IRISH GEOLOGICAL ASSOCIATION

FIELD GUIDE SERIES
No. 5

# THE GEOLOGY OF NORTH TIPPERARY

By T. M. Brück

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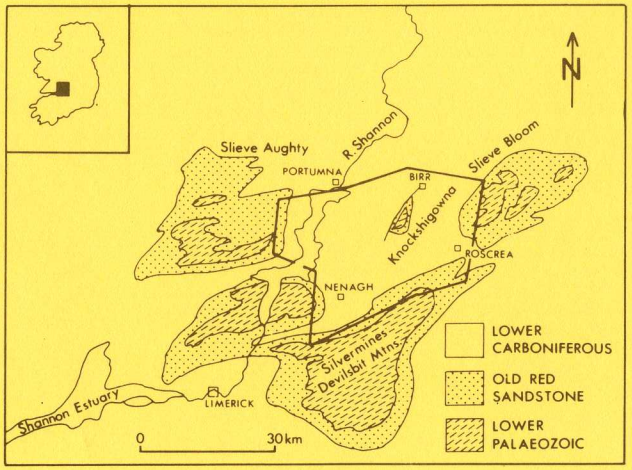


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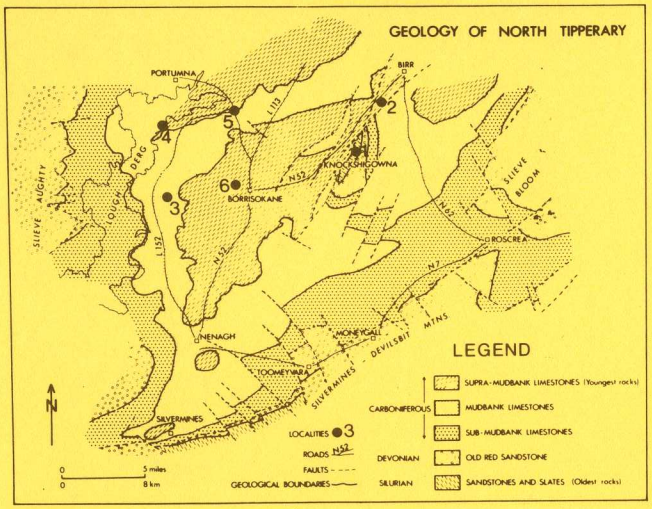
START: Pike cross-roads Grid Ref. R 995949 on Ordnance Survey Half Inch to one Mile (1:126720) Map. No. 15




**INTRODUCTION**

The itinerary is followed by car and totals 30 miles/50km. It can be completed in a day. The route commences in the oldest (Silurian) rocks and terminates in the youngest (Carboniferous) rocks. Some glacial and post-glacial features are noted. The scenic area of Lough Derg can be visited. Use Half Inch Ordnance Survey Map 15; National Grid references are given. Although the stops are on private lands, no difficulty should be experienced in access. However, larger groups are advised to seek permission from the landowners. Read reverse of leaflet before commencing excursion.

**START**

**STOP 1.** (The excursion commences along the northern flanks of Knockshigowna. From The Pike crossroads at R 995949, turn north and take second right up Knockshigowna. Park 0.3 miles/0.5km along road from turn-off at S 016970).

Greenish-grey sandstones and slates of Silurian age (see Figure on reverse of leaflet) are exposed in the fields adjacent to the road. The original horizontal layers of sand (now sandstone) and mud (now slate) are separated by bedding planes which are steeply inclined due to the Caledonian fold episode (see reverse of leaflet). Drive along the road for another 0.4 miles/0.6km and park. Yellowish sandstones of Devonian age can be seen in the fields on the left (NW) side of the road and are termed Old Red Sandstone; in them the bedding planes, separating coarser and finer sandy layers, are nearly horizontal. These sandstones were deposited after the Caledonian fold episode and they lie on top of the tilted Silurian greenish-grey sandstones and slates.

If time permits walk to the summit of Knockshigowna. To do this drive south 0.3 miles/0.5km to T-junction and turn right. Drive 0.4 miles/0.6km to the west and park at road junction to south. Walk 0.5 miles/0.8km through two fields to summit. En route to the summit, outcrops of rock having the appearance of consolidated gravel will be seen. Such a rock is termed a conglomerate. Here it contains rounded pebbles of hard white quartz, greenish-grey chert, and dark red jasper, all of which are related silica minerals. The view from the summit shows how Knockshigowna, being composed of hard sandstones and slates (with some conglomerate) stands out in relief with respect to the more readily weathered surrounding Carboniferous limestones which are younger than the rocks of the hill and which would have at one time extended over it but have now been weathered away.

**STOP 2.** (Drive west to the straight road extending northwards along western edge of Knockshigowna - see Half Inch Map - and turn north. 2.4 miles/3.8km north of Lougheen, park where small road branches to left (N 040022); this road joins the N52 from Birr to Borrisokane).

A conspicuous Esker occurs here on the eastern side of the road. In appearance it is like a railway embankment, about 5 metres high, and is composed of sands and gravels deposited in a river formed under ice during the Ice Age.

Turn left onto small road across to N 52 and drive south. As from about 2 miles/3km south down N52 several broad ridges are crossed; these are composed of gravel deposited as moraine at the edge of melting ice.

**STOP 3.** (Drive south for approximately 7 miles/11km on N52 to Borrisokane and then to Newchapel at R 849927). Note areas of hazel scrub en route; hazel grows particularly well on the 'Mudbank Limestone'. Take first turn right 0.7 miles/1km west of Newchapel and park beside deserted cottage 0.1 miles/0.2km on left. Walk 50 metres north down road to gateway on right, a short distance along track to rocky knoll on right at R 833936).

This locality is in the Mudbank Limestone belt of Carboniferous age which forms the Kilbarron Hills along the eastern side of Lough Derg. The limestone here is very fine grained and grey in colour. At the base of the crags pale grey, horizontally bedded limestones are present with thin irregular bands and nodules of hard, grey splintery chert.

Climb to the top of the crags and look at the view. Note that the hills have mainly steep rocky crags facing northwest and gentler slopes underlain by boulder clay, deposited during the Ice Age, facing southeast. They are thus typical 'crag and tail structures' reflecting movement of ice during the Ice Age from the northwest to the southeast. The small bog, with lakes, at the northern foot of the hill, developed during a warm period after the Ice Age.

**STOP 4.** (Proceed to Coolbaun - see Half Inch Map. If time permits drive west to Lough Derg for picturesque views. Drive north along L152 to Ballinderry. At cross roads 0.1 mile/0.2km north of Ballinderry turn left (NW) and proceed for 0.9 miles/1.4km. Park at gate on left of road at right-hand bend at R 845995. Distance from Stop 2 is about 7 miles/11km. Walk through field 500 metres to lake shore).

The first rocks encountered are fine grained pale grey limestones - part of the Mudbank Limestone as seen at Stop 2. Walk north a few yards along lake shore and a slabby, even grained pale grey limestone is seen, crystalline in appearance. Note that the bedding is virtually horizontal. This is one of the Supra-Mudbank Limestones (see reverse of leaflet) and it rests on the Mudbank Limestone.

The rock type here is similar to that of the Burren and this is reflected in a local exotic flora. Walk north along shore for 450 yards, crossing a wall and a fence. 250 yards past fence in scrub at right hand edge of field a small cliff exposes limestones and shales (part of the Supra-Mudbank Limestones) which overlie and are therefore younger than the crystalline limestones.

An important feature to note here is that the lake shore cuts across three different limestone types. This is because Lough Derg is a solution lake, having been formed by solution of the limestones by the River Shannon. At its southern end, between Portroe and Killaloe, the lake is narrower because more resistant sandstones and slates occur there, similar to those of Knockshigowna.

**STOP 5.** (Drive northwards via Terryglass and L152 to Carrigahorig, about 4 miles/6.5km. If time permits visit the ruins of Oldcourt Castle (13th century, signposted, on left, north side of road), between Stop 4 and Terryglass, and also detour to the lake shore at Terryglass. At Carrigahorig park beside Waterfall Bar at M 905002 and cross wall behind bar to quarry in field.

Fine grained, pale grey, Mudbank Limestone is seen here with the bedding inclined to the northwest. Fossils are common, particularly small round plates, about 0.5cm across, representing the disarticulated remains of submarine animals called crinoids.

**STOP 6.** (Turn south on N52 towards Borrisokane and Nenagh. At north end of Borrisokane turn right towards Ballinderry and at first cross-roads take road to right and park in quarry entrance on right at R 90148, 250 metres from cross roads. Distance from Stop 5 is about 7 miles/11km).

The quarry exposes some of the youngest rocks of the area, part of the Supra-Mudbank Limestones. The rocks are limestones with a coarse granular appearance. A well developed, more or less horizontal bedding, is present. The limestones are traversed by occasional thin veins of the soft white mineral calcite, which is calcium carbonate which has been derived from the limestones by solution and subsequent precipitation along cracks.

## THE GEOLOGY OF NORTH TIPPERARY

The oldest rocks of North Tipperary are green-grey slates and sandstones of Silurian age (see adjacent Geological History of Ireland and Map inside leaflet) which form the central parts of Slieve Aughty, Slieve Bloom, the Silvermines-Devilsbit Mountains and Knockshigowna. The outer parts of these hills are composed of younger, yellowish and red sandstones of Devonian age, termed the Old Red Sandstone. Surrounding those hills, in which the rocks are relatively resistant to weathering, are younger limestones, of Carboniferous age which dominate the lower ground of the district.

The Silurian rocks were deposited as layers of muds and sands in an ancient sea and were subsequently folded and altered to form slates and sandstones during the Late Caledonian folding episode (see adjacent Geological History).

During Devonian times the seas retreated and rivers developed in which the sandstones of the Old Red Sandstone were deposited. These sandstones contain layers of pebbles which represent river gravels.

During early Carboniferous times, warm, lime-rich seas extended northwards from the south to cover much of Ireland. Abundant marine life was present and is now preserved as fossils. In the North Tipperary area different varieties of limestones were laid down as time progressed, commencing with well layered, muddy, Sub-Mudbank Limestones (see Map). Subsequently submarine banks of fine grained and sometimes fossiliferous carbonate mud acumulated to form the Mudbank Limestone which makes up the Kilbarron Hills along the eastern side of Lough Derg. Later various limestones, generally much coarser than the Mudbank Limestone accumulated and are grouped as the Supra-Mudbank Limestones.

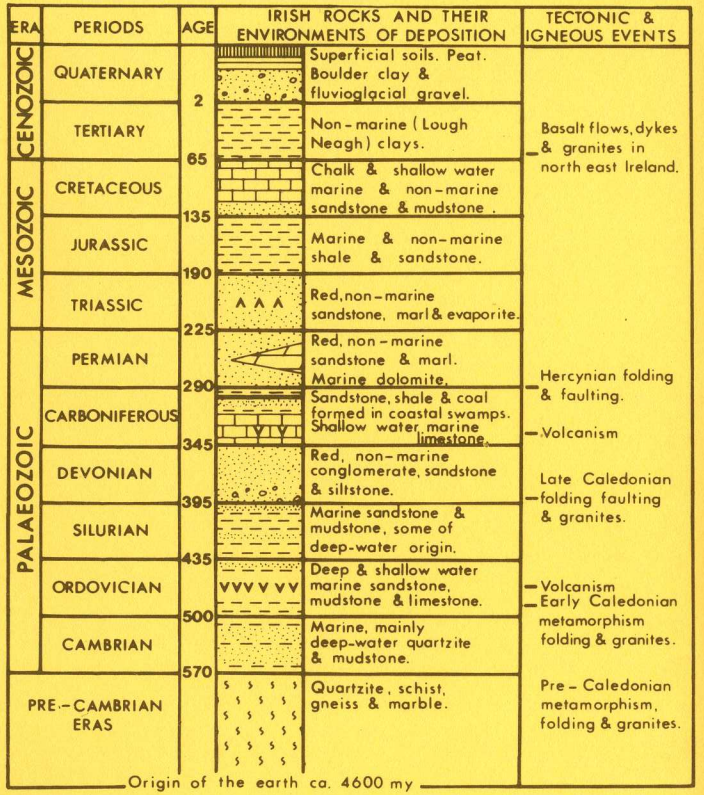
Lead, zinc, and barium sulphate were introduced during Carboniferous times into the limestones and sandstones of the Silvermines region, near Nenagh. The barium sulphate (barytes) is quarried at Ballynoe near Silvermines. Extensive fractures termed 'faults' developed at this time (see Map).

During the early part of the Quaternary Period, ice spread over central Ireland, including North Tipperary, from the northwest and deposited boulder clay. Extensive sand and gravel deposits accumulated in temporary lakes, for example around Birr and Roscrea, and also as eskers which are deposits formed in rivers which flowed under the ice.

In later Quaternary times marls accumulated in temporary lakes and this was followed by the development of peat bogs principally on these lake sites so that whitish marls are often found under the peat.

## 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.




## 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 and a sketch pad instead of a hammer and please leave all the 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.