
Chapter 3 Introduction to the Mona Complex

Its metamorphic rocks have long been the prime interest in the geology of Anglesey, their age and their nature having been the subject of keen discussion for half a century. Not only are they by far the most important formation in the Island, occupying something like two-thirds of its area, but having an outcrop of nearly 200 square miles they are much the largest metamorphic tract of southern Britain. Their diversity of composition is also very great, more than 70 petrological types, containing 66 rock-forming minerals, being now known among them, and the structure is involved in the extreme.

Emerging on the cores of denuded Ordovician anticlines, they appear at the surface in 38 separate tracts, five of which may be called their main regions, and the other 33 their inliers. These will be referred to as follows:

The Aethwy Region in the south-east, between Llanddona and Llanddwyn (from Aethwy, 'The Narrow Waters', an old name for the Menai Strait), bounded by a great Post-Carboniferous rupture that will be called the Berw fault.

The Middle Region, between Malldraeth Bay and Mynydd Bodafon.

Holy Isle.

The Western Region, about Llanfachraeth and Llanfaethlu.

The Northern Region, bounded by a master line that will be called the Carmel Head Thrust-plane, which runs from Carmel Head to near Point Lynas.

The inliers are:

The Two Pentraeth Inliers.

The Deri Inlier, north of Mynydd Bodafon.

The Nebo Inlier, west of Ynys Dulas.

The Corwas Inlier, between Pensarn and the Carmel Head Thrust-plane, against which it abuts near Llyn Llaethdy.

The Garn Inlier, at Mynydd y Garn.

The Fydlyn Inlier, at and inland of Ynys y Fydlyn.

The Gader Inlier, at Pen-bryn-yr-eglwys, which is always known locally as 'The Gader'.

The remaining small ones being one west of Mynachdy, eleven in the neighbourhood of Llanerchymedd, five near Bryngwran, two at Nebo, Graig-fryn and four others at Bodafon, and one at Rhyd-y-saint, Pentraeth.

The surface is often extremely rugged, though seldom lofty, rising, however, to 720 feet at Holyhead Mountain, and over 500 feet at four other hills; and there are long lines of coast, so that the rocks are freely exposed.

Owing to the great variety both of material and condition, a brief general picture is not easy to convey. Sedimentary are more extensive than igneous rocks. The most widespread types are pale green schists after sediments in which there is a marked tendency to rapid psammitic and pelitic alternation; but there are thick beds of quartzite and limestone, and thin ones of carbonaceous phyllite, as well as jaspers. Large quantities of volcanic material, basic and acid, pyroclastic and effusive, lie among the sediments, and there are plutonic intrusions that range from acid granites to dunite serpentines. A deep-seated gneissic suite is also present. A unique feature is the development of glaucophane-schist on a large scale. With regard to condition, foliation is completely absent at a few places, but this is rare and local, almost all the rocks being schistose and re-crystallised. Over large parts of the Island the grade of metamorphism is not high, but there are also large tracts (apart from the gneisses) of true lustrous crystalline schists. Yet, even in these, the original characters

are seldom obliterated for long together, except in what has been called the Penmynydd Zone of metamorphism, where both basic and acid rocks are holocrystalline schists for miles. In the Penmynydd the crystalline grade is of the highest. Rapid folding can be seen almost everywhere, while other parts have been internally ruptured on a great scale, producing extensive tracts of Autoclastic Mélange.

The whole falls into the following sub-divisions:

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| | 9. The Penmynydd Zone Of Metamorphism (Correlated with Groups 2 and 3) | mica-schist, hornblende-schist, and glaucophane-schist |
| | 8. The Plutonic Intrusions | Granite, diorite, gabbro, serpentine, &c. |
| | 7. Holyhead Quartzite | Quartzite |
| | 6. South Stack Series | Grits and mica-schists |
| | 5. New Harbour Group | Grit, mica-schist, jasper, spilitic lava |
| | 4. Skerries Group | Conglomerate, grit, and tuff |
| The Bedded Succession | 3. Gwna Group | Grit, phyllite, quartzite, limestone, w jasper, graphitic phyllite, spilitic lava, albite-diabase |
| | 2. Fydlyn Group | Felsitic lavas and tuffs |
| | 1. The Gneisses | Basic and acid gneiss |

Group 9 is not a stratigraphical but a metamorphic zone. Groups 3, 4, 5, 6 develop different depositional facies in different parts of the Island. 'Penmynydd', 'Gwna', 'Fydlyn', should be pronounced as 'Pemúnnyth', 'Gooná', 'Vudlyn' (the 'th' being as in 'thou').

In what follows, there will often be occasion to allude to these rocks, considered as a geological unit; so some concise and euphonious name is needed for them. To calling them 'The Schists' or 'Schistose Series' there is the objection that they are by no means always schistose. They have been called 'Archæan', but no trace of a 'Beginning' has been found in them. In Chapter 9 it will be shown that some at any rate are Pre-Cambrian, and strong evidence is brought forward for regarding the whole of them as such. But as the Cambrian base in North Wales has not yet been zonally defined; and lest, therefore, some Cambrian rocks may have been included (a thesis, however, which will now need to be supported by very cogent evidence, and seems highly improbable), it has been thought better to postpone the use of the term 'Pre-Cambrian' as a formational name. Correlation with Uriconian, Pebidian, and other ancient rocks is not yet possible. The very convenient word 'Monian' was explicitly intended by its author to imply a Pre-Cambrian age; and also that the rocks form a single system, which does not seem to be the case, even if all be Pre-Cambrian. After consultation with Drs. Horne, Strahan, and Teall, and also with the veteran worker on the stratigraphy of these rocks, Dr. Callaway, as well as with Prof. Bonney and Dr. Matley, it has been decided to adopt the term (suggested by Dr. Strahan) of 'The Mona Complex', or, briefly, 'The Complex'.

Though liable to the disadvantage that it cannot be used adjectivally, it seems free from scientific objections, implying only that the rocks are tectonically woven together by secondary structures, and therefore behave as a unit in relation to the other rocks of the Island. It is not thought that any rocks of Ordovician age can have been included (save, possibly, some small strips on the margins of the Fydlyn Inlier, where later shearing made separation difficult). The Mona Complex may therefore be defined; first, in negative terms, as including all the Pre-Silurian rocks of the Island (other than the Baron Hill and Careg-onen rocks) which have been separated from the Ordovician; and secondly, in positive terms, as consisting of the nine groups enumerated on page 38. - Evidence will, however, be presently adduced in favour of its possessing much more internal coherence than is implied in either of these definitions. The term is adopted as a temporary expedient, until the time comes (perhaps not very far distant) when these rocks can be correlated with the other ancient rocks of Britain, and placed on definite stratigraphical horizons.