown by Neves and Selley (1975) to be a submarine delta involving turbidity flows, resulting in subwave-base marine muds (now shales) interbedded with boulder beds and sand flows.

Palaeobotany

Twenty-six plant taxa are known from Lothbeg Point (van der Burgh and van Konijnenburg-van Cittert, 1984); a complete list is given in (Table 5.1) (see also (Figure 5.7)). Although fragmentary, the plants are all well preserved. The ferns have very distinct veins and the gymnosperms good cuticles, which can be easily prepared for microscopic examination. The conifer species *Taxodiophyllum scoticum* was described from here on the basis of over 70 specimens of simple, flat, linear, single-veined leaves with characteristic epidermal features.

(Table 5.1) Floral composition of Lothbeg Point and Culgower Bay. The abundance of fossils is given as follows: +, 1–5 specimens; ++, 6–10 specimens; and +++, >10 specimens. Data from dispersed cuticles have been taken into account (from van Konijnenburg-van Cittert and van der Burgh, 1996).

	Lothbeg	Culgower
SPHENOPHYTA		
EQUISETALES		
<i>Equisetum</i> sp.	+	
PTERIDOPHYTA		
<i>Angiopteris boweri</i> (Seward) van Konijnenburg-van Cittert and van der Burgh	+	++
<i>Aspidistes thomasii</i> Harris	+	+
<i>Asplenium rigidum</i> Vassilevskaja		+

<i>Coniopteris setacea</i> Vakhrameev		+
<i>Gleichenia boodlei</i>		+
<i>G. cycadina</i> (Schenk) Seward	+++	+++
<i>Hausmannia buchii</i> (Andra) Seward	+++	+
<i>H. dichotomy</i> Dunker	++	++
<i>Matonidium goeppertii</i> (Ettingshausen) Schenk	++	+
<i>Phlebopteris dunkeri</i> (Schenk) Schenk	+	+++
<i>Sphenopteris onychyopsis</i> Seward		+
<i>Sphenopteris</i> sp.	+	+
<i>Selleyopteris morayensis</i> van Konijnenburg-van Cittert and van der Burgh		+
<i>Todites denticulatus</i> (Brongniart) Krasser	++	+
<i>T. williamsonii</i> (Brongniart) Seward	+	++
GYMNOSPERMOPHYTA		
CAYTONIAS		
<i>Sagenopteris phillipsii</i> (Brongniart) Presl	+	+++
PTERIDOSPERMS		
<i>Cycadopteris jurensis</i> (Kurr) Hirmer	+	
<i>Dichopterispomehi</i> (Saporta) Seward		+
<i>Pachypteris lanceolata</i> Brongniart	++	+++
CYCADALES		
<i>Nilssonia brevis</i> Brongniart		+
<i>N. orientalis</i> Heer	+	++
<i>Pseudoctenis eathiensis</i> (Richards) Seward	++	++
BENNETTITALES		
<i>Pterophyllum cycadites</i> Harris and Rest	+	++
<i>P. thomasii</i> Harris	+	+
<i>Pterophyllum/Otozamites</i>		+
<i>Williamsonia</i> sp.		+
<i>Zamites buchianus</i> (Ettingshausen) Seward		+
GINKGOALES		
<i>Baiera</i> cf. <i>muensteris</i> (Presl in Sternberg) Saporta		+
<i>Ginkgo</i> sp.	+	
<i>Sphenobaiera longifolia</i> (Pomel) Florin		+
CZEKANOWSKIALES		
<i>Czekanowskia rigida</i> Heer	+++	+
<i>Phoenicopsis gunnii</i> Seward	++	+
PINALES		
<i>Araucarites milleri</i> Carruthers		+
<i>Brachyphyllum eathiensis</i> Seward		++
<i>Elatides curvifolia</i> (Dunker) Nathorst (with attached male and female cones)	+	+++
<i>Elatocladus jeffiyi</i> (Seward) van Konijnenburg-van Cittert and van der Burgh		+
<i>Masculostrobis zeilleri</i> (Seward)		+

<i>Podozamites</i> sp.		++
<i>Tritaenia scotica</i> van der Burgh and van Konijnenburg- van Cittert	+++	+++

Interpretation

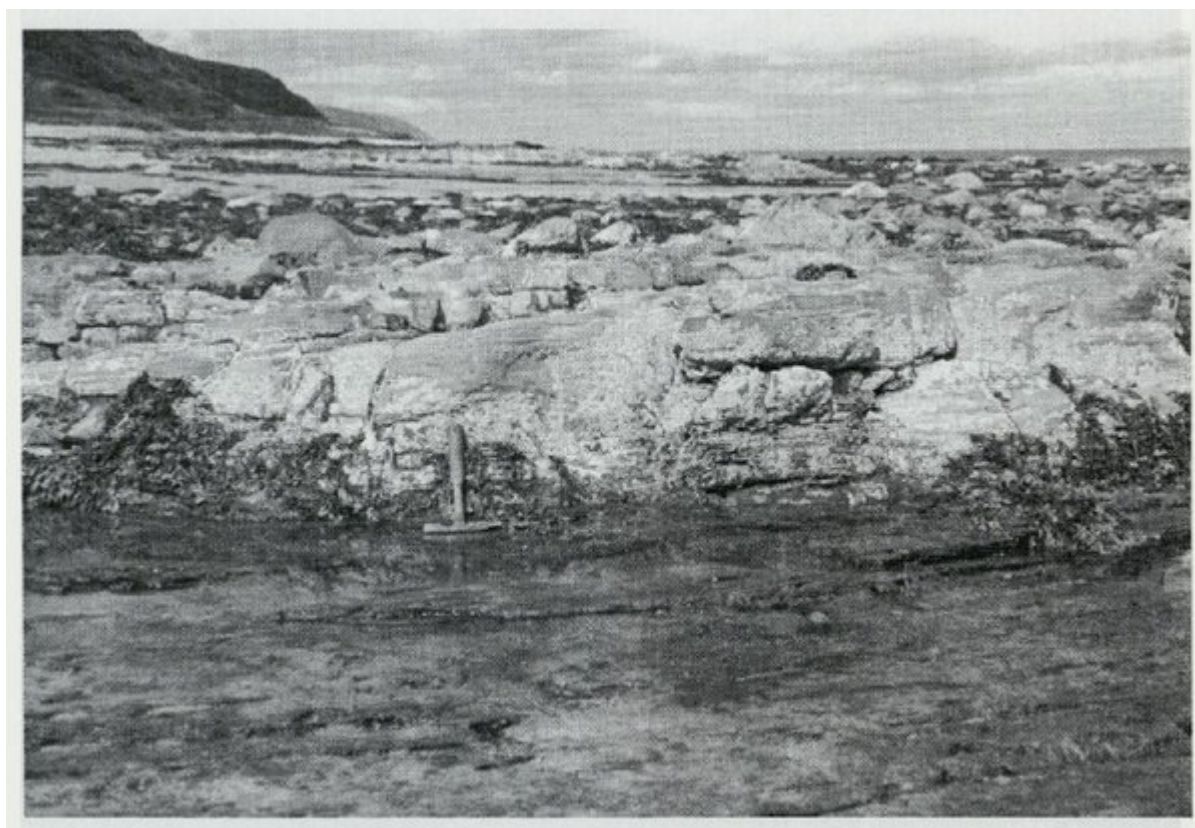
Of the 26 taxa at Lothbeg Point, eight also occur in the plant beds of the Yorkshire Jurassic succession and a further four have near relatives there. Six of the 26 also occur in Lower Cretaceous, Wealden, deposits of south-east England and another five have near relatives there.

The fossils must have been transported by rivers that shed their load into the sea. Van der Burgh and van Konijnenburg-van Cittert have analysed the flora according to the methodology described by van der Burgh (1993). Their table shows high numbers for brackish and freshwater swamps, medium figures for moist lush vegetation and heath, and low figures for upland forest. The comparatively high figure for heathland is certainly attributable to the good preservation and easy recognition of the fusainized leaf fragments of the fern *Phlebopteris dunkeri*.

Conclusions

The Lothbeg Point section yields an unusual assemblage of well-preserved fragments of plants in marine shales that also contains a rich fauna. It is an important site for comparison with the nearby exposure at Culgow.

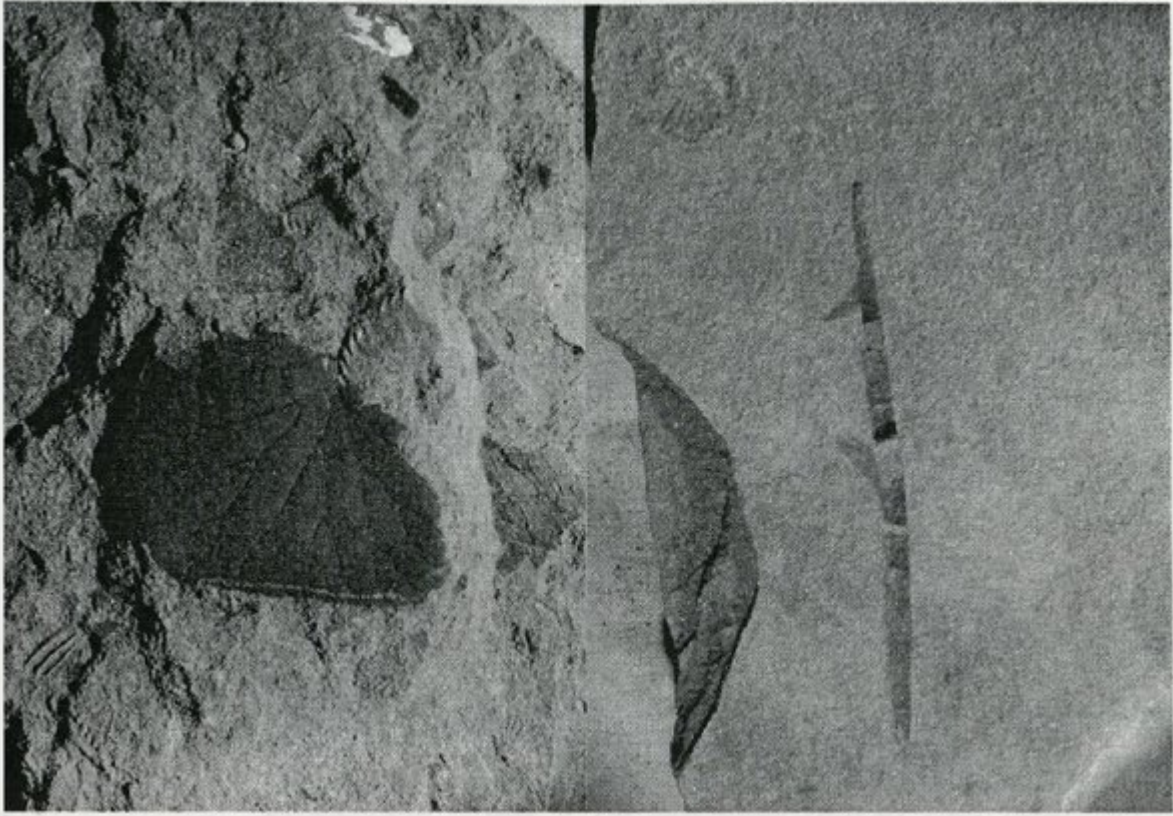
References



(Figure 5.6) Plant beds exposed on the foreshore of Lothbeg Point (Photo: J.H.A. van Konijnenburg-van Cittert.)

	Lothbeg	Culgower
SPHENOPHYTA		
EQUISETALES		
<i>Equisetum</i> sp.	+	
PTERIDOPHYTA		
<i>Angiopteris boweri</i> (Seward) van Konijnenburg-van Cittert and van der Burgh	+	++
<i>Aspidites thomasi</i> Harris	+	+
<i>Asplenium rigidum</i> Vassiljevskaja		+
<i>Coniopteris setacea</i> Vakhrameev		+
<i>Gleichenia boodlei</i>		+
<i>G. cycadina</i> (Schenk) Seward	+++	+++
<i>Hausmannia buchii</i> (Andr�) Seward	+++	+
<i>H. dichotoma</i> Dunker	++	++
<i>Matonidium goeppertii</i> (Ettingshausen) Schenk	++	+
<i>Phlebopteris dunkeri</i> (Schenk) Schenk	+	+++
<i>Spbenopteris onchyopsis</i> Seward		+
<i>Spbenopteris</i> sp.	+	+
<i>Selleyopteris morayensis</i> van Konijnenburg-van Cittert and van der Burgh		+
<i>Todites denticulatus</i> (Brongniart) Krasser	++	+
<i>T. williamsonii</i> (Brongniart) Seward	+	++
GYMNOSPERMOPHYTA		
CAYTONIAS		
<i>Sagenopteris phillipsii</i> (Brongniart) Presl	+	+++
PTERIDOSPERMS		
<i>Cycadopteris jurensis</i> (Kurr) H�rmer	+	
<i>Dichopteris pomelii</i> (Saporta) Seward		+
<i>Pachypteris lanceolata</i> Brongniart	++	+++
CYCADALES		
<i>Nilssonia brevis</i> Brongniart		+
<i>N. orientalis</i> Heer	+	++
<i>Pseudocatenis eatbiensis</i> (Richards) Seward	++	++
BENNETTITALES		
<i>Pterophyllum cycadites</i> Harris and Rest	+	++
<i>P. thomasi</i> Harris	+	+
<i>Pterophyllum/Otozamites</i>		+
<i>Williamsonia</i> sp.		+
<i>Zamites buchianus</i> (Ettingshausen) Seward		+
GINKGOALES		
<i>Baiera cf. muensteris</i> (Presl in Sternberg) Saporta		+
<i>Ginkgo</i> sp.	+	
<i>Spbenobaiera longifolia</i> (Pomel) Florin		+
CZEKANOWSKIALES		
<i>Czekanowskia rigida</i> Heer	+++	+
<i>Pboenicopsis gummii</i> Seward	++	+
PINALES		
<i>Araucarites milleri</i> Carruthers		+
<i>Brachyphyllum eatbiensis</i> Seward		++
<i>Elatides curvifolia</i> (Dunker) Nathorst (with attached male and female cones)	+	+++
<i>Elatocladus jeffryi</i> (Seward) van Konijnenburg-van Cittert and van der Burgh		+
<i>Masculostrobos zeileri</i> (Seward)		+
<i>Podozamites</i> sp.		++
<i>Tritaenia scotica</i> van der Burgh and van Konijnenburg-van Cittert	+++	+++

(Table 5.1) Floral composition of Lothbeg Point and Culgower Bay. The abundance of fossils is given as follows: +, 1–5 specimens; ++, 6–10 specimens; and +++, >10 specimens. Data from dispersed cuticles have been taken into account (from van Konijnenburg-van Cittert and van der Burgh, 1996).



(Figure 5.7) Representative plant fossils from the Kimmeridgian of Lothbeg Point. Left, *Hausmannia buchii* (Andra) Seward (fern). Right, *Triaenia scotica* van der Burgh and van Konijnenburgh-van Cittert (conifer). Both about natural size. (Photos J.H.A. van Konijnenburg-van Cittert.)