

The Pleistocene Period in Ireland.

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A summary of a lecture given at the Dansk Geologisk Forening, Copenhagen, on December 4, 1950. This outline of the events of the Pleistocene period in Ireland must be regarded as an account of a working-hypothesis, and not as a recital of facts which are proved in every detail (cfr. M.D.G.F, bind 11, hefte 5, p. 611).

No undisturbed Pliocene deposits are known in Ireland, and little is known of the early stages of the Pleistocene period. Professor JESSEN is examining a deposit of mud which lies below glacial deposits at Gort, Co. Galway and contains remains of *Abies*, *Picea*, *Rhododendron ponticum* etc. (JESSEN, 1948). The deposit cannot be younger than the Mindel/Riss interglacial and may be still older.

Along the south coast a well-defined rock-platform is seen in many places, and at some localities it is covered by typical beach deposits. The deposits do contain erratic boulders (apparently derived from the north-east) but are unfossiliferous. The deposits lie about 4 m. above the modern beach deposits (WRIGHT & MUFF, 1904). As the glacial deposits which rest on the beach are Riss in age, the beach must belong to the Mindel/Riss or Great Interglacial period. The low level of the beach should be noted. An interglacial deposit at Kilbeg, Co. Waterford (MITCHELL, 1948), which contains remains of *Abies*, etc., may also belong to this interglacial period.

At one locality on the south coast, Nemestown, Co. Wexford (COLE & HALLISSY, 1941), the Riss deposits do not rest on a rock platform or beach, but on a curious deposit, very much weathered but apparently of glacial origin. This may be the remains of a glacial deposit of Mindel age, which could be a source for the erratics in the beach.

In eastern Ireland it may be possible to establish three stages of the Riss glaciation. In the first stage ice descended from the mountains of eastern Ireland (Enniskerry Mountain Glaciation, FARRINGTON, 1944), in the second an enormous ice-sheet stretched down from the mountains of the north of Ireland and of Scotland (Eastern General Glaciation), in the third local ice became powerful again and another ice-sheet extended out from the mountains of eastern Ireland (Brittas Mountain Glaciation). The first stage has only been recognised at Enniskerry, Co. Wicklow. In the second the Scottish ice streamed down the bed of the Irish Sea, and deposited a boulder clay with shells and Scottish erratics along the east

and part of the south coast of Ireland. In the third stage a sandy deposit with much local rock was deposited on top of the shelly drift in south-east Ireland.

On one sector of the south coast also the shelly boulder clay is covered by material of more local origin, and striae show that this local ice came from the mountains of south-west Ireland. This Greater Kerry/Cork Glaciation (FARRINGTON, 1947) may be contemporaneous with the Brittas Mountain Glaciation. Even if the advance of the local ice was earlier, and contemporaneous with the maximum advance of the Eastern General Glaciation, the ice-masses can only have coalesced in two limited areas. Elsewhere an ice-free strip of land separated the two ice-sheets. Dr. FARRINGTON is of the opinion that certain areas in the south of Ireland were not covered by ice at any stage of the Pleistocene period.

Though frost-structures (polygonboden, eiskeilen etc.) are almost unknown in Ireland, the Riss deposits are often covered by a heavy mantle of fliesserde. The deposits are deeply weathered and have had their topography much smoothed; some of the smoothing is due to solifluction during the Würm glaciation. At Ardcavan, Co. Wexford (MITCHELL, 1948) a small kettle-hole in the moraine of the Brittas Mountain Glaciation contained at the base a clay with remains of *Betula nana* and *Salix herbacea*. A much altered organic mud, rich in tree pollen, rested on the clay. The mud was buried by frost-moved material, and all trace of the original hollow had been obliterated. The site lay only 5 km. south of the Southern Irish End-Moraine (CHARLESWORTH, 1928), which marks the limit of the Midland General Glaciation which is broadly equivalent to the Würm glaciation. At Ardcavan the smoothing of the Riss moraine, and the burial of the interglacial deposit must be due to solifluction contemporaneous with the Würm glaciation.

Within the area of the Würm glaciation wonderful examples of some of the features of young morainic topography can be seen, kettle-moraines, eskers (SYNGE, 1950), and drumlins (CHARLESWORTH, 1939). Other features, e.g. tunnel-valleys, sand-plains, are not seen at all. In some parts of Ireland large moraines must indicate at least a slowing-up of the rate of ice-retreat, and attempts have been made to recognise a series of halts or re-advances (see CHARLESWORTH, 1939, MOVIUS, 1942). No inter-stadial deposits have been found, and at present it seems safer to regard the Würm retreat as an essentially uninterrupted one. No deposits have been found around the mountains of eastern or of south-western Ireland which would suggest that these mountains carried local ice-caps during the Würm glaciation.

During the Würm retreat an Older *Salix herbacea* Clay (= Older *Dryas* Clay) (JESSEN, 1949) was laid down in many lake-basins, and when the ice disappeared altogether the Allerød stage began. There is no evidence for a cold oscillation comparable to the Bølling oscillation (IVERSEN, 1942). During the Allerød stage *Cervus giganteus* was very common in Ireland (MITCHELL & PARKES, 1949), and some relatively southern plants were in the country. Climate then deteriorated again, and small icecaps formed on the mountains of eastern (Athdown Mountain Glaciation) and of south-

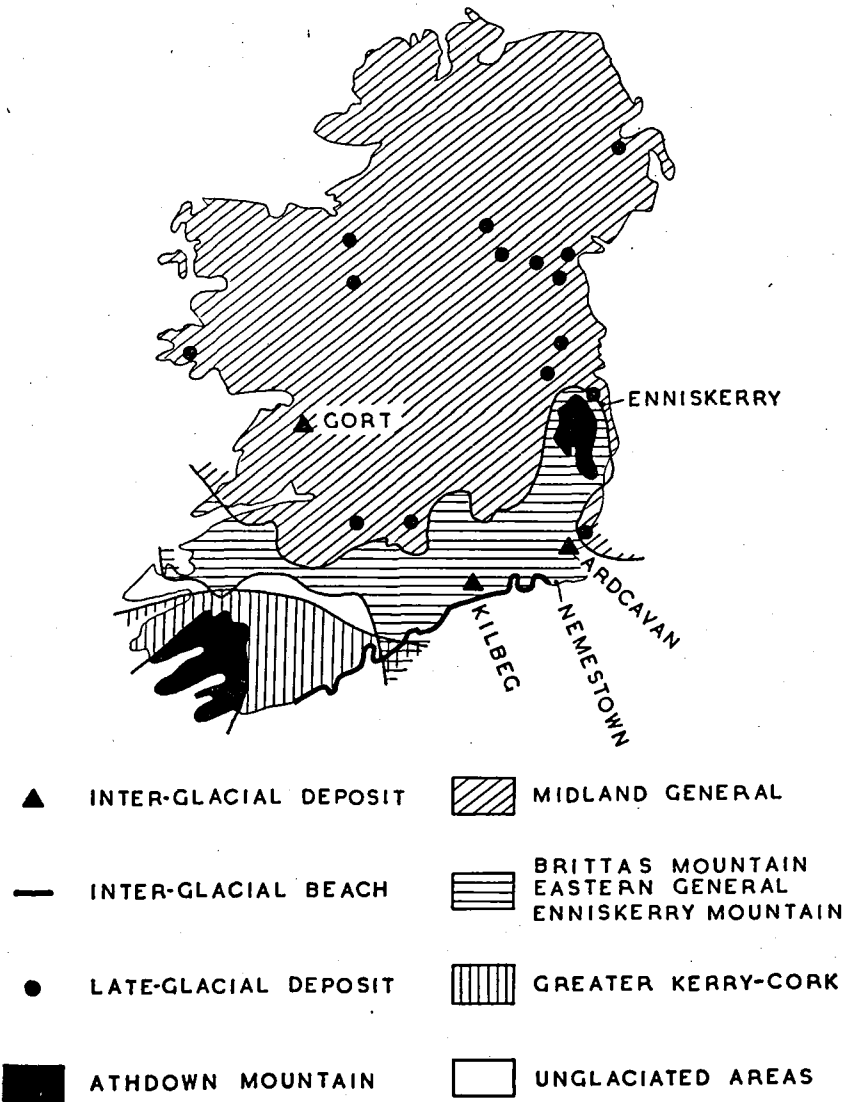


Fig. 1. Map showing extent of glaciations in Ireland.

western Ireland (Lesser Kerry/Cork Glaciation). Corries in other mountain groups became at least partly filled with ice, while on the lowlands frost action was active. From the slopes surrounding the lake-basins an Upper *Salix herbacea* Clay (= Upper *Dryas* Clay) moved down to bury the temperate mud of the Allerød stage. When these cold conditions disappeared, the post-glacial period began.

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