

# The 1992 Farrington Lecture: Drumlin Bedforms and Related Ice-Marginal Depositional Systems in Ireland

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## Abstract

The Irish drumlin belt comprises a wide morphological range of subglacial bedforms which are best developed in lowland zones located mainly in northern and western sectors of the island. Stratigraphic evidence suggests that drumlinisation occurred around 17ka B.P. in response to fast ice flow from major centres of inland ice dispersion onto the continental shelf. Well-defined moraines and morainal banks bordering the drumlin fields indicate that drumlinisation was accompanied by a high basal debris flux to ice sheet margins which was resedimented in a variety of subaqueous settings. Field observations indicate that the fast ice flow responsible for streamlining and sediment moulding was closely associated with intense marine drawdown, a decrease in basal effective pressures and a general lowering of ice sheet profiles during deglaciation. Deglacial mechanisms of this type help to explain the very rapid termination of the last glacial cycle because drawdown ice-stream drainage basins must expand in area if pulling power lowers the surface faster than ice supply raises it. Sedimentary and structural variability within drumlins indicate that drumlin formation reflects not only a highly dynamic subglacial system but, in some cases, can be related to ice sheet history. The seven main facies associations which have been identified provide a window into a variety of depositional settings which contributed to drumlin formation and drumlinisation. They confirm that drumlins are not simple landforms but have a complex history related to changing glaciological states and ice sheet evolution. The final drumlin forms however are the result of a highly mobile flux of basal debris and meltwater directed subglacially towards ice sheet margins.