The geology of Anglesey. Part 1 — preliminary

Chapter 1 Introduction

Or northward unto cloud-roofed Gwynedd, where

The mountains sit together and talk with heaven,

While Mona, pushing forth into the deep,

Looks back for ever on their musing brows'.

William Watson.

The Island of Anglesey, parted from the mainland only by the long narrow trench of the Menai Strait, though lying on the western sea-board of Great Britain, is nearly central among the British Islands considered as a whole, and its geological formations are therefore nearly in the midst of those that appear upon the British marine platform. From every part of the Island the long front of mountain in which the great Welsh Highland ends off abruptly is a conspicuous feature, forming the whole southeastern horizon; from its northern coasts the Isle of Man is often to be seen; and from its western headlands even the mountains of the east of Ireland are sometimes visible in clear weather. Most travellers, perhaps, obtain their first view of its curious even skyline and of its gently undulating and somewhat low but strangely rugged surface, from the track of the Irish mail between Peninaen-mawr and Holyhead. Only from the summits of the Mountain-land, however, which command a view of almost the whole of the Irish Sea, can the Island be taken in at a single glance. Let the reader suppose that he is seated on the summit of Snowdon or some adjacent mountain, 3,000 or more feet above the sea. Looking thence to the north-west, the line of the trench-like strait can be made out, beyond which a great tract of lowland extends outward into the sea for rather more than twenty miles. This is the Island of Anglesey. The peculiar form that it has upon a map is quite recognisable, but greatly foreshortened, for the angle subtended by its northern parts is only about 1° 30■. Seen from this height, it looks so flat and low as to appear hardly more than a shoaling of the sea, with here and there a rounded eminence.

Yet on a nearer approach, this low-seeming land is found to be anything but a true lowland. Seen from near Garth Ferry, it rises very steeply from the water to a height of some 300 feet, and the long, straight, even sky-line that it presents to a traveller on the railway between Llanfairfechan and the Bridges hardly falls below that level for several miles. Entering upon Anglesey itself,. the main line of railway, the main Holyhead' road, or indeed any traverse north-westward, will take one across a succession of broad, flat-topped ridges, and broad, straight valleys, all trending northeast and south-west, parallel with the Menai Strait. Along the watershed, which keeps about two miles from the eastern coast (and is repeatedly trenched by the dominant troughs), the ridges are about 300 feet in height, whence they fall off gently to about 200 feet along the western coast, where the valleys also broaden into wider tracts of lowland. Overlooking the whole are nine isolated hills, all about 500 feet in height, with the exception of Holyhead Mountain, which reaches 720 feet, and is the highest point in the Island. Most of the surface is under cultivation, chiefly for pastoral purposes, and has been so for centuries—it was known indeed in the Middle Ages, as 'Mon Mam Cymru', Mona the Mother of Wales', because its crops fed the adjacent mainland. But there are many tracts of wild moorland, the higher hills are bare and rugged, large parts even of the lower country are hardly less so, and rounded bosses of rock rise almost everywhere through the smooth surface of even the cultivated lands.

The total area is 290½ square miles. The principal diameters are: Puffin Island to the South Stack at Holyhead, 28 miles; Red Wharf Bay to Malldraeth Bay, 10; Aber Menai Point to Dinas Cynf or (south to north), 21; Menai Suspension Bridge to the Skerries (south-east to north-west), 23; Puffin Island to Llanddwyn (north-east to south-west), 21 miles; and the length of the coastline, about 150 miles. The climate is of the type usual on the western coasts of Britain, but the rainfall is vastly less than that of the adjacent mountain-land, which may often be seen to be wrapped in cloud for hours after sunshine has broken out on Anglesey. Its average annual rainfall is about 37.00 inches, which may be compared with

Bristol 28.5, London 221, Clacton-on-Sea 16.66, Snowdon (a high corrie) 196.16. There is but little woodland (though much more is described in ancient records), and what there is bears visible marks of the sea-winds by which the Island is swept from three directions, as well as of the prevalence and power of the westerly gales, for even on the eastern side the trees are clipped' and driven over from the west.

The population, which is chiefly agricultural, was 50,928 at the last census. The old county town is Beaumaris, with its great mediaeval castle. The agricultural centre is Llangefni: Amlwch was the creation of the Parys Mountain mines; Holyhead, the largest town, is (and, according to information kindly supplied by Mr. Edward Watson of the City of Dublin Steam Packet Company, has been since the reign of Queen Elizabeth) the chief port for the Irish mails. The people are for the most part bilingual, with a considerable monoglot percentage. The place-names are chiefly Welsh, and it may be as well to say that, throughout this book, they will be spelt as on the Ordnance Survey maps, for the sake of precise and easy identification, whether that spelling be linguistically correct or not. The names, moreover, will be those found on the published one-inch Geological Map, except in a small number of special cases (indicated in the text) where names have been added that will only be found on the six-inch and .0004 (1: 2500) maps.

For the Island itself, the spelling 'Anglesey', which is used upon the maps and therefore adopted in this volume, is regarded by etymologists as correct. The first appearance of the term is early in the ninth century. According to the best authorities it is derived from Old Norse 'Ev', an island, and 'Önguls', a strait or 'narrow', an interesting reference to that physical feature which would naturally be the one most likely to impress itself on the minds of the Viking rovers. The Celtic designation, 'Môn', is far older. It appears in the oldest written references to the Island, those of Ptolemy and Tacitus. The Romans latinised it into 'Mona', facitus referring definitely to 'Monam insulam'.<ref>Confusion arose with the Isle of Man, also sometimes called Môn', and distinctions were invented, one of which developed eventually into 'Man'.</ref> 'Mon' is said to be a mutation of 'Bôn'," extremity', so that 'Ynvs Fôn' or 'Mona Insula'. would be 'Insula ultimo', 'The Farthest Isle'.

Other old names for Anglesey (probably bardic) are 'Ynys-y-cedeirn', 'The Heroes' Island', and 'Ynys-dywyll', 'The Shady Island'.

The geological formations of the Island are remarkably numerous in proportion to its area, and when to this is added considerable variety in their detail and distribution, the effect is to produce a geological complexity that is unusual even in the British Isles, complex as those are when contrasted with regions in the heart of continents, like the broad plains of Russia. The Mona Complex,<ref>For explanation of this term see pp. 37–39.</ref> the Ordovician and Carboniferous are the principal formations.

Most ancient, and most extensive, is the great Mona Complex, occupying nearly two-thirds of the area. It is regarded as almost certainly of Pre-Cambrian age, and includes a great variety of rocks, nearly all of which are in the condition of crystalline schists. Next in order are some small outliers of—uncertain age. Demonstrably Cambrian rocks have not been found, but of their former presence there is little doubt. Then follow extensive Ordovician rocks, including all divisions of the system, and containing many fossils. The Silurian is also represented, but only by its lowest sub-division, the Llandovery. Important igneous intrusions close the Lower Palaeozoic record, after which we enter upon a completely new series. At its base is a sheet of Old Red Sandstone, and then follows a varied sequence of Carboniferous deposits, ranging from the Limestone to productive Coal Measures, and the Red Measures, with which the sedimentary record of the Island closes. No Mesozoic rocks have been discovered, but there is no doubt that they once existed in the area. There is, however, a late series of dykes, so that Tertiary time is not unrepresented. Last of all come extensive Glacial drifts and Post-Glacial deposits. A tabular summary of the whole succession is given below.

LATER SUPERFICIAL DEPOSITS	Blown Sand, Marine and Fresh-water Alluvium, Submerged Forest Bed, Raised Beach, &c.
GLACIAL DEPOSITS	Moraines, Boulder-clays, Gravels.
TERTIARY	Basic Dykes.
CARBONIFEROUS	Red Measures.
	Coal Measures.
	Millstone Grit.

	Carboniferous Limestone Series.
OLD RED SANDSTONE	
METASOMATIC DEPOSITS	
PALAEOZOIC INTRUSIONS	Basic and Acid Sills and Dykes.
SILURIAN	Llandovery.
ORDOVICIAN	Harden.
	Glenkiln.
	Llanvirn.
	Arenig.
BARON HILL AND CAREG-ONEN ROCKS	
MONA COMPLEX	Penmynydd Zone of Metamorphism.
	Plutonic Intrusions.
	Holyhead Quartzite.
	South Stack Series.
	New Harbour Group.
	Skerries Group.
	Gwna Group.
	Fydlyn Group.
	Gneisses.