
Survey photographs taken as part of the mapping of Arran

[P214230](#) B00321 Distant views of Goat Fell from Brodick, Arran. A mountain composed of granite. [NR 9910 4160]

[P214229](#) B00314 Shore, S. of Drumadoon, SW coast of Arran. Inclined Tertiary dolerite dykes intrusive in Triassic sandstone. [NR 8870 2860]

[P214228](#) B00313 Shore at Blackwaterfoot, SW coast of Arran. Curved flow-structure in felsite intrusive in Triassic sandstone. [NR 8940 2830]

[P214227](#) B00312 Shore at Blackwaterfoot, SW coast of Arran. Curved flow-structure in felsite intrusive in Triassic sandstone. [NR 8940 2830]

[P214226](#) B00311 Shore at Blackwaterfoot, SW coast of Arran. Columnar felsite being smoothed and ground down by the action of the sea. [NR 8940 2830]

[P214225](#) B00310 Shore at Blackwaterfoot, SW coast of Arran. Curved jointing in porphyritic-felsite sill. [NR 8940 2830]

[P214224](#) B00309 1.609 km. S. of Blackwaterfoot, SW coast of Arran. Jointing in sill of quartz-porphyry. Cliff and cave on old shore line of raised beach, shore at 'Preaching Cave'. [NR 9000 2660]

[P214231](#) B00323 S. side of Brodick Bay, E. coast of Arran. Basalt dyke cutting red Triassic sandstone. The sandstone hardened and bleached white near edge of dyke. [NS 0250 3550]

[P214216](#) B00295 Auchenhew shore, W. of Kildonan, S. Arran. Atmospheric weathering of calcareous sandstone. [NS 0150 2120]

[P214215](#) B00294 Bennan Head, S. coast of Arran. Inclusion of sandstone in dolerite, at 'Black Cave'. [NR 9940 2030]

[P214214](#) B00293 Bennan Head, S. coast of Arran. Cliff of dolerite formed by the 'Bennan Head Sill'. The slope of cliff determined by columnar jointing. [NR 9940 2030]

[P214213](#) B00292 Bennan Head, S. coast of Arran. Cliff of dolerite formed by the 'Bennan Head Sill'. The slope of cliff determined by columnar jointing. [NR 9940 2030]

[P214212](#) B00291 Bennan Head, S. coast of Arran. Recent sea cave ('Black Cave') cut in sill of columnar dolerite. [NR 9940 2030]

[P214211](#) B00287 Bennan Head, S. coast of Arran. Looking W. Distant views of the Bennan Head dolerite sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. [NR 9940 2030]

[P214210](#) B00286 Bennan Head, S. coast of Arran. Looking W. Distant views of the Bennan Head dolerite sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. [NR 9940 2030]

[P214209](#) B00285 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214208](#) B00284 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214207](#) B00282 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214206](#) B00281 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214205](#) B00280 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214204](#) B00279 Shore between Kildonan and Bennan Head, S. coast of Arran. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. [NS 0360 2090]

[P214203](#) B00274 Pladda Island, SE coast of Arran. Tertiary columnar dolerite sill intrusive in Triassic sandstone. The foreground represents rock-notch of raised beach. [NS 0250 1950]

[P214202](#) B00273 Pladda Island, SE coast of Arran. Tertiary columnar dolerite sill intrusive in Triassic sandstone. The foreground represents rock-notch of raised beach. [NS 0250 1950]

[P214201](#) B00272 Pladda Island, SE coast of Arran. Tertiary columnar dolerite sill intrusive in Triassic sandstone. The foreground represents rock-notch of raised beach. [NS 0250 1950]

[P214200](#) B00271 Shore, between Auchenhew and Levenorroch, S. coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0100 2110]

[P214199](#) B00269 Shore, between Auchenhew and Levenorroch, S. coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0100 2110]

[P214198](#) B00268 Shore, near Porta Buidhe, S. coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0260 2090]

[P214197](#) B00267 Shore, near Porta Buidhe, S. coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0260 2090]

[P214196](#) B00266 Shore at Porta Buidhe, W. of Kildonan Castle, S. coast of Arran. Tertiary dolerite dyke, showing upper limit exposed by recent denudation. In the foreground the dyke is yet covered by the Triassic sandstone. [NS 0260 2090]

[P214195](#) B00265 Shore, W. of Kildonan Castle, SE coast of Arran. To show bending of Tertiary dolerite dyke cutting Triassic sandstone. [NS 0350 2080]

[P214194](#) B00264 Shore, W. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes intrusive in Triassic sandstone, the sandstone being hardened near the edge of dyke. [NS 0350 2080]

[P214193](#) B00263 Shore, W. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes intrusive in Triassic sandstone, the sandstone being hardened near the edge of dyke. [NS 0350 2080]

[P214192](#) B00262 Shore, W. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes intrusive in Triassic sandstone, the sandstone being hardened near the edge of dyke. [NS 0350 2080]

[P214191](#) B00260 Shore, W. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes intrusive in Triassic sandstone, the sandstone being hardened near the edge of dyke. [NS 0350 2080]

[P214190](#) B00259 Kildonan shore, SE coast of Arran. Tertiary dolerite sill ('Kildonan Castle Sill') intrusive in Triassic Sandstone. [NS 0350 2150]

[P214189](#) B00257 Kildonan shore, SE coast of Arran. Tertiary dolerite sill ('Kildonan Castle Sill') intrusive in Triassic sandstone. [NS 0350 2150]

[P214188](#) B00256 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0370 2100]

[P214187](#) B00255 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. [NS 0370 2100]

[P214186](#) B00254 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dyke intrusive in Triassic sandstone, the sandstone being hardened near edge of dyke. [NS 0370 2100]

[P214185](#) B00253 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dyke cutting Triassic sandstone, showing columnar structure set up at right-angles to planes of cooling. [NS 0370 2100]

[P214184](#) B00252 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dyke cutting Triassic sandstone, showing columnar structure set up at right-angles to planes of cooling. [NS 0370 2100]

[P214183](#) B00251 A little E. of Kildonan Castle, SE coast of Arran. Tertiary dolerite dyke cutting Triassic sandstone, showing spheroidal weathering of ends of columns. [NS 0370 2100]

[P214182](#) B00249 Porta Leacach, SE coast of Arran. Tertiary basalt dyke (0.61 m. broad) cutting Triassic sandstones. [NS 0420 2140]

[P214181](#) B00247 Porta Leacach, SE coast of Arran. Upper surface of dolerite sill showing ends of columns at right-angles to planes of cooling. [NS 0420 2140]

[P214180](#) B00246 Porta Leacach, SE coast of Arran. Upper surface of dolerite sill showing ends of columns at right-angles to planes of cooling. [NS 0420 2140]

[P214179](#) B00242 Dippin Head, SE coast of Arran. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. [NS 0510 2220]

[P214178](#) B00241 Dippin Head, SE coast of Arran. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. [NS 0510 2220]

[P214177](#) B00240 Dippin Head, SE coast of Arran. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. [NS 0510 2220]

[P214176](#) B00239 Dippin Head, SE coast of Arran. General views of great columnar dolerite sill ('Dippin Head Sill') in Triassic sandstone. Raised beach in foreground. [NS 0510 2220]

[P214175](#) B00238 Dippin Head, SE coast of Arran. General views of great columnar dolerite sill ('Dippin Head Sill') in Triassic sandstone. Raised beach in foreground. [NS 0510 2220]

[P214174](#) B00237 Dippin Head, SE coast of Arran. General views of great columnar dolerite sill ('Dippin Head Sill') in Triassic sandstone. Raised beach in foreground. [NS 0510 2220]

[P214173](#) B00235 Largybeg Point, S. of Whiting Bay, SE coast of Arran. Carious weathering of limey sandstone. [NS 0540 2330]

[P214172](#) B00229 Kingscross Point, N. end of Whiting Bay, SE coast of Arran. Veins of basalt invading sandstone. [NS 0560 2830]

[P214171](#) B00228 Kingscross Point, N. end of Whiting Bay, Arran. Junction of Triassic sandstone and Tertiary dolerite sill. [NS 0560 2830]

[P214170](#) B00225 Whiting Bay, SE coast of Arran. Tertiary dolerite dykes intrusive in Triassic sandstones. [NS 0450 2650]

[P214169](#) B00223 SE end of Holy Island, E. coast of Arran. Basalt dyke cutting through great felsitic sill. [NS 0500 2500]

[P214168](#) B00222 E. side of Holy Island, E. coast of Arran. Great felsite sill above Triassic sandstones. [NS 0500 2500]

[P214167](#) B00221 E. side of Holy Island, E. coast of Arran. Cliffs of columnar felsite. [NS 0500 2500]

[P214166](#) B00220 E. side of Holy Island, E. coast of Arran. Cliffs of columnar felsite. [NS 0500 2500]

[P214223](#) B00308 Near Brown Head, SW coast of Arran. Near Brown Head, SW coast of Arran. Section of glacial drift. [NR 9050 2550]

[P214221](#) B00304 Eas Mor, Auchenhew Burn, 2.414 km. NW of Kildonan Castle, SE Arran. Looking N. Eas Mor, Auchenhew Burn, 2.414 km. NW of Kildonan Castle, SE Arran. Looking N. Composite dolerite sill overlying Triassic sandstones and shales, giving rise to waterfall and landslips by the undermining of the softer sedimentary rocks. [NS 0200 2230]

[P214220](#) B00300 Shore cliff at Kilbride Bennan, 2.414 km. W. of Bennan Head, S. Arran. Tertiary basalt dykes cutting Triassic sandstones and marls. [NR 9740 2130]

[P214219](#) B00299 Shore cliff at Kilbride Bennan, 2.414 km. W. of Bennan Head, S. Arran. Tertiary basalt dykes cutting Triassic sandstones and marls. [NR 9740 2130]

[P214218](#) B00298 Shore cliff, Auchenlew, S. Arran. Fault in Triassic sandstones and marls. [NS 0370 2170]

[P214217](#) B00297 Auchenhew, S. Arran. Tertiary basalt dyke cutting Triassic sandstones and marls, shore cliff. [NS 0370 2170]

[P001732](#) B00320 Distant views of Goat Fell from Brodick, Arran, Buteshire. Permian sandstone on foreshore. Foothills of Dalradian gritty psammite and Devonian sandstone. Goat Fell in background is part of the Arran Northern Granite. Distant views of Goat Fell from Brodick, Arran, Buteshire. Permian sandstone on foreshore. Foothills of Dalradian gritty psammite and Devonian sandstone. Goat Fell in background is part of the Arran Northern Granite. A few exposures of Permian sandstone on foreshore. In the foothills, the Highland Boundary fault, which has been bent during intrusion of the Northern Granite, separates Dalradian gritty psammite to the north-west from Devonian sandstone. Goat Fell in background is part of the Arran Northern Granite. The coarse-grained granite has been weathered into sharp aretes separating the corries; extensive granite scree slopes occur below the ridges. [NR 9910 4160]

[P001731](#) B00319 King's Cave, 1.5 km. north of Drumadoon, south-west Arran, Buteshire. Old sea caves cut in cliff of Triassic sandstone at edge of raised beach. King's Cave, 1.5 km. north of Drumadoon, south-west Arran, Buteshire. Old sea caves cut in cliff of Triassic sandstone at edge of raised beach. Marine erosion during a period of high sea level shortly after the latest glaciation eroded the soft Permo-Triassic sandstone to form caves where King Robert Bruce is said to have sheltered. Note the large-scale dune cross-bedding in the sandstones. The caves are partly controlled by vertical jointing in the sandstones (right edge of photo). [NR 8850 3050]

[P001730](#) B00318 King's Cave, 1.5 km. north of Drumadoon, south-west Arran, Buteshire. Old sea caves cut into a cliff of massive Triassic sandstone at the edge of a raised beach. King's Cave, 1.5 km. north of Drumadoon, south-west Arran, Buteshire. Old sea caves cut into a cliff of massive Triassic sandstone at the edge of a raised beach. The postglacial raised beach is a marked feature on the coastline of Arran, and is typically c.10 metres above modern sea level. Marine erosion during the period of high sea level eroded the lower, softer sandstone to form caves where King Robert Bruce is said to have sheltered. Note the large-scale dune cross-bedding in the sandstones. [NR 8850 3050]

[P001729](#) B00317 Drumadoon, south-west Arran, Buteshire. Sill of columnar quartz porphyry, with little sill of basalt and beds of Triassic sandstone and shale below. Drumadoon, south-west Arran, Buteshire. Sill of columnar quartz porphyry,

with little sill of basalt and beds of Triassic sandstone and shale below. Composite sill. Basaltic and granitic magmas have partly mixed prior to intrusion. The main body of the sill is quartz porphyry, an acid rock which, however, contains inclusions of more basic rock. The outer skin of quartz dolerite contains quartz xenocrysts, indicating some mixing of magma before intrusion. Columnar jointing well developed in the main quartz porphyry. The quartz dolerite is the darker rock with closer jointing just above the contact. Dune cross-bedding visible in sandstones below contact. [NR 8850 2850]

[P001728](#) B00315 Drumadoon, south-west Arran, Buteshire. Composite sill of quartz porphyry with quartz dolerite margin. Beds of Triassic sandstone and shale below. Raised beach in foreground. Drumadoon, south-west Arran, Buteshire. Composite sill of quartz porphyry with quartz dolerite margin. Beds of Triassic sandstone and shale below. Raised beach in foreground. Composite sill. Basaltic and granitic magmas have partly mixed prior to intrusion. The main body of the sill is quartz porphyry, an acid rock which, however, contains inclusions of more basic rock. The outer skin of quartz dolerite contains quartz xenocrysts, indicating some mixing of magma before intrusion. Columnar jointing well developed in the main quartz porphyry. Scree slope with large blocks below sill. Flat grassy area in foreground is raised beach. [NR 8850 2850]

[P001727](#) B00289 Bennan Head, south coast of Arran, Buteshire. Looking east. Distant views of the Bennan Head composite dolerite - quartz porphyry sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. Bennan Head, south coast of Arran, Buteshire. Looking east. Distant views of the Bennan Head composite dolerite - quartz porphyry sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. The upper part of the cliff is formed of quartz porphyry, with dolerite near the base of the sill, which becomes lower eastwards and reaches sea level near the point. North-south dolerite dykes on the foreshore form positive features and stick out into the sea. Note the apparent absence of dykes cutting the sill, which must post-date the dykes. The raised beach at the foot of the cliffs was formed during a period of high sea level shortly after the end of the latest glaciation. [NR 9940 2030]

[P001726](#) B00288 Bennan Head, south coast of Arran, Buteshire. Looking west. Distant views of the Bennan Head composite dolerite - quartz porphyry sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. Bennan Head, south coast of Arran, Buteshire. Looking west. Distant views of the Bennan Head composite dolerite - quartz porphyry sill intrusive in Triassic sandstone. Dolerite dykes on foreshore and raised beach in foreground. The upper part of the cliff is formed of quartz porphyry, with dolerite near the base of the sill, which becomes lower westwards and reaches sea level near the point. At the right edge of the photo, horizontally-bedded sandstone is visible under the dolerite. North-south dolerite dykes occur on the foreshore. Note the apparent absence of dykes cutting the sill, which must post-date the dykes. The raised beach at the foot of the cliffs was formed during a period of high sea level shortly after the end of the latest glaciation. [NR 9940 2030]

[P001725](#) B00277 Shore between Kildonan and Bennan Head, south coast of Arran, Buteshire. Bird's-eye views of Palaeocene dolerite dykes cutting Triassic sandstones. Shore between Kildonan and Bennan Head, south coast of Arran, Buteshire. Bird's-eye views of Palaeocene dolerite dykes cutting Triassic sandstones. The Arran centres mark the roots of two of the many volcanoes which formed in western Scotland during the opening of the North Atlantic, 55-60 million years ago. At this time the crust was stretched and thinned. Basaltic magma was intruded along the fissures, which in south Arran ran mainly north-south. Here basalt dykes form up to 10% of the thickness of the rocks (measured east-west). [NS 0360 2090]

[P001724](#) B00270 Shore, between Auchenhew and Levenorroch, south coast of Arran, Buteshire. Palaeocene dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. Shore, between Auchenhew and Levenorroch, south coast of Arran, Buteshire. Palaeocene dolerite dykes split by newer dolerite intrusions, forming compound dykes, intrusive in Triassic sandstone. Many dykes were intruded into the Triassic sandstones of south Arran. In places the earlier, already solidified dykes acted as conduits for later upwellings of magma. The narrow dyke of finer-grained closely-jointed basalt (upstanding, left) is earlier than the more widely-jointed dolerite (low ground, centre) which cooled more slowly. [NS 0100 2110]

[P001723](#) B00261 Shore, west of Kildonan Castle, south-east coast of Arran, Buteshire. Palaeocene dolerite dyke intrusive into Triassic sandstone, the sandstone being hardened near the edge of dyke. Shore, west of Kildonan Castle,

south-east coast of Arran, Buteshire. Palaeocene dolerite dyke intrusive into Triassic sandstone, the sandstone being hardened near the edge of dyke. The dyke in the foreground is about 3 metres wide. It is one of many intruded during the emplacement of the subvolcanic centres of north and central Arran. The dykes have fine-grained, chilled margins, and rather coarser-grained centres, which are more resistant to weathering. For about 4 metres on either side of the dyke, the heat of the intruding basaltic magma caused the sandstone to undergo recrystallization along grain boundaries. This baking process increases the hardness of the sandstone. [NS 0350 2080]

[P001722](#) B00250 A little east of Kildonan Castle, south-east coast of Arran, Buteshire. Side of Palaeocene dolerite dyke cutting Triassic sandstone, showing ends of columns at right-angles to planes of cooling. A little east of Kildonan Castle, south-east coast of Arran, Buteshire. Side of Palaeocene dolerite dyke cutting Triassic sandstone, showing ends of columns at right-angles to planes of cooling. Dykes form when magma is intruded up subvertical fissures. In Arran, most are associated with the volcanic episode which produced the central and northern volcanic centres. After intrusion, cooling was most rapid at the margins, and cracks developed preferentially at right-angles to the contacts. Hence roughly polygonal cracks separate roughly horizontal columns, in contrast to sills and lava flows where the columns are vertical. [NS 0370 2100]

[P001721](#) B00248 Porta Leacach, south-east coast of Arran, Buteshire. Tertiary basalt dyke (0.6 m. broad) cutting Triassic sandstones. Porta Leacach, south-east coast of Arran, Buteshire. Tertiary basalt dyke (0.6 m. broad) cutting Triassic sandstones. Pale, subhorizontally-bedded sandstone dips gently seaward. Joints are spaced c. 2 metres apart. The dyke (dark) is relatively fine-grained, because it is narrow, and therefore cooled quickly. Here its hardness is compensated by its relatively close (0.15 m.) jointing, and it does not stand proud of the sandstone. Most of the large loose blocks are dolerite, either from dykes or from the Dippin sill. [NS 0420 2140]

[P001720](#) B00245 Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Relatively slow cooling of the basaltic magma intruded into the Triassic sandstone produced a regular joint pattern, similar to that found in the centres of thick lava flows (Fingal's Cave, Giant's Causeway). The vertical joints are much more persistent than the later horizontal ones. Hence the rock breaks up into narrow columns, producing pinnacles. The fallen boulders are very large, producing rough, immobile scree. To the left of the cliffs the low ground is underlain by Triassic dune-bedded desert sandstones. [NS 0510 2220]

[P001719](#) B00244 Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Relatively slow cooling of the basaltic magma intruded into the Triassic sandstone produced a regular joint pattern, similar to that found in the centres of thick lava flows (Fingal's Cave, Giant's Causeway). The vertical joints are much more persistent than the later horizontal ones. Hence the rock breaks up into narrow columns, producing pinnacles. The fallen boulders are very large, producing rough, immobile scree. [NS 0510 2220]

[P001718](#) B00243 Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Dippin Head, south-east coast of Arran, Buteshire. Weathering of Dippin Head columnar dolerite sill, giving rise to detached pinnacles and screes. Relatively slow cooling of the basaltic magma intruded into the Triassic sandstone produced a regular joint pattern, similar to that found in the centres of thick lava flows (Fingal's Cave, Giant's Causeway). The vertical joints are much more persistent than the later horizontal ones. Hence the rock breaks up into narrow columns, producing pinnacles. The fallen boulders are very large, producing rough, immobile scree. [NS 0510 2220]

[P001717](#) B00236 Dippin Head, south-east coast of Arran, Buteshire. General views of great columnar dolerite sill ('Dippin Head Sill') in Triassic sandstone. Raised beach in foreground. Dippin Head, south-east coast of Arran, Buteshire. General views of great columnar dolerite sill ('Dippin Head Sill') in Triassic sandstone. Raised beach in foreground. The line of crags marks the outcrop of the sill, which shows columnar jointing. On the lower slopes, large blocks of dolerite largely obscure the Triassic sandstone. At the base of the cliffs is the post-glacial raised beach, formed after the latest ice age, when the sea flooded the newly exposed land before the earth's crust could rise to compensate for removal of the

ice cap. [NS 0510 2220]

[P001716](#) B00234 Largybeg Point, south of Whiting Bay, south-east coast of Arran, Buteshire. Differential weathering of Triassic sandstone and Palaeocene intrusive dolerite, with great felsitic sill of Dippin Head and raised beach in distance. Largybeg Point, south of Whiting Bay, south-east coast of Arran, Buteshire. Differential weathering of Triassic sandstone and Palaeocene intrusive dolerite, with great felsitic sill of Dippin Head and raised beach in distance. The horizontally-bedded sandstones are relatively thin-bedded. The harder layers are calcareous, possibly tending to cornstones, indicating a desert environment. The dyke in the foreground stands proud because it is more resistant to weathering than the surrounding sandstone. Across the bay, the dolerite of Dippin Head was intruded at a slight angle to the bedding of the sandstone. The contacts appear to dip to the left. At the foot of the cliffs, the cottage is built on a raised beach, formed when the land had not fully recovered from the weight of ice pressing it down during the latest ice age. [NS 0540 2330]

[P001715](#) B00233 Largybeg Point, south of Whiting Bay, south-east coast of Arran, Buteshire. Differential weathering of Triassic sandstone and Palaeocene dolerite dyke. Largybeg Point, south of Whiting Bay, south-east coast of Arran, Buteshire. Differential weathering of Triassic sandstone and Palaeocene dolerite dyke. The horizontally-bedded sandstones are relatively thin-bedded. The harder layers are calcareous, possibly tending to cornstones, indicating a desert environment. The dyke on the left is about 2 metres wide. It is one of many intruded during the emplacement of the subvolcanic centres of north and central Arran. The dolerite is much more resistant to weathering than the sandstone, which has been eroded away leaving the dyke standing proud. Hence the name dyke. [NS 0540 2330]

[P001714](#) B00230 Near mouth of Glenashdale Burn, south end of Whiting Bay, Arran, Buteshire. Looking west. Differential weathering of Palaeocene sills intrusive into Triassic sandstones, giving rise to features on skyline. Near mouth of Glenashdale Burn, south end of Whiting Bay, Arran, Buteshire. Looking west. Differential weathering of Palaeocene sills intrusive into Triassic sandstones, giving rise to features on skyline. The Triassic dune-bedded sandstone, unexposed, was intruded by offshoots from the Arran volcanic complexes, which here formed subhorizontal sheets (sills). Being more resistant to weathering than the sandstone, they form craggy features which can be traced for several kilometres. [NS 0460 2520]

[P001713](#) B00227 Whiting Bay, south-east coast of Arran, Buteshire. Palaeocene dolerite dykes intrusive into Triassic sandstone. Whiting Bay, south-east coast of Arran, Buteshire. Palaeocene dolerite dykes intrusive into Triassic sandstone. The dyke in the foreground is about 5 metres wide. It is one of many intruded during the emplacement of the subvolcanic centres of north and central Arran. The dykes have fine-grained, chilled margins, and rather coarser-grained centres, which are more resistant to weathering. In the middle distance, the dyke splits in two. Exposures of the surrounding sandstone can be seen in the distance, left. [NS 0450 2650]

[P001712](#) B00226 Whiting Bay, south-east coast of Arran, Buteshire. Palaeocene dolerite dykes intrusive into Triassic sandstone. Whiting Bay, south-east coast of Arran, Buteshire. Palaeocene dolerite dykes intrusive into Triassic sandstone. The dyke in the centre of the photo is about 8 metres wide. It is one of many intruded during the emplacement of the subvolcanic centres of north and central Arran. The basaltic magma was intruded into cool country rock, and the dykes have fine-grained, chilled margins, and rather coarser-grained centres. Exposures of the surrounding sandstone can be seen in the middle distance, left. [NS 0450 2650]

[P001711](#) B00224 South-east end of Holy Island, Lamlash Bay, Arran, Buteshire. Quartz porphyry dyke cutting Triassic sandstone (below) and dolerite (above). South-east end of Holy Island, Lamlash Bay, Arran, Buteshire. Quartz porphyry dyke cutting Triassic sandstone (below) and dolerite (above). The dyke, c. 5 metres wide, forms a prominent vertical cliff. The quartz porphyry is well-jointed both parallel and perpendicular to its contacts. The pale sandstone is thickly bedded, and dune cross-bedding is visible in places. Half-way up the picture, the sandstone is intruded by a sill of dolerite, showing spheroidal weathering at some levels. The contact is, as far as can be seen, parallel to the bedding in the sandstones. [NS 0680 2870]

[P000249](#) B00322 Distant views of Goat Fell from Brodick, Arran. Buteshire. A mountain composed of granite. Note the boats in the foreground. Goat Fell, the highest summit on the island at 2866 feet is formed of part of a Tertiary central

igneous complex. Distant views of Goat Fell from Brodick, Arran. Buteshire. A mountain composed of granite. Note the boats in the foreground. Goat Fell, the highest summit on the island at 2866 feet is formed of part of a Tertiary central igneous complex. The granite of which Goat Fell is composed, is the older, outer Coarse Granite. Together with the younger, inner fine-grained granite they form the Northern Granite, a near-circular intrusion that dominates the north part of Arran. [NR 9910 4160]

[P000248](#) B00316 Drumadoon, south-west Arran. Buteshire. Sill of columnar quartz-porphyry, with a little sill of basalt and beds of Triassic sandstone and shale below. A raised beach is seen in the foreground. Drumadoon, south-west Arran. Buteshire. Sill of columnar quartz-porphyry, with a little sill of basalt and beds of Triassic sandstone and shale below. A raised beach is seen in the foreground. The sill is composite, consisting of a central mass of quartz-porphyry approaching 100 feet thick with a thin sheet of basalt at both top and bottom. The rock has a microcrystalline grey groundmass with phenocrysts of quartz (up to 6 mm. long) and feldspar up to 13 mm. long). [NR 8850 2850]

[P000246](#) B00305 Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking south down the gorge below the waterfall. Buteshire. Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking south down the gorge below the waterfall. Buteshire. On the left the Tertiary dolerite sill rests upon the Triassic marls, sandstones and shales. On the right several large landslips can be seen, the debris choking the stream. [NS 0200 2230]

[P000245](#) B00303 Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking north. Buteshire. A close-up of a waterfall flowing over a dolerite sill. Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking north. Buteshire. A close-up of a waterfall flowing over a dolerite sill. Composite dolerite sill overlying Triassic marls, sandstones and shales, giving rise to waterfall and landslips by the undermining of the softer sedimentary rocks. Beneath the fall the rocks are bent and broken by one or two small faults. [NS 0200 2230]

[P000244](#) B00302 Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking north. Buteshire. A waterfall flowing over a dolerite sill. Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking north. Buteshire. A waterfall flowing over a dolerite sill. The water falls over a 20-30 feet thick composite dolerite sill overlying Triassic marls, sandstones and shales. Note the fresh debris fallen from the sill on the right of the waterfall. [NS 0200 2230]

[P000243](#) B00301 Eas Mor, Auchenhew Burn, 2.414 km. north-west of Kildonan Castle, south-east Arran. Looking north. Buteshire. Composite dolerite sill overlying Triassic marls, sandstones and shales, giving rise to waterfall and landslips by the undermining of the softer sedimentary rocks. The waterfall has created an amphitheatre-shaped gorge. [NS 0200 2230]

[P000242](#) B00296 Stream section about 0.805 km. north of Kildonan Castle, south-east Arran. Buteshire. Spheroidal weathering of a dolerite sill intruded into Triassic sandstone. The stream shows a waterfall. Stream section about 0.805 km. north of Kildonan Castle, south-east Arran. Buteshire. Spheroidal weathering of a dolerite sill intruded into Triassic sandstone. The stream shows a waterfall. The spheroidal weathering is typical of that formed in well-jointed rocks such as basalts and dolerites. Water penetrates the intersecting joints so attacking blocks from all sides at once. Depth of decay is greater at the edges than along the flat faces so with continued weathering the blocks will become increasingly rounded. [NS 0370 2170]

[P000241](#) B00290 Black Cave, Bennan Head, south coast of Arran. Buteshire. A recent sea cave cut into a sill of columnar dolerite. Black Cave, Bennan Head, south coast of Arran. Buteshire. A recent sea cave cut into a sill of columnar dolerite. The dolerite is part of the Tertiary Bennan composite intrusion which consists in the main part, of a quartz feldspar-porphyry with minor hypersthene dolerite above and below. Black Cave represents part of the lower basaltic sheet. Several intercalations or floats of sedimentary rock are exposed in the cave, one is ten feet by three feet in cross-section. [NR 9940 2030]

[P000240](#) B00283 Shore between Kildonan and Bennan Head, south coast of Arran. Buteshire. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. Part of the famous Arran Dyke Swarm. There are several boats on the shore. Shore between Kildonan and Bennan Head, south coast of Arran. Buteshire. Bird's-eye views of Tertiary dolerite dykes cutting Triassic sandstones. Part of the famous Arran Dyke Swarm. There are several boats on the shore. The Arran dykes, formed by the intrusion of molten rock into the surrounding country rock vary in thickness from 0.3 to 30 metres and they have a general trend of north-north-west or north-west. In part of Arran 23.8 kilometres wide, there are 525 measured dykes with a combined thickness of 1650 metres. To accomodate this, the earth's crust must have stretched perpendicular to the most common dyke direction i.e. in an east-north-east direction by one kilometre in 14.4 kilometres. [NS 0360 2090]

[P000239](#) B00278 Shore between Kildonan and Bennan Head, south coast of Arran. Buteshire. A view along the coast illustrating the large number of Tertiary dolerite dykes of the Arran Dyke Swarm cutting Triassic sandstones. Shore between Kildonan and Bennan Head, south coast of Arran. Buteshire. A view along the coast illustrating the large number of Tertiary dolerite dykes of the Arran Dyke Swarm cutting Triassic sandstones. The emplacement of the dykes occurred during a phase of igneous activity c. 60 million years ago. On Arran it was associated with the intrusion of sills and the central igneous complex of the Northern Granite. The igneous activity on Arran was in turn part of a much greater Tertiary igneous province covering Skye, Mull, Rum, Ardnamurchan, Northern Ireland and several offshore centres such as St. Kilda. [NS 0360 2090]

[P000238](#) B00276 Pladda Island, south-east coast of Arran. Buteshire. A distant view of the 800 metre long and 21 metre high island of Pladda, formed almost entirely of a quartz-dolerite sill and also showing the rock-notch above a raised beach. In the foreground are dolerite dykes on foreshore. The lighthouse stands on the Tertiary columnar quartz-dolerite sill. The old cliff line and marine terrace are of the Main Postglacial Shoreline age, formed during submergence of the land which followed Boreal times. Since this time there has been a fall in sea level. [NS 0250 1950]

[P000237](#) B00275 Pladda Island, south-east coast of Arran, opposite Kildonan. Buteshire. A Tertiary columnar quartz-dolerite sill is intrusive into the Triassic sandstone. The photograph also gives a good view of the lighthouse. Pladda Island, south-east coast of Arran, opposite Kildonan. Buteshire. A Tertiary columnar quartz-dolerite sill is intrusive into the Triassic sandstone. The photograph also gives a good view of the lighthouse. The island, 800 metres long and 21 metres high is composed almost entirely of sill. The cliff represents an old cliff line formed by marine erosion, below which is a raised beach of the Main Postglacial Shoreline times, a time when the sea level was higher. [NS 0250 1950]

[P000236](#) B00258 Kildonan shore, south-east coast of Arran. Buteshire. A Tertiary sill ('Kildonan Castle Sill') intruded into Triassic sandstone. The foreground is the High Lateglacial Raised Beach platform. Kildonan shore, south-east coast of Arran. Buteshire. A Tertiary sill ('Kildonan Castle Sill') intruded into Triassic sandstone. The foreground is the High Lateglacial Raised Beach platform. The 15 to 20 feet thick sill is a craignurite felsite, a typical 'grey basalt' generally with scattered slender porphyritic feldspars. The centre of the sill is flow-vesiculated, the elongate cavities are filled with 'green earth' minerals and calcite. The rock weathers with a thick greyish crust but is blue-grey when fresh. Green earth minerals are naturally occurring silicates used as the base for green dyes and pigments. Typical green earth minerals are glauconite and celadonite. [NS 0350 2150]

[P000235](#) B00232 Glenashdale Falls, 2.146 km. west of Whiting Bay, south-east coast of Arran. Buteshire. A Tertiary dolerite sill intruded into Triassic sandstones, dipping upstream and giving rise to a waterfall. A close-up view. Glenashdale Falls, 2.146 km. west of Whiting Bay, south-east coast of Arran. Buteshire. A Tertiary dolerite sill intruded into Triassic sandstones, dipping upstream and giving rise to a waterfall. A close-up view. The waterfall is formed by the water falling over the harder, resistant quartz-dolerite and eroding away the softer Triassic sedimentary rocks beneath. In the cycle of river valley development the waterfall will eventually retreat up the valley, lose height and degrade to rapids and eventually smooth out entirely. [NS 0240 2480]

[P000234](#) B00231 Glenashdale Falls, 2.146 km. west of Whiting Bay, south-east coast of Arran. Buteshire. A Tertiary dolerite sill intruded into Triassic sandstones, dipping upstream and giving rise to a waterfall. Glenashdale Falls, 2.146 km. west of Whiting Bay, south-east coast of Arran. Buteshire. A Tertiary dolerite sill intruded into Triassic sandstones, dipping upstream and giving rise to a waterfall. The view shows part of the Glenashdale composite sill. It is estimated to

be about 64 metres thick in total and is formed of a lower felsite, the main quartz-dolerite, a feldspathic quartz-dolerite or craignurite and a upper felsite with sediment intercalations. [NS 0240 2480]

[P216728](#) C02880 Corrygills shore, Brodick Bay, Arran, Bute. Eroded rock surface of raised beach cut in Triassic sandstone. [NS 0350 3550]

[P216727](#) C02879 Corrygills shore, Brodick Bay, Arran, Bute. Raised beach cut out of Triassic sandstone. [NS 0350 3550]

[P216726](#) C02878 Corrygills shore, Brodick Bay, Arran, Bute. Raised beach cut out of Triassic sandstone. In the distance granite mass of Goat Fell. [NS 0350 3550]

[P215363](#) C00894 An Cumhann, 2.4 km. S. of Machrie Water Foot, W. coast of Arran. Pitchstone dyke cutting Triassic sandstone. [NR 8850 3250]

[P215362](#) C00893 N. of Machrie Bay, W. coast of Arran. Old sea cliff of nearly vertical Old Red Sandstone, at edge of raised beach. [NR 8950 3550]

[P215361](#) C00891 S. of Dougrie, W. coast of Arran. Old sea cliff cut out of vertical Lower Old Red Sandstone conglomerate, at edge of raised beach. [NR 8950 3650]

[P215360](#) C00890 S. of Dougrie, W. coast of Arran. Old sea cliff cut out of vertical Lower Old Red Sandstone conglomerate, at edge of raised beach. [NR 8950 3650]

[P215359](#) C00889 S. of Dougrie, W. coast of Arran. Old sea cliff cut out of vertical Lower Old Red Sandstone conglomerate, at edge of raised beach. [NR 8950 3650]

[P215358](#) C00888 Torsa Water Foot, Dougrie, W. coast of Arran. Raised beach 12, 19 m.-30.48 m. cut out of glacial deposits. [NR 8950 3650]

[P215357](#) C00887 Torsa Water Foot, Dougrie, W. coast of Arran. Raised beach 12, 19 m.-30.48 m. cut out of glacial deposits. [NR 8950 3650]

[P215356](#) C00886 Torsa Water Foot, Dougrie, W. coast of Arran. Raised beach 12, 19 m.-30.48 m. cut out of glacial deposits. [NR 8950 3650]

[P215355](#) C00885 Imachar, W. coast of Arran. Stacks on 'rock-notch' of raised beach. [NR 8650 4050]

[P215354](#) C00884 Imachar, W. coast of Arran. Cleavage in schistose rocks. [NR 8650 4050]

[P215353](#) C00883 Shore cliff opposite Imachar, W. coast of Arran. Contorted schist with quartz veins. [NR 8650 4050]

[P215350](#) C00878 Summit of Goat Fell, Arran. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors'. [NR 9950 4150]

[P215349](#) C00877 Summit of Goat Fell, Arran. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors'. [NR 9950 4150]

[P215348](#) C00876 Summit of Goat Fell, Arran. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors'. [NR 9950 4150]

[P215347](#) C00875 Summit of Goat Fell, Arran. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors'. [NR 9950 4150]

[P215346](#) C00873 Summit of Goat Fell, Arran. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors'. [NR 9950 4150]

[P215345](#) C00872 Goat Fell, Arran. A granite mountain showing characteristic weathering along the joints, giving rise to slabs and 'tors'. [NR 9950 4150]

[P215344](#) C00870 Goat Fell, Arran. A granite mountain showing characteristic weathering along the joints, giving rise to slabs and 'tors'. [NR 9950 4150]

[P215343](#) C00868 North Newton shore, 1.6 km. NNE of Loch Ranza, Arran. North Newton shore, 1.6 km. NNE of Loch Ranza, Arran. Unconformability, Lower Carboniferous sandstones and cornstones, resting unconformably on schists. [NR 9350 5150]

[P215342](#) C00867 Shore, W. of Loch Ranza, Arran. Strain slip cleavage in schistose grits. [NR 9250 5050]

[P215341](#) C00866 Near Loch Ranza, Arran. Gravel-pit in raised beach. [NR 9250 5050]

[P215340](#) C00865 Near foot of Gleann Easan Biorach, Loch Ranza, Arran. Moraine, with granite blocks, clinging to hillslope. [NR 9450 4950]

[P215339](#) C00864 Near foot of Gleann Easan Biorach, Loch Ranza, Arran. Moraine, with granite blocks, clinging to hillslope. [NR 9450 4950]

[P215338](#) C00860 Allt a' Chapuill, Glen Sannox, Arran. Granite sending tongues into schist and isolation of fragments. [NS 0050 4650]

[P215337](#) C00859 Allt a' Chapuill, Glen Sannox, Arran. Junction of granite and schist. [NS 0050 4650]

[P215336](#) C00858 Allt a' Chapuill, Glen Sannox, Arran. Junction of granite and schist. [NS 0050 4650]

[P215335](#) C00857 Allt a' Chapuill, Glen Sannox, Arran. Junction of granite and schist. [NS 0050 4650]

[P215334](#) C00856 Cioch na-h Oighe, S. side of Glen Sannox, Arran. Typical weathering of granite into slabs along joints running parallel to the ground surface. [NR 9950 4350]

[P215333](#) C00855 Cioch na-h Oighe, S. side of Glen Sannox, Arran. Typical weathering of granite into slabs along joints running parallel to the ground surface. [NR 9950 4350]

[P215332](#) C00854 S. side of North Glen Sannox (opposite Torr na Lair Brice), Arran. S. side of North Glen Sannox (opposite Torr na Lair Brice), Arran. Volcanic agglomerate (?) Lower Silurian. [NR 9950 4650]

[P215331](#) C00853 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Volcanic agglomerates (?) Lower Silurian. [NR 9950 4750]

[P215330](#) C00852 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Volcanic agglomerates (?) Lower Silurian. [NR 9950 4750]

[P215329](#) C00851 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215328](#) C00850 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215327](#) C00849 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215326](#) C00848 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215325](#) C00847 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215324](#) C00846 Torr na Lair Brice, N. side of North Glen Sannox, Arran. Pillow-structure in supposed Arenig lavas. [NR 9950 4750]

[P215323](#) C00845 Near Millstone Point, NE coast of Arran. Pillow-structure in Lower Carboniferous lavas. [NR 9850 5050]

[P215322](#) C00844 Near Millstone Point, NE coast of Arran. Pillow-structure in Lower Carboniferous lavas. [NR 9850 5050]

[P215321](#) C00843 Near Millstone Point, NE coast of Arran. Pillow-structure in Lower Carboniferous lavas. [NR 9850 5050]

[P215320](#) C00842 Near Millstone Point, NE coast of Arran. Pillow-structure in Lower Carboniferous lavas. [NR 9850 5050]

[P215319](#) C00841 The 'Fallen Rocks', near Millstone Point, 6.4 km. NNW of Corrie, Arran. Marine erosion of Upper Old Red Sandstone conglomerate. [NS 0050 4850]

[P215318](#) C00840 The 'Fallen Rocks', near Millstone Point, 6.4 km. NNW of Corrie, Arran. Masses of Upper Old Red Sandstone conglomerate displaced by landslip. [NS 0050 4850]

[P215317](#) C00839 The 'Fallen Rocks', near Millstone Point, 6.4 km. NNW of Corrie, Arran. Masses of Upper Old Red Sandstone conglomerate displaced by landslip. [NS 0050 4850]

[P215316](#) C00838 The 'Fallen Rocks', near Millstone Point, 6.4 km. NNW of Corrie, Arran. Landslip of Upper Old Red Sandstone conglomerate. [NS 0050 4850]

[P215315](#) C00836 N. side of Sannox Bay, Arran. Cliff of Upper Old Red Sandstone conglomerate. [NS 0150 4550]

[P215314](#) C00835 Shore N. of Corrie, Arran. Volcanic agglomerate (Cementstone Group: Lower Carboniferous). [NS 0250 4450]

[P215313](#) C00834 Shore near Farchan Mor, N. of Corrie, Arran. Section of Upper Old Red Sandstone conglomerate. [NS 0150 4550]

[P215312](#) C00833 Shore near Farchan Mor, N. of Corrie, Arran. Local unconformability in Upper Old Red Sandstone. On the left the coarse conglomerate overlaps soft red shaly sandstone. [NS 0150 4550]

[P215311](#) C00832 Shore near Farchan Mor, N. of Corrie, Arran. Irregularly bedded sandstone and conglomerate of Upper Old Red Sandstone age. [NS 0150 4550]

[P215310](#) C00831 Shore near Farchan Mor, N. of Corrie, Arran. Irregularly bedded sandstone and conglomerate of Upper Old Red Sandstone age. [NS 0150 4550]

[P215309](#) C00830 Shore near Farchan Mor, N. of Corrie, Arran. Irregularly bedded sandstone and conglomerate of Upper Old Red Sandstone age. [NS 0150 4550]

[P215308](#) C00829 Shore near schoolhouse, Corrie, Arran. Pillow-form structure in basic lavas (Lower Carboniferous). [NS 0250 4350]

[P215307](#) C00828 Shore near schoolhouse, Corrie, Arran. Pillow-form structure in basic lavas (Lower Carboniferous). [NS 0250 4350]

[P215306](#) C00827 Shore near schoolhouse, Corrie, Arran. Pillow-form structure in basic lavas (Lower Carboniferous). [NS 0250 4350]

[P215305](#) C00826 Corrie, Arran. Entrance of mines in the 'Corrie Limestone', (Lower Limestone of the Carboniferous Limestone Series). Productus giganteus band at (l). [NS 0250 4350]

[P215304](#) C00823 Shore, S. of Corrie, Arran. Shore, S. of Corrie, Arran. False-bedding in Triassic sandstone. [NS 0250 4250]

[P215303](#) C00822 N. face of Maol Donn, 2.4 km. S. of Corrie, Arran. False-bedding in Triassic sandstone. [NS 0150 4050]

[P215302](#) C00821 Shore at Merkland, 3.2 km. N. of Brodick, Arran. Recent platform of marine erosion in Triassic sandstone. Ridges left along lines of 'crush' where rock has been cemented by introduction of calcareous matter. [NS 0250 3850]

[P215301](#) C00820 Shore at Merkland, 3.2 km. N. of Brodick, Arran. Recent platform of marine erosion in Triassic sandstone. Ridges left along lines of 'crush' where rock has been cemented by introduction of calcareous matter. [NS 0250 3850]

[P215300](#) C00819 Shore at Merkland, 3.2 km. N. of Brodick, Arran. Recent platform of marine erosion in Triassic sandstone. Ridges left along lines of 'crush' where rock has been cemented by introduction of calcareous matter. [NS 0250 3850]

[P215299](#) C00817 Shore at Brodick Castle, 1.6 km. N. of Brodick, Arran. False-bedding in Triassic sandstone. [NS 0150 3750]

[P215298](#) C00816 Hillside, S. of Garbh Allt, 4.0 km. NW of Brodick, Arran. Folding superinduced upon cleavage planes in schistose grit. [NR 9750 3850]

[P215297](#) C00815 Hillside, S. of Garbh Allt, 4.0 km. NW of Brodick, Arran. Folding superinduced upon cleavage planes in schistose grit. [NR 9750 3850]

[P215296](#) C00814 Glen Rosa, 3.2 km. NW of Brodick, Arran. Terminal moraines truncated by stream. [NR 9850 3850]

[P215295](#) C00813 Glen Dubh (Glen Cloy), 3.2 km. SW of Brodick, Arran. Site of moraine dammed lochan drained by stream erosion. [NS 0050 3650]

[P215294](#) C00812 Glen Cloy, Brodick, Arran. False-bedding in Triassic sandstone. [NS 0050 3650]

[P215293](#) C00811 W. end of Dun Dubh, S. of Corrygills, Arran. Nearly horizontal columnar structure in quartz-porphry sill. [NS 0350 3450]

[P215292](#) C00809 Slidery Water Head, 4.8 km. SW of Lamlash, Arran. Boulder of igneous breccia. [NR 9750 2850]

[P215291](#) C00808 WW. side of Holy Island, E. coast of Arran. Cliff of columnar felsite. [NS 0550 2950]

[P215290](#) C00806 SE end of Holy Island, E. coast of Arran. Composite basalt dyke cutting Triassic sandstone. [NS 0650 2850]

[P215289](#) C00805 SE end of Holy Island, E. coast of Arran. Quartz-porphry dyke cutting Triassic sandstone (below) and dolerite (above). [NS 0650 2850]

[P002497](#) C03514 Bruce Stone, Glen Trool, Kirkcudbright. Erratic boulders arranged to form a memorial cairn. Looking south. The 'Bruce Stone' memorial was erected in 1926 to commemorate a battle of 1307. The stone is an erratic block of Loch Doon 'granite' resting on a pile of smaller erratic boulders. The memorial is built on a glaciated pavement of hornfelsed greywacke country rock. Muldonach, in distance, is also composed of hornfelsed greywacke. Granite erratics can be found widely scattered around the Loch Doon granite pluton and testify to the former glacial conditions in the

region during the Devensian. The Loch Doon granite area was the centre of a local ice cap and glaciers moved outwards onto lower ground with an approximately radial pattern of flow, carrying along rock debris as erratic blocks. [NX 4150 8050]

[P002406](#) C02877 Glen Rosa, Brodick, Arran, Bute. Valley filled with glacial debris forming alluvial flat. This is a view of the same valley as in C02876, but looking downstream to its lower reaches. The basic shape of the rock valley is still U-shaped, though less pronounced, but the floor has been modified by being filled with glacial debris washed down by the burn and now forming an alluvial flat. The stream is meandering about across the valley and can be seen, on the right, cutting into the thin wedge of boulder clay which drapes the lower slopes of the valley sides. Scotland, and indeed a large part of the northern hemisphere, has experienced several glaciations over the last 100,000+ years. This has profoundly modified the landscape, with extensive erosion of the highland areas giving rise to corries, cirques, U-shaped valleys etc. In the lowlands, there was equal, or more extensive deposition of boulder clay, moraines, erratic blocks, sand and gravel, varved clays (in glacial lakes), as well as the moulding of the landscape into drumlins, roches moutonnees etc. Sediments deposited offshore also preserve a record of the various waxing and waning phases during this period. [NR 9950 3750]

[P002405](#) C02876 Glen Rosa, Brodick, Arran, Bute. U-shaped valley. Excellent example of a U-shaped valley which has been gouged out to this shape by the action of glaciers. The slopes on either side of the valley are covered by a thin layer of soliflucted scree and soil. Of course, the burn presently occupying the valley is completely out of scale to the size of the feature. Note corries on the skyline. Scotland, and indeed a large part of the northern hemisphere, has experienced several glaciations over the last 100,000+ years. This has profoundly modified the landscape, with extensive erosion of the highland areas giving rise to corries, cirques, U-shaped valleys etc. In the lowlands, there was equal, or more extensive deposition of boulder clay, moraines, erratic blocks, sand and gravel, varved clays (in glacial lakes), as well as the moulding of the landscape into drumlins, roches moutonnees etc. Sediments deposited offshore also preserve a record of the various waxing and waning phases during this period. [NR 9950 3750]

[P002049](#) C00892 South of Dougrie, west coast of Arran, Buteshire. Fossil sea caves. Like much of the west coast of Scotland, Arran has good examples of raised beach features at various topographical levels. Here, abandoned sea caves have been excavated in a cliff of Lower Old Red Sandstone conglomerate, forming the back edge of a raised beach. The photographer is standing on the wave-cut platform associated with the raised beach. The massive nature of the conglomerate (i.e. it is not well bedded) can be clearly seen. Such sea caves are quite common along the Clyde coast and were formed when the sea level was higher than at present. This typically occurs when an ice-cap retreats, rapidly releasing large quantities of water which raises the sea level. However, through time, the land rises isostatically with the removal of the ice load, and the sea-level appears to fall again relative to the land. [NR 8950 3650]

[P002048](#) C00881 Cir Mhor, from Glen Rosa, Isle of Arran, Buteshire. Distant view of a granite mountain, looking along a glaciated valley. Glen Rosa is a typical U-shaped glaciated valley with its floor strewn with granite erratics. The burn itself is also typical of such a situation, with a steep gradient tumbling over jagged rapids and a boulder-filled bed. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9750 4350]

[P002047](#) C00879 1.0 km. east of Caisteal Abhail, head of Glen Sannox, Isle of Arran, Buteshire. Characteristic weathering of a granite mountain cut by dykes. At (I), a dyke (7.3 m. wide) cuts the granite, the upper part of which has weathered out forming the deep rift of Ceum na Caillich (the 'Witch's Stride') on the right skyline. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9750 4450]

[P002046](#) C00874 Summit of Goat Fell, Isle of Arran, Buteshire. Typical upland granite topography. Characteristic jointing in the coarser granite, causing it to break up into slabs and weather into 'tors' (isolated upright crags with deep weathering along joints, giving a somewhat rounded appearance). Arran is one of the series of Tertiary volcanic centres

grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9950 4150]

[P002045](#) C00871 Goat Fell, Isle of Arran, Buteshire. Typical upland granite topography. The summit of the Northern Granite in Arran showing characteristic weathering along the joints, giving rise to slabs and 'tors'. The latter are isolated upright crags with deep weathering along joints, giving a somewhat rounded appearance. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9950 4150]

[P002044](#) C00869 Goat Fell, Isle of Arran, Buteshire. Typical upland granite topography. The summit of the Northern Granite in Arran shows characteristic weathering along the joints, giving rise to slabs and 'tors'. The latter are isolated upright crags with deep weathering along joints, giving a somewhat rounded appearance. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9950 4150]

[P002043](#) C00863 Near foot of Gleann Easan Biorach, Loch Ranza, north-west Arran, Buteshire. Granite/Dalradian contact. Feature formed by weathering along junction between the Northern Granite and the local Dalradian. The granite is on the right and has a more massive appearance. The Dalradian schists on the left, with sub-vertical fabric, have been hornfelsed by the granite. The contact has obviously been a zone of weakness which has weathered out. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NR 9450 4950]

[P002042](#) C00862 From mouth of Glen Sannox, Isle of Arran, Buteshire. Typical granite landscape on Arran. Distant view of granite mountains, Cioch na h-Oighe (left), Cir Mhor (centre), Caisteal Abhail and Suidhe Fhearghas (right). Good example of the rugged nature of the granite terrane in the northern part of Arran. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NS 0150 4550]

[P002041](#) C00861 From mouth of Glen Sannox, Isle of Arran, Buteshire. Typical granite landscape. Distant view of granite mountains, Cioch na h-Oighe (left), Cir Mhor (centre), Caisteal Abhail and Suidhe Fhearghas (right). Good example of the rugged nature of the granite terrane in the northern part of Arran. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NS 0150 4550]

[P002040](#) C00837 The 'Fallen Rocks', near Millstone Point, 6.4 km. north-north-west of Corrie, Isle of Arran, Buteshire. Landslip of Upper Old Red Sandstone conglomerate blocks. Looking south. The 'Fallen Rocks', near Millstone Point, 6.4 km. north-north-west of Corrie, Isle of Arran, Buteshire. Landslip of Upper Old Red Sandstone conglomerate blocks. Looking south. The east coast of Arran north of Glen Sannox is quite steep, leading to areas of landslip. Here, large masses of Upper Old Red Sandstone conglomerate and sandstone have fallen from the cliffs and covered the rocks along the coast. The basal beds of the Carboniferous (faulted contact) occur just north of this locality. Much of the so-called Upper Old Red Sandstone is now considered to be early Carboniferous in age. [NS 0050 4850]

[P002039](#) C00818 Shore at Merkland, 2.8 km. north of Brodick, Isle of Arran, Buteshire. Perched block on shore. Looking south. The Permo-Triassic sandstones of Arran are relatively soft and easily eroded by the sea. In this instance, the sandstone underlying this large block on the modern wave-cut platform has been removed by marine erosion, leaving the boulder as a 'perched block' resting on slightly harder rocks. Permo-Triassic rocks are relatively uncommon onshore in

Scotland but are well represented offshore. Those on Arran lie towards the northern margin of a large Permo-Trias filled basin in the Firth of Clyde. [NS 0250 3850]

[P002038](#) C00807 South end of Holy Island, east coast of Arran, Buteshire. Columnar-jointed sill or sheet. This thick sill or sheet of columnar-jointed riebeckite-trachyte rock overlies (intrudes) Permian sandstone, the latter being concealed under drift. This large intrusion covers a significant proportion of Holy Island. Arran is one of the series of Tertiary volcanic centres grouped along the west coast of Scotland and relates to a period of crustal extension between 55 and 61 million years ago. Similar aged lavas and intrusions in the Faeroes and East Greenland were all once part of the same Tertiary igneous province, before being separated by the opening of the Atlantic Ocean. [NS 0650 2850]

[P000353](#) C00825 South of Corrie, Arran. An erratic, a granite boulder ice-transported eastwards from the main Northern Granite mass during the last glaciation. Erratics are a characteristic feature of glaciated regions and are common on Arran. South of Corrie, Arran. An erratic, a granite boulder ice-transported eastwards from the main Northern Granite mass during the last glaciation. Erratics are a characteristic feature of glaciated regions and are common on Arran. While the source of this erratic was from the west the general trend of movement of erratics on Arran is southwards; they were prevented from moving any appreciable distance east or west by the pressure of ice sheets which filled Kilbrennan Sound and the Firth of Clyde. Notable occurrences of Northern Granite erratics on Arran are the north shore of Whiting Bay, Glenashdale region, the hillside south of Largymeanoch 1000 yards east of Cnoc na Comhairle and on the scarp of the Dippin crinanite near Dippin. [NS 0250 4250]

[P000352](#) C00824 South of Corrie, Arran. An erratic, a granite boulder ice-transported eastwards from the main Northern Granite mass during the last glaciation. Erratics are a characteristic feature of glaciated regions and are common on Arran. South of Corrie, Arran. An erratic, a granite boulder ice-transported eastwards from the main Northern Granite mass during the last glaciation. Erratics are a characteristic feature of glaciated regions and are common on Arran. Most of the erratic boulders and blocks of Arran are of local origin, a phenomenon thought to be due to the protecting influence of the local ice-cap. It is estimated that these large erratics can be up to 400 tons in weight. [NS 0250 4250]

[P000351](#) C00810 Shore at Corrygills Point, about 3.2 km. east of Brodick, Arran. The erratic rests on a low raised beach, an old cliff line is seen to the left. The scale is indicated by the girl standing next to it. In many coastal areas where there are concentrations of erratics they have been derived from the erosion of the boulder clay in which they have been transported. An erratic, a granite boulder carried eastward from the main Northern Granite mass during the last glaciation. Erratics are a characteristic feature of glaciated regions and are common on Arran. [NS 0450 3550]