unstable graptolite bloom became more ordered and predictable as nutrient concentrations waned. This series of observations has its modern counterparts - it closely matches those from high nutrient, low chlorophyll (HNLC) zones in the Southern Ocean following the eruption of Mt. Pinatubo in 1991 and from the IronEx experiments carried out in the Pacific. The natural experiment recorded in the Silurian rocks of the Southern Uplands of Scotland shows that iron was a limiting factor in plankton productivity at this time and demonstrates a fundamental similarity of control on plankton distribution between the modern and Palaeozoic oceans.

THE NORTHERN BELT ONE HUNDRED YEARS ON: A REVISED MODEL OF THE ARENIG-CARADOC TRACTS NEAR LEADHILLS

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Since Peach and Horne (1899) wrote their memoir on the Silurian rocks of Britain (Volume I Scotland) much has been added to our knowledge of the Northern Belt. Several models of the evolution of the belt have been put forward; ranging from geosynclines, accretionary prisms, back-arc basins to within-plate rifts. The purpose of this presentation is to assemble the salient geological data for part of the Northern Belt rocks and propose the most likely sedimentary, provenances and structural setting for these rocks from Arenig to Ashgill times. Building on the work of Floyd (1982), Armstrong et al. (1996), etc., the distinct tracts separated by near strike parallel faults within the Northern Belt have been established. The link between the Tappins Group rocks within the Northern Belt and that north of the Southern Upland Fault provides a link with the Midland Valley terrane. Recent work has emphasised the apparent gap between the Arenig and earliest Caradoc faunal assemblages found in similar chert and mudstone facies; it is debatable whether or not this is a significant break.

This study is based on BGS work in the central part of the Northern Belt where several of the component formations have their type areas. The geochemistry of the rocks in the Northern Belt show the variation of sediment sources between and even within the tracts. Local volcanic outpourings within the tracts have within-plate settings and the interdigitation of volcaniclastic detritus with the clastic detritus sourced outwith the basin is described specifically within the Marchburn and Kirkcolm formations. The Blackcraig and Galdenoch formations are probably channel deposits within the Kirkcolm Formation; likewise the Glenwhargen Formation forms channels in the Portpatrick Formation and the Shinnel Formation contains conglomeratic lenses. The provenance of the rudaceous clasts in the Blackcraig Formation (and the Corsewall Formation) is indicated by material from at least 5 main sources: 1 - a dacitic to rhyolitic volcanic to high level intrusive source; 2 – a high-grade possibly amphibolite facies, metamorphic terrane composed of quartzose metasedimentary and metabasic rocks, including mylonitic rocks; 3 – a plutonic granitic source composed of granite, granodiorite, diorite and leucotonalite; 4 - an andesitic to dacitic volcanic source; and 5 – a sedimentary source interpreted as penecontemporaneous rip-ups of the turbidite sequence. The sedimentology of the rocks indicates a varied and unstable setting for much of the deposition and the provenance of the clastic detritus is interpreted to be mainly from a complex continental/arc terrane composed of relatively high-grade metamorphic rocks deformed by major ductile shear zones and intruded by several, possibly major, granitic intrusive suites. In addition a minor proportion of the volcanic detritus comes from local within-basin centres such as the Bail Hill Volcanic Group. New structural data on the tract boundaries, in particular the Leadhills and Fardingmullach imbricate zone are given.