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		
Angiopteris boweri (Seward) van		
Konijnenburg-van Cittert and van der	+	++
Burgh		
Aspidistes thomasii Harris	+	+
Asplenium rigidum Vassilevskaja		+

Coniopteris setacea Vakhrameev Gleichenia boodlei		+ +
G. cycadina (Schenk) Seward	+++	+++
Hausmannia buchii (Andra) Seward	+++	+
H. dichotomy Dunker	++	++
Matonidium goeppertii (Ettingshausen)		
Schenk	++	+
Phlebopteris dunkeri (Schenk) Schenk	+	+++
Sphenopteris onychyopsis Seward		+
Sphenopteris sp.	+	+
Sellevopteris moravensis van		
Koniinenburg-van Cittert and van der		+
Burgh		
Todites denticulatus (Brongniart)		
Krasser	++	+
T williamsonii (Brongniart) Seward	+	++
GYMNOSPERMOPHYTA		
Sagenonteris phillinsii (Brongniart) Pres	1+	++ +
PTERIDOSPERMS		
Cycadopteris jurensis (Kurr) Hirmer	+	
Dichopterispomehi (Saporta) Seward		+
Pachypteris lanceolata Brongniart	++	+++
CYCADALES		
Nilssonia brevis Brongniart		+
N. orientalis Heer	+	++
Pseudoctenis eathiensis (Richards)		
Seward	++	++
BENNETTITALES		
Pterophyllum cycadites Harris and Rest	+	++
<i>P. thomasii</i> Harris	+	+
Pterophyllum/Otozamites		+
Williamsonia sp.		+
Zamites buchianus (Ettingshausen)		
Seward		+
GINKGOALES		
Baiera cf. muensteris (Presl in		
Sternberg) Saporta		+
Ginkao sp.	+	
Sphenobaiera longifolia (Pomel) Florin		+
CZEKANOWSKLALES		
Czekanowskia rigida Heer	+++	+
Phoeniconsis aunnii Seward	++	+
PINALES		•
Araucarites milleri Carruthers		_
Brachynhyllum eathiensis Seward		
Elatides curvifolia (Dunker) Nathorst	+	
(with attached male and female cones)	т	
Elatocladus ioffini (Soward) von		•
Koniinonburg von Cittort and von der		
Rurah		т
Massulastropus zeilleri (Sewerd)		
wasculositobus zellieri (Sewaru)		т

++

+++

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 Culgower.

References



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

	Lothbeg	Culgower
PHENOPHYTA		
EQUISETALES		
Equisetum sp. PTERIDOPHYTA	+	
Angiopteris boweri (Seward) van Konijnenburg-van	+	++
Actualities thomasii Harris	+	+
Artilenium einidum Vasilevakaia		+
Conjohleris setaced Vakhramen		+
Gleichenia hoodlei		+
C carading (School) Semmed	+++	+++
Haumannia huchil (Andri) Semand	+++	
H dichotoma Dunker	+++	++
Matonidium methertii (Ettingshausen) Schenk	++	+
Phlehotteris durberi (Schenk) Schenk	+	+++
Sthenotterie on chuster (Schenk) Schenk		+
Sphenisterie sp	+	1
Selleyopteris morayensis van Konijnenburg-van Cittert		+
Todites denticulatus (Brononiart) Krasser	++	+
T. williamsonii (Brongniart) Seward	+	++
YMNOSPERMOPHYTA CANTONIAS	Section Section	Second State
Carmonianis bhillibeil (Benneniani) Bead		
PTERIDOSPERMS	Ť	
Cycadopteris jurensis (Kurr) Hirmer	+	
Dicbopteris pomelii (Saporta) Seward		+
Pachypteris lanceolata Brongniart CYCADALES	++	+++
Nilssonia brevis Brongniart		+
N. orientalis Hoor	+	++
Pseudoctenis eatbiensis (Richards) Seward	++	++
BENNETTITALES		
Pterophyllum cycadites Harris and Rest	+	++
P. thomasii Harris	+	+
Pterophyllum/Otozamites		+
Williamsonia sp.		+
Zamites buchianus (Ettingshausen) Seward GINKGOALES		+
Baiera cf. muensteris (Presl in Stemberg) Saporta		+
Ginkeo sp.	+	
Sthenobaiera longifolia (Pomel) Florin		+
CZEKANOWSKIALES		
Czekanowskia rigida Heer	+++	+
Phoenicobsis gunnii Seward	++	+
PINALES	Color States	
Araucarites milleri Carruthers		+
Brachyphyllum eathiensis Seward		++
Elatides curvifolia (Dunker) Nathorst	+	+++
(with attached male and female cones)		+
Elatocladus ieffryi (Seward) yan Konjinenhure yan		+
Cittert and van der Burgh		
Masculostrobus zeilleri (Seward)		+
Podoramites sp		++
Tritaenia scotica van der Burgh and van Konlinenburg.	+++	+++
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) Representstive plant fossils from the Kimmeridgian of Lothbeg Point. Left, Hausmannia buchii (Andra) Seward (fern). Right, Tritaenia scotica van der Burgh and van Konijnenburgh-van Cittert (conifer). Both about natural size. (Photos J.H.A. van Konijnenburg-van Cittert.)