
Careg-Onen RIGS site

Site [SH 581 819]

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RIGS Statement of Interest:

The Careg-Onen site on the east side of Red Wharf Bay, reveals the unconformity between Precambrian Mona Complex and Lower Cambrian beds.

The Careg-Onen site is one of three network sites. One is the Careg Onnen site on the east side of Red Wharf Bay, a second is in the central, south-west part of Anglesey at Trefdraeth, and a third near Beaumaris above the Menai Strait. Together these sites reveal the nature of the sequence from the Precambrian Mona Complex across an unconformity into beds which are thought to be of Lower Cambrian age. The unconformity is a widespread feature which is thought to be the basal Dyfed unconformity. At the Careg-onen site, sheets of Mona Complex schist are interlayered with Careg-onen mudstones. The unconformity between the two stratigraphic units is inferred from the contrast in deformation between the widely spaced fissility of the sandy-mudstones of the the Careg Onen Beds and the more deformed schists of the Mona Complex. The Mona Complex deformation is generally regarded as Precambrian in age whilst the sediments post-dating the Mona-Complex deformation are likely to be Cambrian or possibly Ordovician in age: in either case the Careg-onen Beds are likely to lie above the early Cambrian unconformity, and be further evidence of the wide distribution of this unconformity. Evidence for the unconformity was recorded in the cliffs around Careg-onen Cove by Greenly (1919) where there were folds in the Mona Complex truncated by a thrust and unconformably overlain by the Careg-onen Beds. The critical parts of the Careg-onen Cove are now inaccessible and other parts of the cliffs are obscured. Access to the cove would probably add considerably to the interest of the site.

Geological setting/context: The basement of Eastern Avalonia that underlies most of Anglesey, the Welsh Basin and the Midland Platform was formed as a result of the amalgamation of volcanic regions near the margin of Gondwanaland near the Equator. As the terrane migrated towards Laurentia during the Palaeozoic it suffered varied tectonic deformation, particularly extension and strike-slip faulting of component terranes. The Welsh Basin was created and evolved during the Cambrian as an extensional basin. The basal Cambrian transgression over basement rocks reflects either regional subsidence or a eustatic rise of sea-level that not only affected the Welsh Basin, but also the Irish-Sea Platform in Anglesey and the Midland Platform in England. The unconformity is identified as marking the base of the Dyfed Supergroup, the oldest of three supergroups deposited during the Palaeozoic.

Network context of the site: The division of the Lower Palaeozoic succession into three 'megasequences' namely the Dyfed, Gwynedd and Powys supergroups, was made in the rocks of the Welsh Basin. Every lithostratigraphical RIGS has been selected to demonstrate a particular key aspect of the evolution of Welsh Basin and the geological interest at each site can be examined within the framework of the megasequence model outlined above. In this respect, individual RIGS can be related to a regional event and/or process occurring within the Welsh Basin, for example a change in style of sedimentation, or the onset of regional tectonic or volcanic activity. As well as causing lithological variations, the regional events and processes occurring within the basin may be reflected locally by the presence of certain types of sedimentary structures and by variations in fauna. The latter, also provides important biostratigraphical markers within the basin fill, as well as critical age constraints on the timing of certain events. The importance of the Careg-Onen site is that Careg-Onen muddy sandstones are substantially less deformed than adjacent the schists of the Mona Complex and according to the now inaccessible observations of Greenly (1919) appear to lie unconformably across layering in the Mona Complex (Neoproterozoic), indicating that the Careg-Onen rocks are younger than Neoproterozoic and are likely to be Cambrian sediments deposited during the basal Dyfed transgression. It therefore appears likely that the basal transgression of the Dyfed Supergroup extends beyond the margins of the Welsh Basin on to the Irish Sea Platform on Anglesey. The RIGS of stratigraphical interest in Gwynedd are assigned to one or more of the following networks:

1. Stratigraphic interval (period, series, stage etc.)
2. Lithostratigraphical importance (stratotypes, type sections, reference sections etc.)
3. Sedimentological and palaeoenvironmental significance.
4. Biostratigraphical importance (e.g. key fossil localities, biozones, type localities).
5. Sedimentary structures (to include pre-lithification structures, for example slump folds, sole structures, and unconformities). There is a degree of overlap between this group and Network 3 of the Structural Geology RIGS.
6. The Careg-onen,site belongs to networks 1 and 3 , because it probably records the lower partof the Dyfed Supergroup and provides evidence of the the basal Cambrian transgression.

References:

GREENLY, E.1919. The Geology of Anglesey. Memoir of the Geological Survey of Great Britain,78, 1–980.

WOODCOCK, N.H. 1990. Sequence stratigraphy of the Palaeozoic Welsh Basin,Journal of the Geological Society, London. 147, 537–547