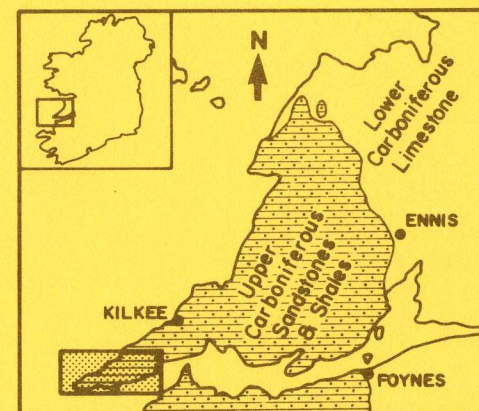


THE GEOLOGY OF LOOP HEAD, CO. CLARE.

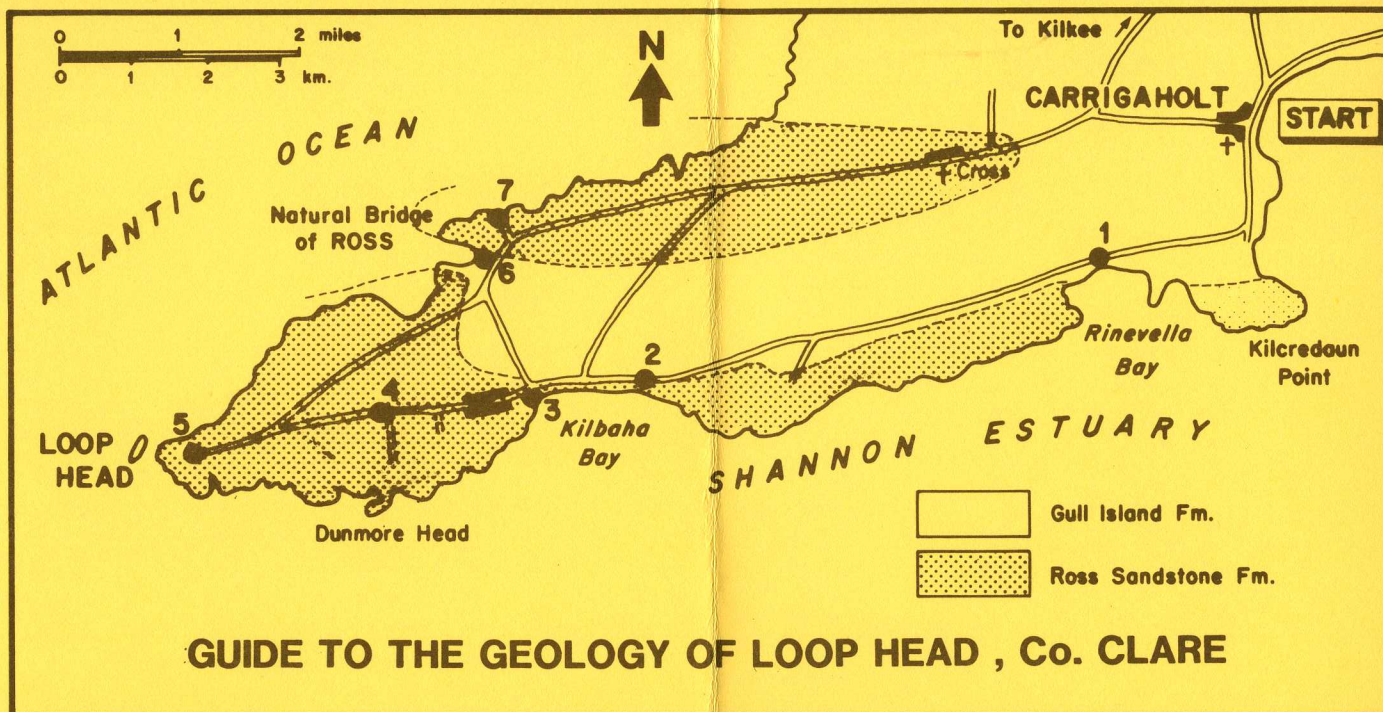
by G. C. Lewarne Sheehan



START: CARRIGAHOLT Grid Ref. Q843520 on Ordnance Survey Half Inch to One Mile (1:126720) Map No. 17 (Shannon Estuary).

TIME: Allow 2½ hours travelling by car, from Carrigaholt to Ross. Allow extra time for a picnic, and travelling time from Ross to Kilkee (½ hour), or from Ross to Carrigaholt (¼ hour).

NOTE: Binoculars will be useful.



START:

CARRIGAHOLT VILLAGE: QUAYSIDE T-JUNCTION at Q843520. Travel south along the 3rd-class road. Ahead is Kilcredaun Point, where there are two ancient churches and a Napoleonic "Battery" dated 1814. At the turning for Eugene O' Curry College (0.9 miles/1.45km) the main road turns right.

STOP 1. (at 1.9 miles/3.06km) **RINEVELLA BAY** Q828498. Park at the side of the bay where the road runs alongside the storm beach.

The massive resistant Ross Sandstones of Kilcredaun Point and Rehy Hill contrast with the lowland area on which you are standing. Note the storm beach of large cobbles up to 20cm of local grey or buff sandstone, and brown or red Devonian sandstone derived from other areas. Inland of the storm beach lies a flat peaty area of impeded drainage. Walk east along the storm beach, noting the bedded sandstones on the foreshore. Look across the headland to the bay to the east. If conditions permit, a peat bed can be seen below the storm beach there, with a "fossil forest" of tree stumps now below the high water mark. The sea level must have risen in the estuary since the trees grew in the aftermath of the Ice Age (Quaternary Period).

STOP 2. (at 6.7 miles/10.78 km) **KILTRELLIG** Q755482. Park where the road meets the coast before the small bridge. Note the bedded Ross Sandstones on the foreshore with ripple-marked surfaces. Look westwards across Kilbaha Bay to the Lookout Tower.

The rocks are folded into an anticline, the crest of which lies under the Tower. They dip gently on the north limb, but very steeply southwards on the south limb. Note the cave eroded into the fold axis where the rocks are strained and weakened.

STOP 3. (at 8.1 miles/13.03km) **KILBAHA QUAYSIDE** Q735482. Park at the Quay. This is a suitable place for a picnic. Continue westwards past the houses.

STOP 4. (at 9.5 miles/15.29km) at crest of the rise in the road. Park carefully at the entrance to the unmetalled lane on the left (the 2nd turn left since leaving the Quay) at Q719477.

Walk half a mile southwards to the hill-crest to view Dunmore Head (HORSE ISLAND) at Q719465.

NOTE: Access to the Island is **PRIVATE**

The rocks of the Island are folded into a box-fold. The sandstones on the Island dip very steeply northwards towards you. On the floor of the bay they are horizontal, and on the mainland they dip steeply southwards away from you. The bedding planes are ripple-marked, proving that they were once on the horizontal seabed. The Island is linked to the mainland by a ridge of boulder clay. Across the estuary note Kerry Head in the middle distance. The mountains of the Dingle Peninsula may be seen in the far distance with Mount Brandon on the skyline. These mountains are composed of Old Red (Devonian) Sandstones.

STOP 5. (at 11.3 miles/18.18 km) **LOOP HEAD LIGHTHOUSE** Q690471. Park in the space provided near the main gate.

Walk around the right-hand corner of the wall and across the sward to the Head. Look back to view the cliffs to the north where the rocks are spectacularly folded. At the end of the headland note Dermot and Grania's Rock, a large sea stack, separated from the mainland by Cuchallin's Leap. The Leap represents a fault line. The shattered and weakened rock has been eroded by the sea.

STOP 6. (at 14.7 miles/23.65km) **MONEEN** Q732498. Park where the road meets the coastline.

Note the storm beach with cobbles of sandstone veined with white quartz. Reefs of siltstone rock are bedded perpendicularly to the coastline.

Drive on past the first group of houses and immediately turn left into the land leading to the coast (not marked on map) (at 14.9 miles/23.97km).

STOP 7. NATURAL BRIDGE OF ROSS Q730505. Park in the car park provided at the head of the bay.

Walk along the cliffpath westwards. Note the inlet with the puffinghole. The storm waves have been channelled along the inlet and into the narrow cave under your feet, and have undermined and eventually blown out the top of the cave, which has fallen in to form a funnel-shaped depression through which spray and spume may be thrown high into the air.

Cross the field to the sign-post. Note the inlet to the west with the natural arch at its head. To your right a chaotic sheet of slumped and churned siltstones, the Ross Slide, overlies the bridge formed by a 30ft anticline in bedded sandstones which has been undermined by the sea.

Walk on to the Natural Bridge itself. The former puffing-hole beyond has been enlarged by marine erosion into an amphitheatre.

Walk to the edge of the grass. At the base of the Ross Slide a layer of black shale can be seen, which acted as a slippery sole layer on which the unstable slits slumped and crumpled. Look above the slide, where flaggy parallel-bedded sandstones represent the restoration of quiescent conditions.

Return to the car park, noting in various places other 'bridges' in stages of formation. Arriving back at the bay note that the bedrock is overlain in the cliffs by a thickness of boulder clay which is dark in the lower half due to included fragments of shale rock.

You may drive to Kilkee via Cross, Q794508, and the sign-posted coast road (a distance of 13 miles/20.92km), or return to Carrigaholt via Cross, turning right at the Y-junction Q817517 (a distance of 7.6 miles/12.23km).

THE GEOLOGY OF LOOP HEAD, CO. CLARE.

The west coast of Co. Clare is of considerable geological interest. The rocks of the Loop Head area are sandstones of sedimentary origin, i.e. they were piled up as layers of sediment on the floor of an ancient sea. They are of Upper Carboniferous age and correspond to the "Millstone Grit" of Britain, and its equivalent in Belgium and Germany.

The clear subtropical sea in which the Carboniferous Limestone of central Ireland had been deposited was invaded by vast quantities of sand and silt derived from a land-mass to the north-west, where the Atlantic is now. In south-west Clare the layers of fine-grained sediment which settled from the silt-laden currents eventually consolidated into the parallel-bedded sandstones and fine siltstones (turbidites) which underlie the Loop Head area today. Black shales at the base of certain siltstone units sometimes contain goniatites (fossils related to modern cuttlefish), which correlate with more extensive developments of shale above the limestone of east Co. Clare. The sandstones of Loop Head do not themselves contain fossils, but there is ample evidence to show that they are of marine origin, such as burrows and trails of marine organisms (similar to those preserved in the Liscannor Flags of the Cliffs of Moher). Bedding surfaces are often covered with ripple marks (as seen on sandy shorelines today), and by markings and flutings caused by the scouring of the then soft sand by water currents.

Contemporary earthquake shocks sometimes caused the water-logged silt to slump and slide. The structures of these slumped layers are still preserved in solid rock, contrasting markedly with the parallel-bedded strata of sandstone which accumulated under quiet conditions.

The rocks of Loop Head have been divided into the lower (older) Ross Sandstone Formation and the upper (younger) Gull Island Formation, which is more silty and more extensively slumped. The rocks are often folded very steeply into anticlines and synclines with nearly vertical limbs, a tectonic style known as "box-folding". On the cliff tops the solid bedrock is covered by a blanket of boulder clay left by a melting ice-sheet at the end of the Quaternary Period. Locally both bedrock and boulder clay were disturbed by freeze-thaw action under the sub-arctic permafrost conditions. When the climate became warmer the clay was colonised by bog mosses, and, eventually, trees. The melting of the ice-sheet caused a local rise in sea-level, and the trees are now seen as "fossil forest" peats below the high water mark of certain bays of the estuary.

Loop Head is noted for its extensive coastal views and spectacular rock formations.

GEOLOGICAL HISTORY OF IRELAND

Ages are quoted in millions of years (my). Permian to Tertiary rocks are restricted to northeast Ireland, but also occur widely offshore.

ERA	PERIODS	AGE	IRISH ROCKS AND THEIR ENVIRONMENTS OF DEPOSITION	TECTONIC & IGNEOUS EVENTS
CENOZOIC	QUATERNARY	2	Superficial soils. Peat. Boulder clay & fluvioglacial gravel.	
	TERTIARY	65	Non-marine (Lough Neagh) clays.	Basalt flows, dykes & granites in north east Ireland.
MESOZOIC	CRETACEOUS	135	Chalk & shallow water marine & non-marine sandstone & mudstone.	
	JURASSIC	190	Marine & non-marine shale & sandstone.	
	TRIASSIC	225	Red, non-marine sandstone, marl & evaporite.	
	PERMIAN	290	Red, non-marine sandstone & marl. Marine dolomite.	Hercynian folding & faulting.
PALAEOZOIC	CARBONIFEROUS	345	Sandstone, shale & coal formed in coastal swamps. Shallow water, marine limestone.	Volcanism
	DEVONIAN	395	Red, non-marine conglomerate, sandstone & siltstone.	Late Caledonian folding, faulting & granites.
	SILURIAN	435	Marine sandstone & mudstone, some of deep-water origin.	
	ORDOVICIAN	500	Deep & shallow water marine sandstone, mudstone & limestone.	Volcanism
	CAMBRIAN	570	Marine, mainly deep-water quartzite & mudstone.	Early Caledonian metamorphism, folding & granites.
PRE-CAMBRIAN ERAS			Quartzite, schist, gneiss & marble.	Pre-Caledonian metamorphism, folding & granites.

Origin of the earth ca. 4600 my

A RESPONSIBILITY

The user of this guide is strongly urged to take every care of the countryside and particularly areas described in this guide. Specimens should be collected with great care and only if they are going to have some continuing interest. Use a camera or a sketch-pad instead of a hammer and please leave all gates fastened, leave no litter and avoid damage to fences and hedges.

AN INVITATION

If you have enjoyed using this guide you may be interested to know that the Irish Geological Association organises many field excursions and lectures for its members every year. Many of these prove of interest to amateur geologists. Information about these events can be had by writing to the Association, care of any University Geology Department or to the Geological Survey of Ireland, Beggars Bush, Haddington Road, Dublin 4.