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## Chapter 1 introduction and physical features

The island of Arran is one of the classic regions of geology. It is famous for the great variety and interest of its igneous rocks, and especially for its richness in pitchstones. It has been the field of work of many illustrious geological pioneers — Hutton, Jameson, Playfair, Macculloch, Murchison, Sedgwick, Nicol, Allport, Sorby, and Judd; and among foreign geologists, Ami Boué, Zirkel, Vogelsang, and von Lasaulx. The interest of the island is enhanced by the beauty of its mountain scenery, its archaeology, and its instructiveness as a synopsis of the geology of Scotland, with the contrast of the Highland type in the northern part and the Lowland type in the south.

Arran is situated in the Firth of Clyde, lying about 15 miles from Ardrossan on the east, and about 4 miles from the Kintyre peninsula on the west. Its outline is that of an irregular ellipse, the long axis of which, 19 miles in length, extends in a south-south-east direction from the Cock of Arran to Bennan Head, and the short axis, 10 miles in length, from Machrie Bay to Corrygills. The area of Arran is estimated at 165 square miles, and its length of coastline at 60 miles. Two small islands are attached to Arran: Holy Island, about 2 miles long by half a mile wide, lying across the entrance to Lamlash Bay, and thus making one of the finest harbours in the west of Scotland; and Pladda, about half a mile in length, which lies off the south coast opposite Kildonan.

The most prominent headlands are the Cock of Arran on the north; Clauchlands Point, Kingscross Point, and Dippin Head, on the east; Bennan Head on the south; and Brown Head, Drumadoon Point, and Imachar Point, on the west. The deepest indentations are Brodick Bay and Lamlash Bay, both on the east coast. Loch Ranza is a fiord-like inlet on the north-east coast; and Catacol Bay, Machrie Bay, and Drumadoon Bay are wide but shallow recesses on the west coast.

The most marked physiographic and scenic feature of Arran is the contrast between the rugged granite mountains of the northern half of the island, and the much lower, undulating, plateau and moorland country of the southern part. G.W.T.

The mountains are contained within a nearly circular area about 8 miles by 7 miles across. All the principal streams take their rise in this mass, or from a smaller oval area near the centre of the southern edge of the sheet, which is belted by a granitic ring, and in which are the hills of Ard Bheinn (1676 feet), A' Chruach (1679 feet), and Beinn Bhreac (1649 feet). The streams that flow eastward from this smaller mass of high ground are Benlister Burn and Glen-cloy Burn, while those which flow to the west are tributaries of the Machrie Water and the Black Water.

The larger granitic area is divided into two nearly equal parts by the glens of Iorsa Water and Easan Biorach, which coalesce at the watershed of Loch na Davie. The Iorsa stream, which is about 8 miles long, is the largest in the island. Some of its branches drain the western part of the high ground, which is not so high and rugged as the eastern half, nearly all the highest hills being round or flat topped. Beinn Bharrain (2345 feet) and Beinn Bhreac (2333 feet) — the highest points of a continuous ridge; Meall nan Damh (1870 feet) and Meall Mtn (1602 feet), isolated conical hills; and another Beinn Bhreac (1881 feet), west of Loch na Davie, are the most important summits in this part, which is partly drained by Allt Gobhlach and the stream which flows north down Glen Catacol.

From the masses of Caisteal Abhail (2817 feet) and Cir Mhòr (2618 feet) diverge ridges that embrace the glens of Sannox and North Sannox, which drain eastwards, and that of Rosa, <ref>Glen Rosie on One-inch Geological Map (1910).</ref> which drains southward into Brodick Bay. One ridge with a gradual descent runs northwards from Caisteal Abhail to Creag Dubh, and bounds the valley of North Sannox on the west. Another, and very rugged, ridge runs eastward to the rift of Ceum na Caillich, and then in a smooth outline continues in a north-east direction past Suidhe Fhearghas (2156 feet). This ridge separates the two Sannox glens. A high col, the lowest part of which is 2046 feet, joins Caisteal Abhail to Cir Mhòr. In a south-south-west direction from this peaky mountain we have successively A' Chir (the most difficult to traverse in the whole island), Beinn Tarsuinn (2706 feet), and Beinn Nuis (2597 feet). The height of A' Chir is not given, but is probably about 2335 feet, and the pass to the south of it is over 2000 feet, while the pass on the north side is 1933 feet. The highest point of Beinn a' Chliabhain, which is on the west side of Glen Rosa, is 2217 feet in height. Cir Mhòr is connected with the Goatfell range by the low col of The Saddle (1414 feet), which has a precipitous and difficult descent on the Sannox side. Goatfell (2866 feet), the highest summit in the island, is on a continuous range

of high ground, over 2000 feet in elevation, which runs in a curved line from Cioch na h-Oighe (2168 feet), round the head of the White Water, past Goatfell, some half a mile down its southern spur. For three-quarters of this distance the ridge is nearly everywhere over 2500 feet, and only falls slightly below that height at one or two points. From its highest point north of Goatfell (2716 feet), a ridge which bounds the White Water on the north runs eastward to Am Binnein (2172 feet). W.G.

The southern part of the island has not the striking scenery of the north. It is mostly an undulating tableland, the highest part of which rises to 1500 feet above sea-level. The watershed between the streams flowing east and west runs in a north-westerly direction from Dippin to the head of the Monamore Glen, and for the greater part of its course it is above the 800-foot contour. Being much nearer the east than the west coast, it follows that the longer and more important streams are on the west side. Those on the east have a rapid fall, and their courses are generally diversified by waterfalls. Very little of the ground is below 100 feet in elevation. The principal exceptions are the valley of the Black Water, and the coastal strip about Slidderly.

The highest point is about 1500 feet above the sea, some 40 yards to the north-east of the ordnance station on Tighvein, which is 1497 feet. Cnoc Dubh, to the north-west of Tighvein, is 1385 feet high. Sguiler (1332 feet), and The Ross, Monamore Glen (over 1000 feet), are the most conspicuous hills behind Lamlash. The ordnance station on The Ross is 989 feet; and many of the stations marked in the southern half of the map are on gently rising hilltops which are not conspicuous from a distance. The highest hill in the central area is Cnoc a' Chapuill (1369 feet); Cnoc na Dail, a prominent hill to the south of this, is 1158 feet. To the west are Tormusk (1259 feet) and Cnoc an Loch (1107 feet). Cnoc Ballygown (735 feet) is a steep hill overhanging the valley of the Black Water; and east of Brown Head there is a somewhat isolated mass of high ground, the highest point of which is Cnoc Reamhar (737 feet). Several of the hills in the south-eastern part of the island, as Levencorroch and Auchenhew Hills (909 feet), are flat-topped and covered with peat, though they often have good scars and marked topographic features round their borders. Cnoc na Garbad (959 feet), Cnoc na Comhairle (913 feet), and Borrach (869 feet) are prominent hills in the region behind Whiting Bay.

The coast is for the most part bold and rocky, with fine cliffs at Dippin, Bennan, and Drumadoon. The island of Pladda, though rocky, reaches a height of but 70 feet, and forms a great contrast to Holy Island, which rises abruptly from the sea to a height of 1030 feet in a series of crags, making a feature almost as striking as Ailsa Craig. The eastern side is the steeper, the horizontal distance from the sea-level to the ordnance station on the summit being only 1100 feet, so that the average slope is nearly 1 in 1, or about 45°. W.G. (MS.)

The streams of the northern mountain area comprise both a minor radial system and a major 'through' system of drainage. The radial streams with their trends are listed by Prof. J. W. Gregory <ref>The Pre-Glacial Valleys of Arran and Snowdon, *Geol. Mag.*, vol. lvii., 1920, p. 150.</ref> as follows:

N.E. — Two streams of North Glen Sannox.

E.N.E. — Glen Sannox.

E. — Four streams near Corrie, of which the longest is the White Water Burn.

S.E. — Merkland Burn and Cnocan Burn, coming from Goatfell.

S. — The eastern Garbh Allt from Beinn Nuis; and Auchencar Burn from S.S.W. of Beinn Tarsuinn.

S.W. — Glen Scaftigill.

W — Eight burns, of which the longest is the Allt Gobhlach.

N.W. — Abhainn Bheag.

The above are all of secondary importance. The greater streams run, in three major valleys which cut across the granite range from north to south. In the longest of these valleys are the Iorsa and the Easan Biorach, running respectively south

and north from a col at 1182 feet above sea-level in the very heart of the mountains. The Rosa Water occurs farther east, and over the pass of The Saddle its valley is continued by Glen Sannox, bending round gradually to the north-east. The third main valley is that of Glen Catacol and Glen Scaftigill, on the western side of the mountains. In the extreme north-east is another major valley consisting of Glen Chalmadale and North Glen Sannox. These valleys contain the most considerable streams in Arran, the largest being the Iorsa, with a length of about 8 miles.

The principal streams in the central part of the island are Glen Shurig, Glen Cloy, with its two headwaters, Glen Ormidale and Glen Dubh, the Lag a' Bheith (Birch Glen), and Benlister Glen, on the east. The first three debouch into Brodick Bay; the last into Lamlash Bay. On the western side of the watershed there is first the Machrie Water, with its tributaries, Gleann Easbuig (Bishop's Glen), the western Garbh Allt, and Glen Craigag draining the 'central vent' area; and the Black Water entering Drumadoon Bay, with its main tributary the Ballymichael Burn and its headwater the Clauchan Burn.

In the southern third of the island the Slidery Water is the longest stream and drains the largest area. Its principal sources rise near Cnoc a' Chapuill and Cnoc Dubh. The Kilmory Water has its sources in the high ground of Tighvein. It has an important tributary on the north side called the Cloined Burn (Allt Mòr Cloined). Some small streams run southward, and have short courses and a rapid fall. The most important of these is Allt Mhòr, which rises in Loch Garbad. A fine waterfall occurs in this stream east of Auchenhew Hill. On the east side of the island the Monamore Burn and the Kingscross Burn both rise in Urie Loch. The former of these streams runs at first in a north-north-east direction and then turns eastward to flow into Lamlash Bay; while the latter takes an easterly course and runs into Whiting Bay. The largest burn on the eastern side is that which rises to the south-east of Urie Loch, and flows south-east, and then east into Whiting Bay. This burn, which is called the Allt Dhepin in its upper part, has a fine series of waterfalls; and in its lower course, where it is called the Glen Ashdale Burn, it possesses the highest fall in Arran. This fall is in two leaps — a higher one of about 40 feet, and a lower of 100 feet. In its setting of pine wood this is the most beautiful scenic feature of southern Arran. G.W.T.

Several freshwater lochs diversify the surface of Arran, nearly all of which are in the western part of the island. The largest is Loch Tanna, which is a mile in length, but not particularly interesting, being immediately surrounded by low-lying, peat-covered ground. It is probably shallow, and drift-dammed. The Dubh Loch to the west of it is partly surrounded by rock, and may be a rock basin. Loch Nuis and Loch Iorsa are shallow lochs, probably in drift, as is also Loch na Davie. Two small lochs occur to the south-west of Sail Chalmadale, one of which is not on the Ordnance maps. The finest of the lochs is Loch Chorein Lochain at a height of 1080 feet above the sea, picturesquely surrounded by granite crags between Meall nan Damh and Meall Biorach. W.G.

Four small freshwater lochs are found in the southern half of the island. Loch Cnoc an Loch, the largest, is 1004 feet above sea-level on the high ground east of the Black Water. From it rises a tributary of the Clauchan Burn. Urie Loch, the source of the Monamore Burn, has a dam at its outlet, and when the loch is high it overflows at its head, and becomes also the source of the Kingscross Burn. This loch is a quarter of a mile in length, and is 1329 feet above sea-level. A mile to the south-east of this lies Loch na Leirg, 250 yards long and 1024 feet above sea-level. Loch Garbad, 350 yards long, and at a height of 759 feet, is the source of the Allt Mòr., which enters the sea east of Auchenhew. This loch is surrounded by crags, and appears to be a moderately deep rock basin. W.G. (MS.)

Around the coasts of Arran is a narrow strip of low ground, usually less than a quarter of a mile wide, consisting of the various raised beaches and rock terraces which fringe the island. This feature expands to a width of a mile or more in a few places, as in Brodick Bay and Lamlash Bay on the east coast; Slidery on the south; Drumadoon Bay, with the valley of the Black Water, and Machrie Bay on the west; and Catacol Bay and Loch Ranza in the north. The ground rises abruptly from the inner margins of this feature. Occasionally the coast is bold and rocky, and forms fine cliffs, as at Dippin, Bennan, and Drumadoon. There are important remnants of high-level plateaus in the interior of the island, notably the '1000-foot' platform surrounding the northern mountains (Frontispiece); but these are more fully dealt with in a later chapter (p. 256), G.W.T.