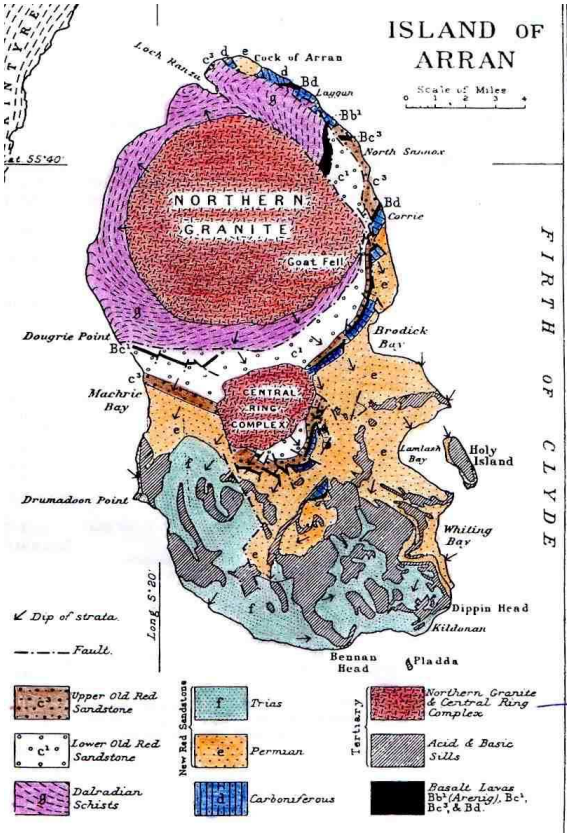
FGS field trip to the Isle of Arran, April 2005

At the end of April 2005, 14 members of the Society went on a week-long field trip to the Isle of Arran led by Tony Benfield, Director of Geocourses. The party was lucky to enjoy a fine spell of weather, 6 out of the 8 days on the island being mainly sunny with clear-blue skies - only twice were the waterproofs needed, and then, only for an hour or two on each occasion. The Group was fortunate in that it was able to have the loan of the Island's Community Bus for the whole its stay, which meant that the party could travel as-one, with the advantage that this brought of having the leader on-board together with his informative geological commentary as we journeyed around.

The overall geology of the Island was adequately described by Cath Clemesha in her article which appeared in the February 2004 edition of the Newsletter, the main points of which are repeated below. The photographs accompanying this present article were taken by Peter Wood, Ian Hacker and Shirley Stephens.



"Arran is popular for geology students as there are rocks from Cambrian to Cretaceous age, the north being a continuation of the Highland Region north of the Highland Boundary Fault, and the south being a continuation of the Midland Valley of Scotland. There are Tertiary igneous intrusions on Goat Fell in the north, the ring dykes in the Central Ring Complex and in the Lamlash cone sheet complex in the south (see map).

The dykes are basic and acidic (dolerite, and olivine dolerite which is called crinanite; and pitchstone, felsite and quartz-feldspar porphyry) The best places to see them are along the south coast around Bennan Head and the west coast north of Blackwaterfoot. On the beach below Kildonan there is a crinanite dyke, which was dark greenish brown with darker spots of olivine. Crinanite can also have white specks when the olivine has been altered to analcime. The quartz-feldspar porphyry dyke we studied on the beach near Drumadoon was a feeder dyke for the prominent Drumadoon sill.

Sills can be seen in a lot of the high ground round the coast and in offshore islands, such as Holy Island in the south-east and Pladda in the south. They are also mainly crinanite or quartz-feldspar porphyry. There is a crinanite sill at Dippen Head near Kildonan and a quartz-feldspar porphyry sill at Drumadoon. Here it looks as though there had been a dolerite sill into which the later quartz-feldspar porphyry was intruded. The dolerite can be seen at the base (the top assumed to have been eroded away.)

Most of the coastal plain is known as the "25 foot" raised beach dated at about 6500 BP. The best place to see the old cliff line is at Dougrie on the west coast where the cliffs are of Devonian conglomerate with numerous caves at the old sea level. There is another layer of raised beach at about 1000ft.which can be seen in Glen Catacol.

The contact between the Dalradian schists and the granite is most obvious in the stream-bed in North Glen Sannox; Glen Catacol provided excellent examples of lateral and terminal moraines, and a change in vegetation in the hillside indicated the schist/granite junction.

On the foreshore at Corrie one can walk south through Old Red Sandstone, Carboniferous and Permian strata steeply dipping to the south. The Old Red Sandstone conglomerate is easy to identify; then comes the fluviatile sandstones of Devonian or Carboniferous age, followed by amygdaloidal basalt and agglomerate. After that most of the shore is covered with boulders and it often difficult to see the many layers of Carboniferous limestone and incomplete Yoredale cycles.

Finally, an excellent example of Hutton's Unconformity can be seen north of Lochranza where Dalradian schists dipping steeply to the south-east are overlain by gently dipping sandstones of Lower Carboniferous age, a gap of about 150 million years."

Brodick from Goat Fell

View from near the summit of Goat Fell, looking south-east towards Brodick. Towards the top of the picture, the large bay is Lamlash Bay (where the FGS party stayed) with the prominent conical peak of Holy Island. The granite crag in the centre of the picture is Coire nam Meann.

Pillow lavas of North Glen Sannox.

In North Sannox Burn, about half a mile west of North Sannox Bridge on the A841, is this exposure of Dalradian pillow lavas, which are steeply dipping and 'younging' down stream to the east. Some show chilled margins.

Drumadoon Sill

View of the Tertiary Drumadoon Sill, a 30 metre high quartz feldspar porphyry intrusion with well developed columnar jointing, intruded into red marls and siltstones of the Triassic Auchenhew Beds. We also saw feeder dykes exposed on the shore. View looking north-east from Drumadoon Point, near Blackwaterfoot, in south-west Arran.

Hutton's Unconformity

This unconformity, discovered in 1787 by James Hutton, was the first of three he found. This view, looking roughly south, shows Dalradian schists at the base, which dip steeply to the SE. (Here he first realised that these sediments represent the products of erosion, transport, deposition, burial, heating and folding) They are stained red, probably due to weathering in the late Palaeozoic. Above the unconformity, the fluviatile lower Carboniferous sediments dip gently to the NW.

Dalradian Schists

On the west coast in this shore section at Imachar Point are highly deformed Dalradian schists.

Dyke in Permian at Fairy Dell, Lochranza

Tertiary, basalt dyke cutting through red Permian sediments at Fairy Dell, 1.25 km north-east of Loch Ranza on northern-most tip of Arran.

Many of the dykes seen along this coastline are associated with the opening of the Atlantic Ocean