

THE HOLKERIAN/ASBIAN BOUNDARY (VISÉAN) AT THE LITTLE ASBY SCAR STRATOTYPE SECTION (CUMBRIA, ENGLAND): NEW EVIDENCES ON ITS CORAL FAUNA, FACIES, AND BIOSTRATIGRAPHIC ZONATION

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The division of the British Lower Carboniferous succession into substages is today widely accepted and used as a reference in other countries. However, despite their wide acceptance the exact correlations of the boundary intervals within Britain and with adjacent countries are often problematic.

New investigations at the stratotype section of the Holkerian/Asbian boundary at Little Asby Scar in Cumbria illustrate some of the problems linked to this boundary. The distribution patterns of rugose corals and microfossils, and the application of sedimentary sequences have led to a new interpretation of the boundary interval and to the first detailed correlation to age-equivalent succession in Belgium.

Five coral assemblages from the Holkerian-Asbian succession of the stratotype section at Little Asby Scar have been studied. It is clear that the stratotype section is located near a fault zone, and that the contact of the Potts Beck Limestone (earlier Asbian) and the Knipe Scar Limestones (later Asbian) is tectonically controlled.

The limestone bed which has previously been considered to represent the base of the Asbian (bed f) bears a coral assemblage which is clearly Holkerian in age. The first *Dibunophyllum*, the traditional coral genus for the Asbian-Brigantian (later Viséan), is not known until the overlying Knipe Scar Limestone. However, other coral taxa from the Knipe Scar Limestone are typical of the late Asbian. No coral assemblages of the earlier Asbian were found.

The coral bed at the base of the Potts Beck Limestone (bed f) is classified as polyspecific parabiostrome. Macrofaunal distribution patterns show vertical and horizontal shifts over its total exposed length (800 m). The main components of the biostrome are fragmented colonial rugose corals, mostly *Siphonodendron* (?due to storm events). Other locally important components are chaetetids, solitary rugose corals and tabulate corals.

A detailed comparison of the coral assemblages and foraminiferans at Little Asby Scar with standardized Belgian biozones and sedimentary sequences allows a revised correlation of this succession. The Ashfell Limestone, plus the basal unit (bed f) of the Potts Beck Limestone, is correlated to the Belgian Seilles Member, indicating that the Belgian Livian/Warnantian boundary occurs within this interval. It belongs to the highstand system tract of sequence 7. The earlier Asbian (beds g-i of the Potts Beck Limestone) forms the thin sequence 8. The Knipe Scar Limestone comprises sequence 9, and its coral distribution allows differentiation into the biozones RC7 α/β . The Holkerian/Asbian boundary should be shifted to the boundary between beds f and g of the Potts Beck Limestone.