

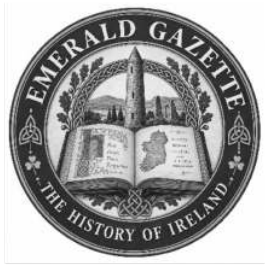
Emerald Gazette

Ireland 31300–31201 BCE

31300–31201 BCE

Issue 008 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



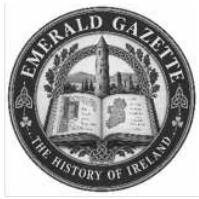
Emerald Gazette

Ireland 31300–31201 BCE

31300–31201 BCE

Issue 008 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



Emerald Gazette
Ireland 31300–31201 BCE
31300–31201 BCE
Issue 008 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA
Gerard J. Hannan BA MBS MA

Copyright © Gerard J. Hannan. All rights reserved.

First Edition
Published 2026
Emerald Gazette

Sources and references for the articles in this issue are available through Emerald Archives.

Historical interpretation may vary as new evidence emerges and scholarship develops. Emerald Gazette presents historical material in good faith, based on the sources and research available at the time of publication.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without prior permission, except for brief quotations used for review, research, scholarship or citation.

Contents

31300 BCE 2976
31299 BCE 2980
31298 BCE 2983
31297 BCE 2987
31296 BCE 2991
31295 BCE 2995
31294 BCE 2999
31293 BCE 3003
31292 BCE 3007
31291 BCE 3011
31290 BCE 3015
31289 BCE 3019
31288 BCE 3023
31287 BCE 3027
31286 BCE 3031
31285 BCE 3035
31284 BCE 3039
31283 BCE 3043
31282 BCE 3047
31281 BCE 3051
31280 BCE 3055
31279 BCE 3059
31278 BCE 3063
31277 BCE 3067
31276 BCE 3071
31275 BCE 3075
31274 BCE 3079
31273 BCE 3083
31272 BCE 3087
31271 BCE 3091
31270 BCE 3095
31269 BCE 3099
31268 BCE 3103
31267 BCE 3107
31266 BCE 3111
31265 BCE 3115
31264 BCE 3119
31263 BCE 3123
31262 BCE 3127
31261 BCE 3131
31260 BCE 3135
31259 BCE 3139
31258 BCE 3143
31257 BCE 3147
31256 BCE 3151
31255 BCE 3155
31254 BCE 3159
31253 BCE 3163
31252 BCE 3167
31251 BCE 3171
31250 BCE 3175
31249 BCE 3179
31248 BCE 3183
31247 BCE 3187
31246 BCE 3191
31245 BCE 3195
31244 BCE 3199
31243 BCE 3203
31242 BCE 3207
31241 BCE 3210
31240 BCE 3214
31239 BCE 3218
31238 BCE 3222
31237 BCE 3226
31236 BCE 3230
31235 BCE 3234
31234 BCE 3238
31233 BCE 3242
31232 BCE 3245
31231 BCE 3249
31230 BCE 3253
31229 BCE 3257
31228 BCE 3261
31227 BCE 3265
31226 BCE 3269
31225 BCE 3273
31224 BCE 3277
31223 BCE 3281

31222 BCE 3285
31221 BCE 3289
31220 BCE 3293
31219 BCE 3297
31218 BCE 3301
31217 BCE 3305
31216 BCE 3309
31215 BCE 3313
31214 BCE 3317
31213 BCE 3321
31212 BCE 3325
31211 BCE 3329
31210 BCE 3332
31209 BCE 3336
31208 BCE 3340
31207 BCE 3344
31206 BCE 3348
31205 BCE 3352
31204 BCE 3356
31203 BCE 3360
31202 BCE 3364
31201 BCE 3368

Introduction

Ireland’s history is a long and layered story shaped by people, place, belief, conflict, migration, creativity and change. Across thousands of years, successive generations have left their mark upon the island, creating a historical landscape in which ancient traditions coexist with moments of dramatic transformation. Emerald Gazette was created to explore that story in an accessible, engaging and carefully structured form, allowing readers to move through Ireland’s past one period at a time while retaining a sense of the much larger historical journey.

Each issue forms part of a continuing chronological series designed to bring together significant events, personalities, communities and developments from across Irish history. Political change and military conflict are important parts of that story, but they are only part of it. Ireland’s history can also be discovered through the lives of ordinary people, the growth of towns and settlements, religious belief, agriculture, trade, education, language, literature, music, folklore, industry, migration and the countless social changes that shaped everyday experience.

The purpose of Emerald Gazette is therefore not simply to present a sequence of dates or isolated historical events. It is to provide context. Events rarely occur independently of what came before them, and their consequences frequently continue long after the people directly involved have disappeared from the historical record. By following the series chronologically, readers can observe how circumstances developed over time, how ideas and institutions evolved, and how decisions made during one generation influenced those that followed.

The material presented throughout the series draws upon the wider research and historical collections of Emerald Archives. Wherever possible, individual articles place events within their broader Irish and international setting while remaining readable for both the general reader and those already familiar with Irish history. References and source information associated with the articles are available through the Emerald Archives website, enabling readers who wish to investigate particular subjects in greater depth to continue their research beyond the pages of each issue.

History is rarely a simple account of agreement and certainty. Surviving evidence may be incomplete, interpretations may change, and different historians may place differing emphasis upon the same events. Emerald Gazette recognises this complexity while seeking to present the available historical record clearly and responsibly. The objective is not to reduce Ireland’s past to a single narrative, but to provide readers with a gateway into the people, events and experiences that contributed to its development.

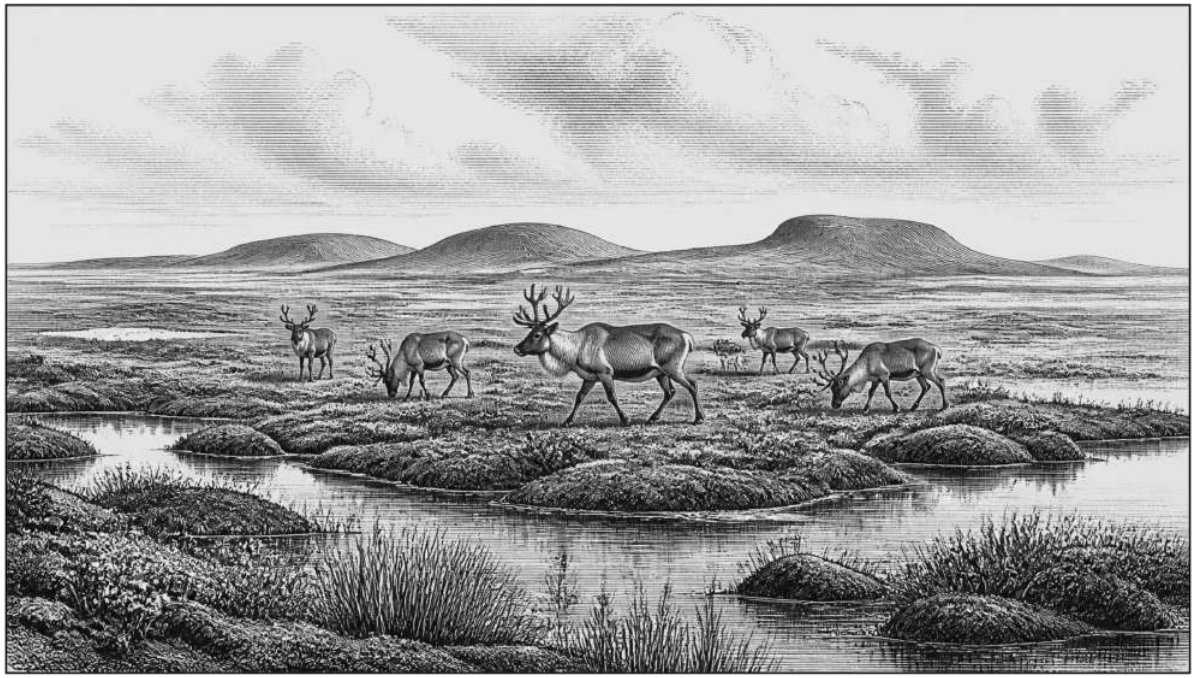
Every issue should therefore be understood both as an individual publication and as another chapter in a much larger project. Read separately, each volume offers a portrait of a particular historical period. Read together, the complete collection becomes an extended chronological journey through the story of Ireland.

We invite you to explore that journey, discover unfamiliar stories, revisit familiar events from new perspectives, and continue through the pages of Emerald Gazette as the remarkable history of Ireland unfolds.

Chapter 001 of 100

31300 BCE

Derryvree's Silt Flora [1]



A Date Without an Event

Nothing in the surviving evidence allows historians to say what happened in Ireland in the single modern-labelled year 31,300 BCE. No calendar then existed in Ireland, no written record was made, and no archaeological deposit can normally be resolved to a particular year at this depth in time. The date is best treated as a point within a much wider Late Pleistocene horizon: Marine Isotope Stage 3 (MIS 3), during the Midlandian cold stage of Irish Quaternary history. It was a period of abrupt climatic shifts, expanding ice and retreating ice margins, not an era of named peoples, states or dated events.

The closest useful chronological evidence is a freshwater deposit exposed at Derryvree, near Maguiresbridge in County Fermanagh. Organic silts and fine sands there produced a conventional radiocarbon result of 30,500 ± 1,200 radiocarbon years before present. "Before present" conventionally means before AD 1950; radiocarbon years are not calendar years. When calibrated against modern curves, the determination spans a broad interval, approximately 36,900–31,700 calibrated years before present. Thus 31,300 BCE falls broadly within the possible age-range of the deposit, but it cannot be represented as the date of a particular Derryvree pool, plant, animal or human action.

That imprecision is not a failure of the evidence. It is the evidence's proper scale. Derryvree preserves a sequence of environmental change across generations or millennia. It offers a rare window onto an Irish landscape that later glaciation mostly buried, disturbed or removed.

Freshwater Between the Tills

The Derryvree sequence was revealed by roadworks in 1969 through a drumlin: a streamlined hill formed beneath moving ice. Its importance lies in its order. A lower deposit of glacial till shows that ice had formerly crossed the area. Above it lay freshwater silts, sands and organic material, formed during an interval when standing or slow-moving water, wet ground and vegetation existed. An upper till subsequently sealed the sediments beneath another glacial advance. The site therefore demonstrates a changing northern Irish environment: glaciation, an ice-free freshwater phase, and renewed glaciation.

Plant macrofossils, pollen and insects from the freshwater beds indicate a cold, open and largely treeless landscape. Grasses, sedges, herbs, juniper and mosses formed much of the vegetation. Finds attributed to aquatic or wetland plants include bogbean (*Menyanthes trifoliata*) and alternate water-milfoil (*Myriophyllum alterniflorum*); mountain-avens (*Dryas octopetala*) points towards arctic-alpine conditions nearby. The combination has been interpreted as muskeg-like terrain: waterlogged, moss-rich ground broken by pools and channels, subject to frost and a short growing season.

This was not continuous permanent ice, nor was it a familiar green and wooded Ireland. It was a periglacial world in which freezing, thawing, shallow water and sparse vegetation controlled the shape of everyday ecology. The evidence demonstrates a functioning freshwater ecosystem in Fermanagh. It does not prove that every region of the island looked identical. Ireland’s varied relief, proximity to sea routes and changing ice margins would have produced local differences, while the record itself is fragmentary.

Cork’s Mammal Country

County Cork provides the principal faunal complement to Fermanagh’s environmental archive. Castlepook Cave, near Doneraile in the Awbeg valley, has produced an unusually rich collection of Late Pleistocene bones, much of it recovered in early excavations and later reassessed through the Irish Quaternary Fauna Project. Radiocarbon dates and species identifications show that Ireland was reached by a range of mammals between at least about 45,000 and 20,000 years ago, although individual finds do not necessarily belong to one moment or one undisturbed deposit.

The Castlepook assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, hare, stoat, arctic lemming, Norway lemming and spotted hyaena. This formidable list should not be imagined as a single herd or community visible on one day. Caves accumulate bone through many processes: carnivore denning, scavenging, natural death, water transport, collapse, excavation disturbance and the later mixing of old collections. Nevertheless, the animals securely establish that, during parts of MIS 3, southern Ireland could support a fauna now wholly unfamiliar on the island.

Reindeer and lemmings fit an open, cold landscape; mammoth and giant deer indicate that substantial herbivores could at times find sufficient forage; wolves and spotted hyaenas show that large carnivores also used this wider environment. Caves may have been refuges, dens or traps rather than ordinary places of animal residence. The bones tell us more confidently about regional animal presence than about the precise terrain immediately outside the cave mouth.

By 31,300 BCE, the climatic direction was increasingly consequential. The build-up of the last British–Irish Ice Sheet is generally placed after roughly 35,000–32,000 years ago, with maximum extent later, around 27,000–21,000 years ago. The nominated year therefore belongs before the Last Glacial Maximum, but within an era in which deteriorating cold and growing ice were narrowing ecological opportunities. Subsequent ice movement would erase or conceal much of the evidence needed to reconstruct this transition.

The Reindeer Femur Question

Castlepook has also become central to the question of Ireland’s earliest possible human visitors. A reindeer femur in the National Museum of Ireland’s Natural History collections has been publicly identified as bearing a deep mark made while fresh tissue was being removed with a sharp stone tool. County Cork heritage publications associate the specimen with an approximate age of 31,000 BC. If both the age attribution and the interpretation of the incision are upheld, the bone could indicate that one or more Upper Palaeolithic people processed a reindeer in Ireland during MIS 3.

This is important, but it must not be overstated. A radiocarbon date establishes the age of the animal material sampled; it does not automatically establish when a surface mark was made. Nor does one modified bone demonstrate a camp, a resident population, a hunting territory or an unbroken ancestry leading to later Irish communities. Distinguishing a stone-tool cut from damage caused by teeth, abrasion, breakage, sediment movement or earlier excavation requires careful taphonomic analysis. Castlepook’s early collection history and the complex formation of cave deposits add further caution.

Accordingly, the reindeer femur is best described as serious but still limited evidence for a possible early human presence, rather than proof of settled Ice Age Ireland. The more securely documented direct evidence for Upper Palaeolithic human activity remains much later: a butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to roughly 12,810–12,590 calibrated years before present. That later discovery does not disprove the Castlepook claim. It shows, rather, why the distinction between a promising clue and a well-contextualised body of evidence matters.

People, If Present

If people did reach Ireland around this broad period, they were almost certainly small, mobile hunter-gatherer parties, not an island-wide population. Across north-west Europe, Upper Palaeolithic communities used sharp stone tools and relied on detailed knowledge of animals, seasonality, shelter, fuel and routes through difficult terrain. Reindeer could supply meat, fat, hide, sinew and bone. Yet those general comparisons cannot fill Ireland with unexcavated camps. No securely dated house, hearth, stone-tool assemblage, burial, food store, clothing fragment or boat belonging to this Irish horizon has been found.

For that reason, political affairs, diplomacy and organised conflict are beyond recovery. There is no evidence for chiefs, territories, alliances, warfare or institutions in Ireland at this time. The same restraint applies to religion, language, art and learning. People capable of symbolic culture lived elsewhere in Upper Palaeolithic Europe, but no Irish cave art, ritual object, grave or symbolic assemblage can responsibly be assigned to 31,300 BCE. Absence of evidence does not prove absence of thought, belief or social ties; it means that the Irish record cannot describe them.

Even travel requires caution. Lower global sea levels altered coastlines and may have changed access between Ireland, Britain and continental Europe, but the geography of crossings was shaped by sea, ice, rivers and shifting margins. The evidence does not permit a confident route, season or direction of movement. Any possible visitors may have come briefly, followed animal movements, or entered a landscape already becoming less hospitable as glaciation intensified.

An Economy of Survival

There is no evidence for farming, herding, metalworking, pottery, trade networks or permanent villages. The only economy that can be cautiously contemplated is the direct use of wild resources by mobile foragers, if the Castlepook modification proves human-made. Such an activity would have been organised around survival rather than production surplus: obtaining animal food and raw materials, making and maintaining stone edges, seeking shelter, and moving in response to weather and game.

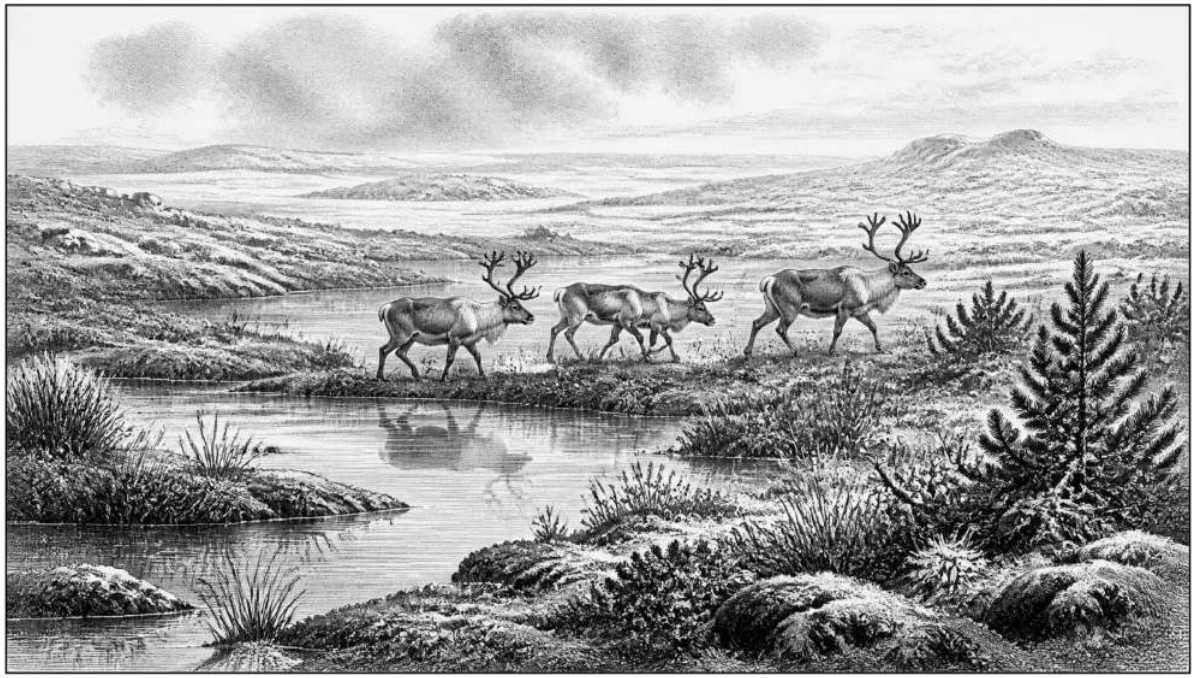
Butchery need not have occurred in Castlepook Cave itself. A carcass could have been processed outdoors, after which carnivores or water introduced a limb bone into the cave. This possibility is not a defect in the interpretation; it is exactly why the find cannot tell us whether humans hunted the animal, scavenged it, or merely handled part of a carcass. It does, however, place the practical business of exploiting large animals at the centre of the question.

The dominant historical development around 31,300 BCE was therefore environmental. Northern Ireland’s Derryvree silts preserve plants, insects and water in a cold tundra wetland. Castlepook records a southern Irish fauna that included reindeer, mammoth and hyaena. Together they overturn any simple image of an eternally ice-covered or biologically empty Ireland. Yet the same archives reveal instability: a land capable of sustaining life in particular intervals, then transformed and buried by advancing ice. That unstable setting, rather than a datable political event, is the responsible history of Ireland at this remote point in time.

Chapter 002 of 100

31299 BCE

BIRM-166’s Mossland Basin [2]



31,299 BCE is not a year that can be recovered from the Irish archaeological record in the ordinary historical sense. It is a modern calendar label, approximately 33,250 calibrated years before present (where “present” is AD 1950), imposed on an era known through deposits, bones and changing landforms rather than written testimony. No Irish find can be assigned responsibly to this exact year, season or generation. The appropriate frame is the later part of Marine Isotope Stage 3, a highly variable interval of the last Ice Age, and the calibrated ranges within which individual samples fall.

The closest and most revealing Irish environmental archive is at Derryvree near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic sediment between two distinct sheets of glacial till. The basic sequence is secure: an earlier ice advance deposited till; later, in an ice-free interval, freshwater and organic material accumulated; a subsequent glacier covered and sealed that landscape beneath new till. It is a remarkable survival, because later ice repeatedly scoured or disturbed much of Ireland’s older Pleistocene evidence.

A Date Within a Long Interval

Organic material from the Derryvree deposit produced radiocarbon determination BIRM-166: 30,500 radiocarbon years before present, with a substantial laboratory uncertainty of +1,170/–1,030 years. A radiocarbon age is not a calendar age. Atmospheric carbon-14 levels varied considerably during the Ice Age, and calibration converts a measurement into a probability range, not a precise historical date. Published discussion has placed the Derryvree material broadly around 36,900–31,700 calibrated years before present. The modern label 31,299 BCE falls within this broad span, but that overlap does not date a particular pool, plant, animal or human action to the numbered year.

The deposit therefore illuminates a period rather than supplying an annual chronicle. It demonstrates that northern Ireland was not simply and continuously buried beneath ice throughout the last glacial period. At Derryvree, for at least part of the interval represented by the sediments, there was exposed ground, liquid freshwater and enough biological productivity to preserve a distinctive fossil assemblage. Equally, this local evidence must not be inflated into a map of all Ireland. Conditions varied with altitude, distance from the coast, glacier margins and the abrupt climatic shifts characteristic of the North Atlantic world.

Wet Ground in a Treeless Country

Derryvree's pollen, plant macrofossils, mosses and insects indicate an open, cold and largely treeless environment. Grasses, sedges, herbs, juniper and a specialised moss flora point towards tundra or muskeg-like ground: waterlogged hollows, shallow pools, plant-rich margins and patches of sparse dry-land vegetation. Fossils include bogbean (*Menyanthes trifoliata*) and mountain avens (*Dryas octopetala*), plants strongly associated with cold, open conditions. The insect evidence also supports wet terrain with standing water and mossy margins rather than a uniform frozen wasteland.

This was not Ireland's later image of dense woodland, enclosed fields and peat bogs. Short summers could bring concentrated plant growth around pools and channels, while winters were severe and prolonged frost was a major force in the landscape. Seasonal thaw, saturation and freezing would have shaped soils and sediment, and wind exposure would have limited taller vegetation. The very presence of freshwater sediment is important: it shows that water moved and pooled during the depositional phase. It does not mean that the climate was mild, nor that every part of the island was habitable in the same way.

The broader regional setting was one of change. Ireland lay at the north-western edge of Europe, connected environmentally to Britain and the exposed lands of the Irish Sea basin when sea levels were far lower than today, but its routes were never static or simple. Ice margins advanced and retreated; coastlines, rivers and lowlands shifted; and animal movements depended on terrain that could be interrupted by water, ice and inhospitable ground. The full Last Glacial Maximum lay ahead. Reconstructions generally place the last maximum expansion of the Irish Ice Sheet around 27,000–23,000 calibrated years before present, several millennia after this nominal date, although ice was already a powerful and fluctuating presence in the wider region.

Animals of the Pre-Maximum Landscape

Southern Irish caves provide a complementary, though differently preserved, record. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork yielded a rich collection of Ice Age bones during antiquarian excavations in the early twentieth century. Reassessment and radiocarbon dating undertaken through the Irish Quaternary Fauna Project showed that a range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. The cave record includes reindeer, woolly mammoth and spotted hyaena, among other animals. It establishes that sizeable mammals used parts of Ireland in pre-maximum phases of the last glaciation.

Cave assemblages nevertheless demand caution. Bones can be brought into caves by carnivores, water, collapse or people; they may derive from different episodes separated by many generations; and the earliest excavations did not record stratigraphy to modern standards. Castlepook should not be pictured as a single living scene in which every recorded species met at once. Rather, it is an accumulated archive of

changing animal communities. Reindeer are especially compatible with the open, cold landscapes suggested by Derryvree, while mammoth and hyaena underscore that Ireland was, at intervals, part of a wider north-west European fauna rather than an isolated ecological world.

The Reindeer Femur Question

One Castlepook find brings the question of people unusually close to this period. A reindeer femur from the old collection has been reported as dating to about 31,000 BCE and bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as a cut or chopping trace made by a sharp stone implement during carcass processing. If that interpretation is confirmed, it is potentially Ireland's earliest evidence that humans handled an animal, extending the island's known human story far beyond the much later Mesolithic record.

Its significance is real, but its limits are equally important. The bone's date is an estimate for the death of the animal, not a timestamp for an act of butchery. A marked bone is not a settlement, and it does not demonstrate a camp, a hearth, a dwelling, a burial, a tool assemblage, a permanent population or a route of arrival. No securely associated Upper Palaeolithic occupation floor has yet been recovered in Ireland for this interval. Nor can one infer a named people, language, ancestry or repeated seasonal visits. The most cautious conclusion is that a brief human presence is possible, and that the femur may preserve evidence of it.

If people did reach Ireland during this broad phase, their likely way of life can only be inferred from the material requirements of the mark and from Upper Palaeolithic contexts elsewhere in north-west Europe. They would have been highly mobile hunter-gatherers, capable of maintaining sharp stone edges and exploiting large game. Reindeer carcasses supplied meat, marrow, hides, sinew, antler and bone; yet none of these uses can be demonstrated at Castlepook beyond the proposed modification of one femur. Hunting tactics, campsites, family size and the frequency of travel remain unknown.

No Polities, No Monuments

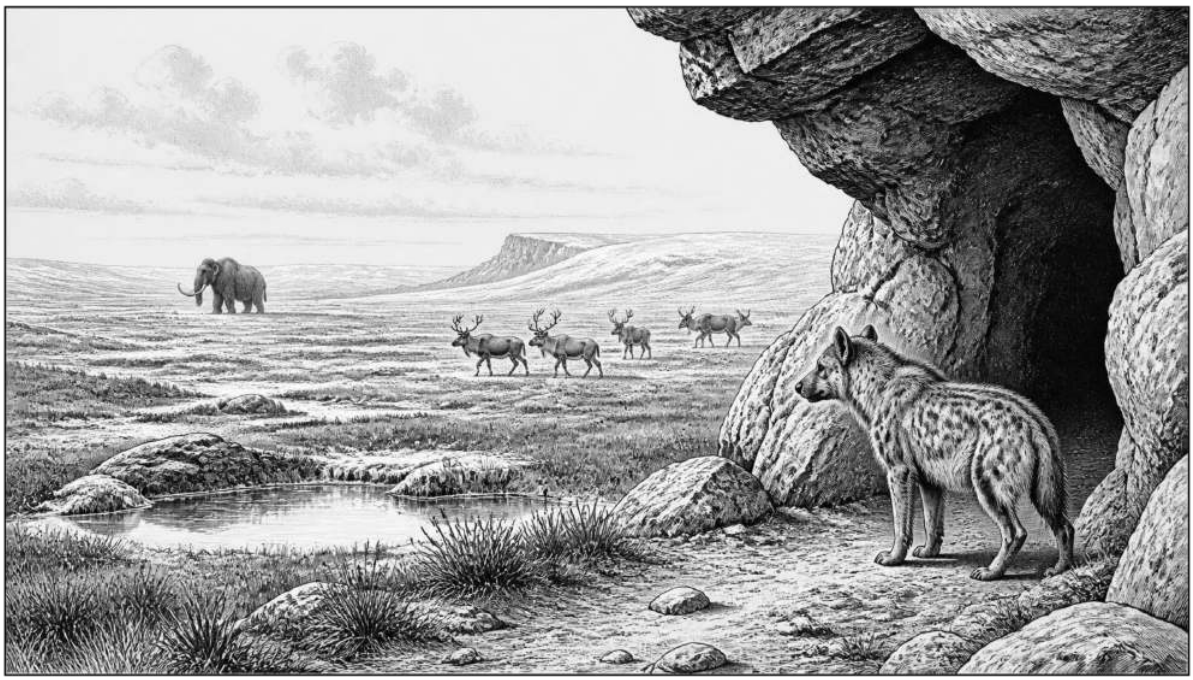
There is no evidence for political authority, organised warfare, diplomacy, formal religious institutions, monuments, farming, pottery, metalworking or trade networks in Ireland at this date. These are not gaps awaiting names from lost chronicles: they are categories for which the surviving record offers no support. It would be misleading to project later Irish societies, or even the much later Mesolithic world, backwards into this glacial landscape. Likewise, no art, ritual or system of learning can be attributed to Ireland around 31,299 BCE. Should the Castlepook cut mark prove anthropogenic, it would show practical knowledge and a technological act, not a documented culture in the fuller archaeological sense.

The most important development around this notional year was environmental possibility. Derryvree records an ice-free, biologically active northern landscape during a long cold interval. Castlepook records that large mammals could reach southern Ireland, and perhaps that people did too. Both archives are fragile reminders that the island's deep past was shaped not by continuity but by repeated ecological opening and closure. Later maximum glaciation would transform the landscape again, erasing much of what had existed. What remains is enough to reject the idea of a permanently empty, wholly ice-covered Ireland before the end of the Ice Age, but far too little to turn 31,299 BCE into a conventional year of events.

Chapter 003 of 100

31298 BCE

Castlepook’s Hyena Horizon [3]



“31,298 BCE” is a modern chronological label, not a date that can be recovered from an Irish record of events. No calendar, settlement sequence or securely stratified archaeological site allows historians to say what happened in Ireland in that particular year. In scientific terms, the point lies about 33,250 years before AD 1950, within the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3), an unstable part of the last Ice Age. The responsible scale is therefore not a single year but calibrated ranges of centuries and millennia. Ireland at this depth of time is known chiefly through caves, fossil animals, glacial sediments, plant remains and the dating of those deposits.

The most evocative Irish evidence relevant to this horizon comes from Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. It is not a prehistoric village and has yielded no secure domestic floor, hearth, house or cemetery of this age. Rather, it is a limestone cave system whose deposits and old collections contain an exceptional record of Ice-Age mammals. Its importance lies in showing that Ireland, before the maximum spread of the last ice sheet, formed part of a wider north-west European ecological world.

A Date Beyond Annals

Dating this world is necessarily complicated. Radiocarbon results are expressed first in radiocarbon years before present, where “present” conventionally means AD 1950; they must then be calibrated against independently dated records because atmospheric carbon-14 has varied through time. The IntCal20 curve extends back to 55,000 calendar years before present, but even a good measurement produces a probability range rather than a pin-point historical date. A calendar conversion from 31,298 BCE is useful for organising an archive, not evidence that archaeologists can isolate the corresponding season or generation.

That caution matters particularly at Castlepook. Most of its famous fauna was excavated in the early twentieth century, when methods of excavation, recording and bone treatment were very different from those now expected. Bones came from a cave complex used and disturbed by water, carnivores, sediment movement and later investigation. Recent reassessment has shown that several older radiocarbon measurements from southern Irish cave assemblages require reconsideration because improved sampling and ultrafiltration techniques can yield substantially older results. The cave is consequently a vital archive, but not a simple, undisturbed time capsule.

The broad conclusion is firmer than any precise reconstruction: large mammals occupied or reached Ireland during the middle and later parts of the last glacial period, well before the Last Glacial Maximum. Geological Survey Ireland identifies Castlepook as the country’s richest site for vertebrate remains dating towards that maximum, with dated material spanning a long interval, approximately 45,700 to 19,950 years before present. Not every species need have lived there together, and no single date represents the whole assemblage. Yet the collection establishes repeated animal presence in an Ireland that would later be profoundly transformed by expanding ice.

A Cave of Predators and Prey

Castlepook’s fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf and spotted hyena, alongside smaller cold-adapted animals such as Arctic fox, lemmings, hare and stoat. Such a list should not be converted into a picturesque parade in which every animal appears side by side. The remains accumulated over a long period, and caves selectively preserve bones brought in by predators, scavengers or moving water. Even so, the combination indicates an open, cold landscape capable of supporting grazing animals and their predators.

Spotted hyena gives the title its particular force. Hyenas were not exotic visitors from a warmer Africa: Pleistocene spotted hyenas ranged across Europe and were highly effective hunters and scavengers in cold-steppe environments. At Castlepook, their bones and the patterning of other faunal remains make the cave especially important for understanding carnivore activity in Ireland. A cave was probably a place of danger and intermittent occupation for animals, rather than a neutral shelter. Hyenas may have dragged carcass parts underground, while bears, wolves and smaller scavengers also formed part of the food web.

Woolly mammoth and reindeer are equally significant. They point towards the mammoth-steppe or tundra-steppe conditions familiar from many Late Pleistocene regions: treeless or sparsely wooded country, productive in grasses, sedges and herbs during the short growing season, but exposed to severe winter cold. Giant deer, the animal later called the Irish elk, was not uniquely Irish, but its fossils are central to Ireland’s deep past. Their presence confirms that this was not an empty, frozen island. It was a changing habitat in which large herbivores could move through suitable terrain, pursued by carnivores and subject to abrupt climatic shifts.

Fermanagh’s Buried Wetland

County Fermanagh offers a different, more local kind of evidence. At Derryvree, near Maguiresbridge, road works cut through a drumlin and exposed freshwater silts and fine sands sealed between glacial deposits. The organic horizon produced a radiocarbon result of 30,500 ± roughly 1,100 radiocarbon years before present. That measurement does not date 31,298 BCE exactly, and calibration

places it earlier than the nominal calendar year considered here. It nevertheless illuminates a related MIS 3 interval in which northern Ireland had cold, periglacial wetlands before renewed glaciation buried the evidence.

Pollen, plant macrofossils, mosses and beetles from Derryvree describe an open tundra environment rather than the familiar woodland of later Ireland. Sedges, aquatic plants and moss-rich ground occurred around pools and wet hollows. The evidence has been interpreted as a muskeg-like wetland mosaic, with shallow water, saturated ground and sparse vegetation beyond it. The site does not prove that every part of Ireland looked identical. It does demonstrate that Ice-Age Ireland contained ecological variety: waterlogged basins could preserve plants and insects even while exposed uplands and open plains remained cold, windy and thinly vegetated.

Climate was not static. Greenland ice-core records show that MIS 3 was marked by dramatic millennial-scale shifts between colder stadials and relatively milder interstadials. Around 32,000 years before present, Greenland evidence indicates stadial conditions, but translating that signal into a temperature or snowfall figure for any Irish valley would be unsafe. Ireland stood at the Atlantic edge of Europe, where ocean conditions, sea ice, wind and the growth of the British–Irish Ice Sheet could make local responses complex. The sound historical conclusion is one of pronounced variability and growing environmental pressure, not a claim for a fixed national climate.

Land, Sea and Ice

Ireland was also geographically unlike the modern island, although the popular image of a permanent “land bridge” should be avoided. Global sea level was much lower during glacial times, exposing land on continental shelves and changing coastlines. Ice margins, marine channels and local isostatic movements also changed the routes available to animals. The presence of mammoth, reindeer, hyena and other continental species shows that connection or passage was possible at various times. It does not establish one continuous dry route, nor does it identify the path by which a particular herd entered Ireland.

Ice-sheet research makes the date especially transitional. The Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest overall extent, came later, broadly between about 27,000 and 21,000 calendar years ago, although individual sectors advanced and retreated at different times. Evidence from western and southern Ireland suggests substantial ice-sheet activity before that maximum as well. At about 31,298 BCE, the island was therefore not simply “before the ice” or wholly under it. Different regions may have experienced different combinations of open country, perennial snow and ice, advancing margins, and terrain affected by severe frost.

The later ice sheet would erode, bury and rearrange much of the earlier landscape. This helps explain why evidence is so fragmentary. Potential campsites on exposed ground may have been destroyed; former coastal plains now lie beneath the sea; and caves, though valuable, have their own biases. Absence of a settlement is not proof that no person ever entered Ireland. But it is equally important not to treat that possibility as demonstrated occupation.

People: Possibility, Not Population

Claims for human activity in Ireland at roughly this depth of time require particular restraint. A reindeer femur from Castlepook has been reported as bearing a linear modification interpreted by some as a fresh-bone cut or chopping mark made with a sharp stone tool. If that interpretation and its dating were

securely upheld, it could indicate that a human visitor processed a reindeer carcass in Ireland far earlier than the well-established Late Upper Palaeolithic evidence from Alice and Gwendoline Cave in County Clare, dated to about 12,810–12,590 calibrated years before present.

Yet the Castlepook bone cannot currently sustain a larger story of settlement, community or migration. The animal’s date is not automatically the date of the mark; the bone was not recovered in a modern excavation with an associated lithic assemblage, hearth, dwelling, repeated butchered refuse or human remains. Marks on bone must be distinguished from carnivore damage, trampling, breakage, weathering and excavation scars. The prudent description for around 31,298 BCE is therefore a contested indication of possible human activity, not proof of a permanent Irish population.

For the same reason, political affairs, diplomacy, named leaders, warfare, religion and formal learning cannot be reconstructed. No polity, tribe, ritual practice, language or belief system is known from Ireland at this date. If people did visit, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds documented elsewhere in Europe, where knowledge of animal behaviour, stone-working and seasonal landscapes was essential. That comparison can suggest possibilities, but it cannot fill Ireland’s evidential silence with imported customs.

Economy Without Markets

There is no evidence for farming, herding, pottery, metalworking, markets or long-distance trade in Ireland at this point. The only securely visible “economy” is ecological: herbivores converted short-season vegetation into meat and movement; predators and scavengers exploited them; caves became repositories for selected remains. If humans were present, hunting and carcass processing would be plausible activities, but still unproven beyond the disputed bone modification.

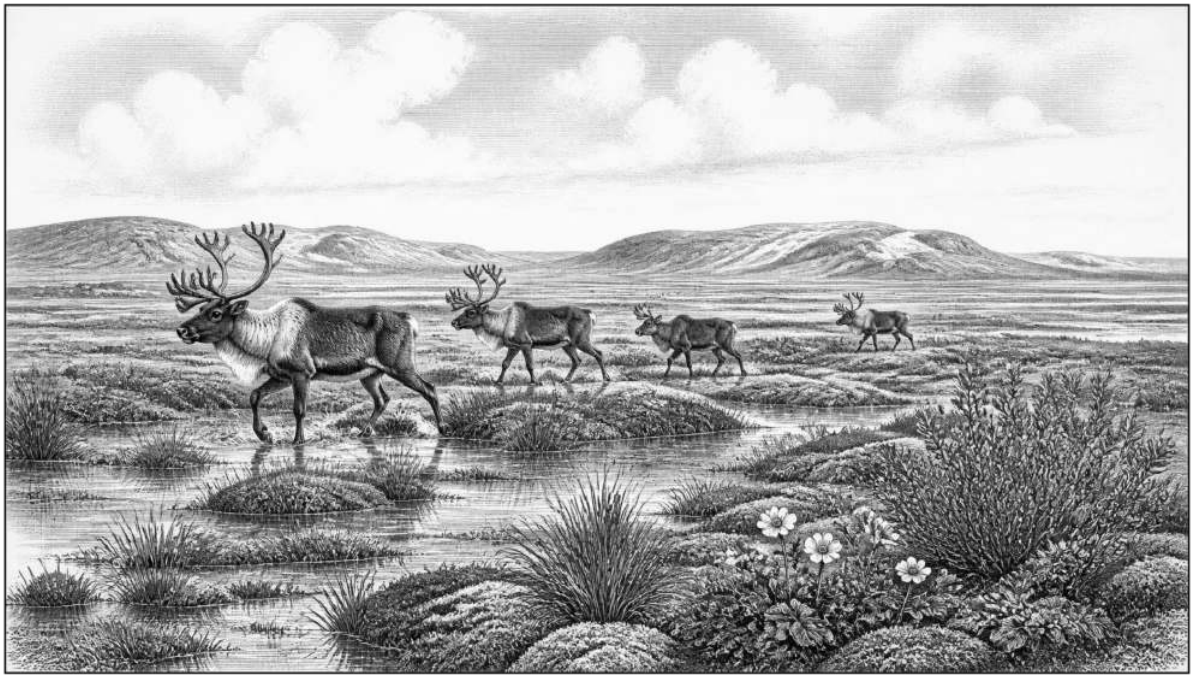
Recent sedimentary ancient-DNA work at Castlepook adds a promising, explicitly preliminary line of evidence. A 2026 preprint reported ancient genetic traces from twelve taxa, including mitochondrial sequences from Irish cave hyenas and woolly mammoths. It argues that the Irish animals belonged to wider Eurasian populations and supports faunal connectivity before the Last Glacial Maximum. As a preprint, it should not be treated as the final word; nevertheless, it shows how old cave sediments may yet refine the story of routes, populations and vanished animals.

For now, the lasting significance of this year lies not in an event but in a horizon. Castlepook and Derryvree reveal an Ireland of mammoths and hyenas, reindeer and wet tundra, advancing ice and altered coastlines. They also teach a methodological lesson: deep history becomes more truthful, not less compelling, when its limits are stated plainly. Around 31,298 BCE, Ireland can be seen as an intermittently accessible, environmentally severe part of Ice-Age Europe. Whether a person stood beside a reindeer there remains an important question, not an established fact.

Chapter 004 of 100

31297 BCE

Fermanagh’s Mountain-Avens Bed [4]



31,297 BCE is a modern calendar label, not a year that can be recovered from Ireland’s prehistoric record. No Irish community then kept a calendar whose entries can be aligned with it, and no archaeological layer can identify a particular journey, hunt, birth or death in that single year. In chronological terms, the date falls about 33,250 calendar years before AD 1950 (cal BP), within the Late Pleistocene, broadly Marine Isotope Stage 3 (MIS 3). The responsible history of this moment is therefore one of calibrated ranges, sediments, fossils and changing climate rather than named people or events.

The closest unusually informative evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. In 1969, road works cut through a drumlin and exposed fine freshwater sands, silts and organic deposits enclosed between two thick sheets of till, the unsorted debris left by glacier ice. The stratigraphy matters: the lower and upper tills demonstrate glacial episodes, while the organic bed proves that the locality experienced an intervening ice-free phase. Its original radiocarbon determination, 30,500 ± 1,100/1,030 radiocarbon years BP, calibrates only broadly, approximately 33,500 ± 1,200 cal BP. That span includes the requested date, but it cannot be narrowed responsibly to a precise calendar year.

An Ice-Free Fermanagh

Derryvree reveals a severe but living landscape. Pollen, plant macrofossils, mosses and insect remains point to treeless, tundra-like wetland rather than to the woods associated with later Irish prehistory. Grasses, sedges and herbs occurred alongside cold-tolerant plants such as mountain avens, dwarf willow and bogbean. The presence of aquatic and waterside plants shows that shallow pools, slow water and

waterlogged ground existed despite the harsh climate. Moss-rich ground, decaying vegetation and open pools created a patchwork sometimes described as muskeg: wet, peaty tundra broken by small bodies of water.

This was not necessarily an unbroken white wilderness. Summer growth must have been sufficient for plants, insects and grazing animals; frost, snow cover and short growing seasons nonetheless shaped the annual rhythm. The evidence indicates sparse local vegetation, and probably cold winters, but it does not give a complete island-wide map. A handful of tree-pollen grains in the deposit cannot safely be taken as evidence of nearby woodland: pollen can travel far or be redeposited. The firm conclusion is more limited and more useful. Around this broad horizon, part of inland Fermanagh was open, cold and wet, yet not buried under permanent glacier ice.

Crag Cave in County Kerry supplies an independent climatic indication. Uranium-thorium dating of its speleothems shows episodes of calcite growth during MIS 3. Dripstone grows when liquid water passes through cave systems, so its formation demonstrates that south-west Ireland periodically experienced conditions allowing water circulation underground. It does not mean that every region was mild, nor does it date a human occupation. Together with Derryvree, however, it confirms that the long Ice Age was climatically changeable: cold phases and relatively milder interludes succeeded one another rather than proceeding as one simple descent into glaciation.

Animals in an Open Country

At Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, cave deposits and museum collections preserve a striking Late Pleistocene fauna. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena. Individual bones do not all necessarily belong to the same moment: early excavations disturbed deposits, and later dating has repeatedly shown that cave collections can contain material of different ages. Yet radiocarbon results place some Castlepook mammals broadly in the middle part of the last glacial cycle, including dates around 35,000–33,000 radiocarbon years BP for mammoth, hyaena and reindeer remains.

The animal evidence supports an interpretation of periodically open grass-herb and tundra environments capable of sustaining large grazers and browsers, as well as predators and scavengers. Reindeer were especially suited to cold open country; mammoths and giant deer attest a fauna now absent from Ireland. Spotted hyaena is important because it warns against treating caves as straightforward human shelters. Carnivores may have dragged prey or bone into cave passages, while water, collapse and later digging could mix deposits. A bone in a cave is evidence for an animal’s presence, but not automatically for a stable local herd, a kill-site or a human camp.

These animals also underline how different Ireland’s ecology was from that of later millennia. The large, distinctive Irish giant deer was not a product of medieval folklore or a single “Irish elk” landscape; it was one member of changing Pleistocene faunas shared, at intervals, with north-western Europe. Its enormous antlers and the remains of mammoth, hyaena and lemming survive because caves and protected sedimentary contexts occasionally escaped the destruction caused by later ice, erosion and acidic soils. The rarity of such survival is central to the story. Ireland’s record is fragmentary not because nothing happened, but because repeated glaciation removed or buried much of what might once have existed.

The Reindeer Femur Question

The possibility of people in Ireland near this period rests chiefly on one controversial but significant object: a reindeer femur fragment from Castlepook. It has been reported as bearing a deep linear mark consistent with fresh-bone cutting or chopping by a sharp stone implement, and the bone has been publicised as dating to roughly 33,000 years ago. If the modification is confirmed as anthropogenic, it would be evidence that Upper Palaeolithic people handled a reindeer in Ireland long before the Last Glacial Maximum. It would not, by itself, prove permanent settlement, a population size, an ethnicity, a language or a continuous human history on the island.

Caution is essential. The femur was recovered from an old cave collection rather than from a modern, sealed excavation context accompanied by an undisputed stone-tool assemblage, hearth, dwelling floor or burial. Natural breakage, carnivore damage and later disturbance must be excluded rigorously when interpreting marks on ancient bone. Renewed Castlepook excavations have demonstrated the potential of undisturbed portions of the cave system, but the wider archaeological case is still far thinner than the faunal evidence. The best-supported statement is that brief human activity is possible, perhaps plausible, around this horizon; an established Irish community remains unproven.

For comparison, securely dated evidence of terminal Pleistocene human activity comes much later from Alice and Gwendoline Cave in County Clare. A butchered brown-bear patella has produced calibrated dates of about 12,810–12,590 cal BP and 12,810–12,685 cal BP. Later work has also exposed the complex formation of that cave’s deposits, demonstrating why context and taphonomy matter so much. The contrast is instructive: a promising individual find at Castlepook should prompt investigation, not certainty beyond what its context permits.

People, Movement and Knowledge

If people did reach Ireland around 33,250 cal BP, they were mobile hunter-gatherers rather than farmers, town-builders or subjects of a state. Their practical knowledge would have included tracking animals, locating drinkable water, finding suitable stone, navigating seasonal weather and managing fire, clothing and food in a cold environment. These are reasonable inferences from Upper Palaeolithic survival elsewhere in north-west Europe, not observations directly made in Ireland. No Irish hearth, house, burial, tool workshop, ornament or art of this date presently allows a fuller reconstruction of daily life.

Nor is there evidence for political institutions, warfare, diplomacy, organised religion, trade routes or named regional groups. It would be misleading to create them merely because such headings suit later historical periods. Lower sea levels changed coastlines and enlarged exposed land around Ireland, potentially altering routes for animals and people, but they do not demonstrate a particular land crossing at this date. Any visitors may have arrived only occasionally, perhaps following animal movements during favourable climatic windows; equally, some animal remains could represent populations whose movements had no human counterpart.

Approaching a Major Transformation

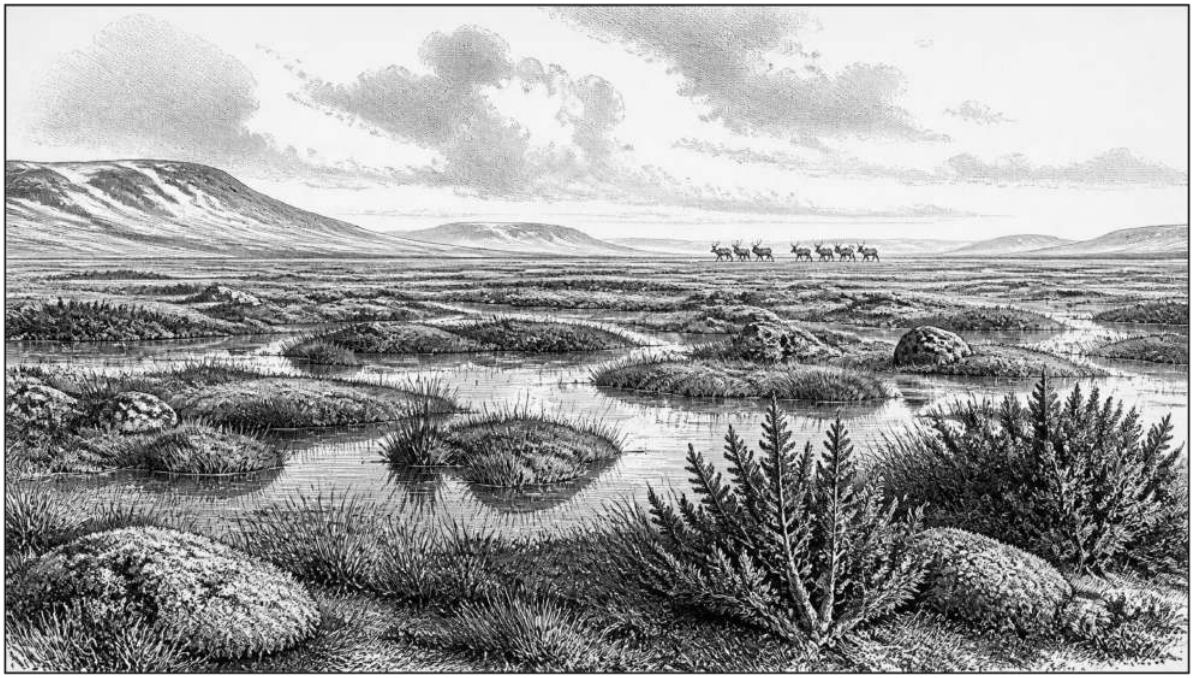
This interval preceded, rather than belonged to, the fullest expansion of the last British-Irish Ice Sheet. Reconstructions differ in detail, but its maximum extent occurred considerably later, broadly around 27,000–21,000 years ago. As climate deteriorated, advancing ice and periglacial conditions profoundly reduced habitable landscapes and damaged older deposits. The environmental record at Derryvree, the cave fauna at Castlepook and the dripstones at Crag Cave are valuable precisely because they preserve glimpses of a shifting world before that later glacial maximum reshaped much of the island.

Thus the most important development relevant to 31,297 BCE was not a recorded political event but an environmental interval in which parts of Ireland were ice-free, cold and ecologically productive. Wet tundra in Fermanagh, intermittent liquid water in Kerry and a diverse cold-stage fauna in Cork show that this was a varied landscape, not an empty abstraction labelled “the Ice Age”. The evidence may yet reveal more about human visits. For now, it supports a careful history of Pleistocene environments and animals, with the possibility—but not the demonstrated permanence—of people at Ireland’s north-western edge.

Chapter 005 of 100

31296 BCE

Derryvree’s Periglacial Seedbank [5]



The label “31,296 BCE” is a modern way of locating a point in deep time, not a year for which Ireland has an event-by-event history. In the dating convention used by archaeologists, it lies about 33,245 years before AD 1950, the reference point for “BP” (before present). That does *not* make it an exact archaeological timestamp. At this age, radiocarbon results require calibration because atmospheric carbon-14 varied over time, and calibration produces probability ranges rather than a single secure calendar year. The responsible subject is therefore Ireland during a broad later Marine Isotope Stage 3 (MIS 3) interval, before the Last Glacial Maximum, rather than an imagined occurrence in one numbered year.

A Window Between Ice Advances

The most valuable Irish evidence close to this timescale comes not from a settlement, but from a buried natural archive at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands containing organic material, trapped between two layers of till: the unsorted debris laid down by glacier ice. Their order is crucial. A glacial episode created the lower till; water, plants and small animals left traces during an interval when ice was absent locally; then a later glacier sealed the deposits beneath another till. The upper ice advance preserved what it also partly obscured.

Organic material from this deposit, Birm-166, returned a conventional radiocarbon age of 30,500 ± 1,200 radiocarbon years BP. Later calibration has expressed the result broadly as c. 36,900–31,700 calibrated years BP. The nominal date of 31,296 BCE falls within that wide span, but the distinction matters: the deposit accumulated over time and cannot tell us what happened in that particular year,

season or generation. Nor can one Fermanagh wetland stand for the whole island. It does, however, offer rare direct testimony that a locally ice-free, freshwater landscape existed in northern Ireland during part of this cold and changing period.

Plants of a Harsh Wetland

Derryvree's plant and insect evidence points to open, treeless tundra rather than the wooded Ireland familiar from much later prehistory. The assemblage includes grasses and sedges, herbs, juniper and a rich moss flora. Fossils of bogbean, dwarf willow, mountain-avens and lesser clubmoss reinforce the picture of cold-adapted vegetation around wet ground. Freshwater traces, including water-milfoil, indicate pools or slow water. Older investigators used the word "muskeg" for this mossy, waterlogged terrain: a useful description of saturated hollows and organic-rich pools, though not a complete map of the wider landscape.

This was not necessarily an unbroken snow desert. Short growing seasons could produce productive patches beside water, while exposed ground supported sparse low vegetation. Yet the interpretation remains ecological, assembled from the preferences of surviving plant remains, pollen and insects. Pollen can travel, sediments can be reworked, and the site preserves only a small portion of a former landscape. What the evidence securely rules out is a dense temperate forest at Derryvree. It strongly suggests severe winters, frequent freezing and thawing, and a climate in which water, moss, sedge and low shrubs occupied sheltered or seasonally wet places.

Castlepook's Animal Archive

County Cork supplies a complementary, though differently formed, record. Castlepook Cave near Doneraile, also known as Mammoth Cave, is Ireland's outstanding pre-Last Glacial Maximum vertebrate site. Excavations in the early twentieth century recovered more than 2,000 bones, while later dating programmes showed that the cave assemblage accumulated across a long interval rather than during one moment. Its fauna includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. The National Museum of Ireland holds important elements of this collection, including a spotted-hyaena skull.

Those animals demonstrate that Ireland was accessible to a far broader cold-stage mammal community than its modern fauna. Reindeer and mammoth indicate open country capable of supporting large grazers; predators and scavengers indicate a food web with carrion as well as living prey. But caution is essential. A cave is a collecting place, not a census. Hyaenas may have dragged bones in, water could move material, animals might die naturally in or near passages, and early excavations did not meet modern standards of stratigraphic recording. Bones dated thousands of years apart cannot be turned into one perfectly contemporary scene. Castlepook reveals recurring animal use of Ireland, not a single herd assembled in 31,296 BCE.

Ice, Water and Access

This was a period of rapid environmental instability. The British–Irish Ice Sheet had not yet reached its later maximum extent, generally placed within roughly 27,000–21,000 years ago in older syntheses and examined in more detail by recent reconstructions. Its growth and retreat were neither uniform nor identical in every Irish region. Evidence from Ireland, Britain and adjacent seas indicates dynamic ice

activity during MIS 3, while the precise outline of ice at any one moment remains debated. Derryvree's inter-till deposit shows local freedom from ice during its formation; it must not be used to claim that all Ireland was then ice-free.

Nor should modern coastlines be projected backwards. Sea level, glacial loading of the land and the form of the Irish Sea basin all affected whether animals and people faced dry ground, ice, water or a changing combination of them. The arrival of large mammals shows that routes into Ireland existed at intervals, but it does not identify a permanent land bridge, a particular crossing point or a route usable in every century. Ireland's status as an island or near-island was environmentally consequential: access was a changing constraint, not a simple yes-or-no condition.

The Human Question

The most provocative evidence is a fragment of reindeer femur from the historic Castlepook collection. Zooarchaeologist Ruth Carden's re-examination identified a deep mark reported as consistent with cutting or chopping fresh bone using a stone tool; the bone has been reported as about 33,000 years old. If that assessment is confirmed, it may record the processing of a reindeer carcass by Upper Palaeolithic people in Ireland far earlier than the well-established later settlement record. Such an encounter would be historically important, but its limits are equally important.

The bone is not from a newly excavated, undisturbed occupation surface. No securely associated hearth, lithic assemblage, dwelling, burial, human bone, ornament or artwork establishes a camp or resident community in Ireland at this date. A radiocarbon determination dates the animal bone, while identification of a surface mark as human-made is a separate taphonomic judgement; trampling, carnivore action, sediment abrasion, excavation damage and handling must be excluded. The National Museum of Ireland accordingly continues to describe clear Palaeolithic proof of humans in Ireland as absent. The careful conclusion is that a brief human visit or carcass-processing episode is possible, not that permanent occupation has been demonstrated.

What Cannot Be Claimed

There were no Irish states, kings, borders, diplomatic missions or named peoples that can responsibly be assigned to this date. There is likewise no Irish evidence for warfare, agriculture, trade networks, formal religion, monuments, writing, schools or artistic traditions in the thirty-second millennium BCE. Upper Palaeolithic communities elsewhere in Europe made sophisticated tools, clothing, art and social connections, but those achievements are context, not evidence for their presence at Derryvree or Castlepook. It would be anachronistic to call any possible visitors "Irish" in an ethnic, linguistic or political sense.

The economy that can be discussed is ecological rather than institutional. Large herbivores converted sparse vegetation into meat and other resources; carnivores, hyaenas and perhaps occasional people exploited carcasses. If people reached Ireland, mobility and knowledge of seasonal animal movements would be plausible in a wider north-west European context, but they remain inference rather than demonstrated Irish practice. The principal story is therefore not a human polity but a precarious living landscape: wetland plants surviving frost, grazing mammals finding open forage, and ice repeatedly reshaping the ground on which all depended.

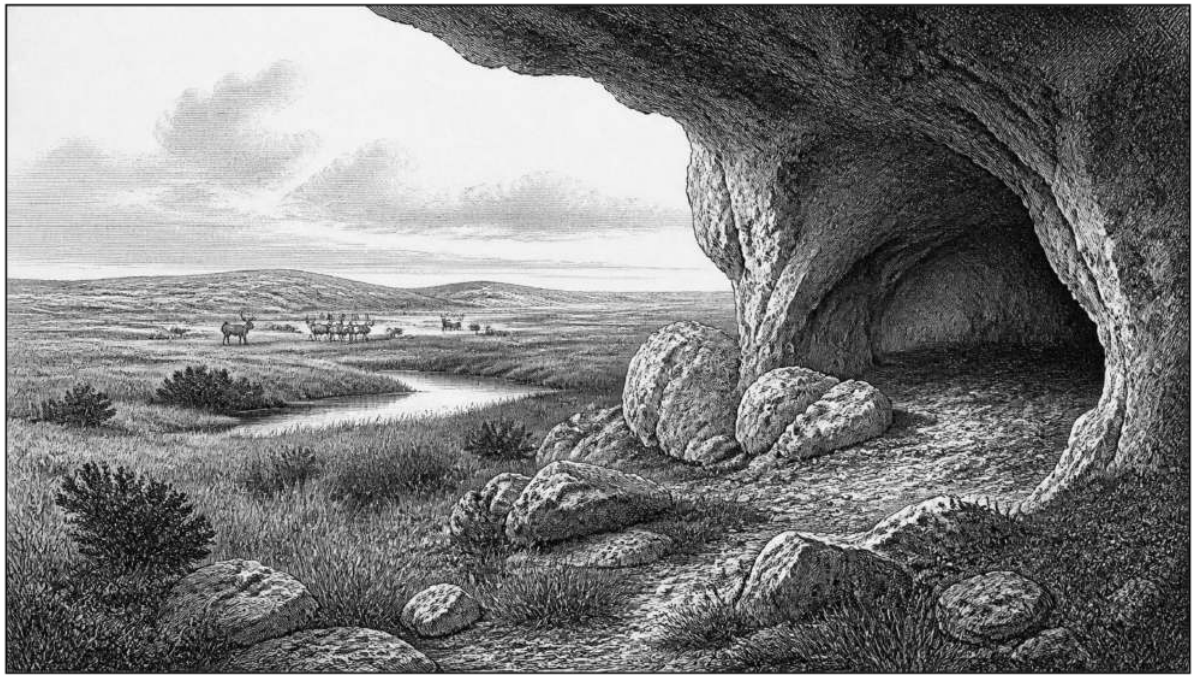
A Record of Survival

Derryvree’s seedbed and Castlepook’s bones preserve two fragile kinds of evidence from a world later glaciers largely erased. Together they show that Ireland around the broad timescale denoted by 31,296 BCE was neither the green, forested island of popular imagination nor an unchanging blanket of ice. It was a variable northern environment, locally open and wet, visited or occupied by Ice Age animals and perhaps, fleetingly, by people. Its historical value lies precisely in that restraint: the evidence is slight, difficult and incomplete, but it is real enough to reveal a far deeper Irish past than written history can reach.

Chapter 006 of 100

31295 BCE

Doneraile’s Hyena Country [6]



Modern calendar-year precision is not available for Ireland at this depth of time. “31,295 BCE” is a convenient modern label, roughly corresponding to 33,244 years before AD 1950, rather than a date on which an Irish event can be placed. No written record, annual chronology, named individual or contemporary political community exists. The responsible approach is to place the notional year within a broader Late Pleistocene interval: the Middle Midlandian in Irish usage, broadly within Marine Isotope Stage 3, before the fullest growth of the last British-Irish Ice Sheet. The evidence consists chiefly of buried sediments, fossil animals, cave deposits and radiocarbon measurements with substantial uncertainty.

A Date Without a Chronicle

Radiocarbon ages are not themselves calendar dates. They must be calibrated against changing concentrations of atmospheric carbon-14, and the uncertainty grows markedly in the period around 33,000 calendar years ago. A deposit may also represent centuries or longer, rather than a single moment. For that reason, it would be misleading to say that a particular herd crossed Ireland, a glacier advanced, or people arrived in the exact year 31,295 BCE. It is more defensible to discuss the environmental world that may be illuminated by dated evidence spanning approximately 36,900–31,700 calibrated years BP at Derryvree in County Fermanagh, and by the wider pre-Last Glacial Maximum faunal record.

That distinction matters especially because later ice repeatedly eroded and rearranged Ireland’s older landscapes. The island has not yielded a continuous Palaeolithic settlement sequence comparable with those of France, Iberia or central Europe. What survives is fragmentary: a wetland trapped beneath glacial

deposits in Fermanagh, animal bones recovered from caves in Cork and elsewhere, and a handful of objects whose meanings remain under examination. These remains provide remarkable evidence for life on the north-western edge of Europe, but not a conventional national history.

Derryvree’s Buried Wetland

The clearest Irish environmental window close to this broad horizon was exposed during roadworks in 1969 at Derryvree, near Maguiresbridge in County Fermanagh. Workers cut through a drumlin, a streamlined hill formed beneath moving ice, revealing fine sands, silts and organic-rich sediment sealed between two distinct tills. Till is unsorted material left by glacier ice. The sequence therefore records a profound alternation: glaciation, a period in which freshwater sediments accumulated in an ice-free locality, and a later glacial advance that buried the wetland.

Organic material from the Derryvree deposit produced the conventional radiocarbon determination BIRM-166, 30,500 radiocarbon years BP, with an uncertainty of roughly a millennium. Calibration permits a broad calendar range, not a precise historical date. Nevertheless, the stratigraphy is decisive evidence that at least part of inland northern Ireland was not continuously overridden by ice during this portion of the last glacial cycle. It also warns against imagining the country as either wholly frozen or wholly hospitable: the conditions changed greatly through time and varied between regions.

The Derryvree flora and fauna point to an open, cold and periglacial landscape. Periglacial describes ground affected by severe cold, frost and thaw near an ice margin; it does not mean that the site itself lay beneath a glacier. Pollen, plant macrofossils, mosses and invertebrate remains indicate sparse tundra-like vegetation, wet hollows and shallow freshwater. Sedges, grasses, herbs and mosses were more important than trees. Arctic-alpine plants and low shrubs could exploit sheltered or damp patches, while short growing seasons and winter cold constrained the landscape. Occasional tree pollen is not proof of a local forest: it may have travelled far or been redeposited.

Open Ground and Unstable Climate

In the wider North Atlantic, Marine Isotope Stage 3 was climatically unstable. Greenland ice cores record abrupt shifts between relatively milder interstadials and colder stadials, although it is not safe to assign the Derryvree silts to a single named Greenland event or to transpose Greenland temperatures directly to Fermanagh. The useful conclusion is more modest: Ireland’s climate did not progress smoothly towards maximum glaciation. Cold, biologically active terrain could exist between episodes of expanding ice, and its vegetation and animal populations would have responded to changing snow cover, growing seasons, sea level and routes of access.

Sea level was much lower than today because enormous quantities of water were stored in ice sheets. Ireland’s coastline was consequently very different, with broader coastal plains in places and narrower or altered sea crossings. Yet lower sea level did not automatically make Ireland a simple extension of Britain or continental Europe. The position, width and nature of land connections altered over the glacial cycle, while glacier ice and cold seas could make movement difficult. Mammals clearly reached Ireland at several points in the Pleistocene, but each arrival needs to be demonstrated from the evidence rather than assumed from a map.

The Cave Record at Castlepook

Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork is the principal Irish archive for large mammals before the Last Glacial Maximum. Excavations in the early twentieth century recovered more than 2,000 bones from its passages and chambers, including places named Hyenahall and Elephant Hall. The National Museum of Ireland holds important material from those investigations. Later radiocarbon work and renewed excavations have reinforced the cave's importance while also demonstrating its difficulty: water movement, disturbance and the collection methods of an earlier era mean that the deposits cannot be treated as one undisturbed occupation floor.

The assemblage documents a far richer Irish Ice Age fauna than survives on the island now. Identifications include woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyena. Not every species need have occupied Castlepook at exactly the same time, and a bone from a cave does not necessarily indicate an animal that died there. Carnivores could carry prey or scavenged remains into a den; water could redistribute bones; and deposits of different ages could become mixed. Still, the total record securely establishes that varied cold-stage mammals reached Ireland during the wider interval before and into the approach to the glacial maximum.

The spotted hyena is particularly striking. Its Irish fossil record is centred on Castlepook, where skulls, teeth, bones and coprolites suggest that the cave was at least sometimes used by these powerful scavengers and hunters. Their presence helps explain why a cave could become a repository of animal remains without requiring human hunters to have made every accumulation. Wolves, bears and foxes likewise belonged to an ecosystem in which carcasses were contested resources. A reindeer or mammoth bone is evidence of an animal population and landscape, not automatically of human subsistence.

The Reindeer Femur Question

A reindeer femur from Castlepook has made this period unusually important for Irish archaeology. Zooarchaeologist Ruth Carden identified a deep incision on the bone as consistent with modification of fresh bone by a sharp stone implement, perhaps in butchery. County Cork's heritage publication associates the specimen with about 31,000 BCE. If the mark was made by people shortly after the animal's death, it would be evidence for a brief Upper Palaeolithic human presence in Ireland far earlier than the long-established terminal Pleistocene evidence from County Clare.

That possibility deserves attention, but not exaggeration. A direct date on a bone dates the animal, not necessarily the act that marked it. The specimen derives from an old cave collection rather than a newly excavated, sealed context, and no securely associated stone-tool assemblage, hearth, house floor, burial, human bone or repeated occupation surface of comparable age has yet been found in Ireland. The most cautious reading is that the femur may record the processing of one animal by visiting people. It cannot demonstrate a resident population, a seasonal camp, a family group or a permanent colonisation of the island.

What Cannot Be Recovered

There is consequently no evidence from around this horizon for political institutions, rulers, territories, diplomacy, organised warfare or formal alliances in Ireland. Nor can archaeology identify language, ethnicity or an Irish identity. “Ireland”, “Cork” and “Fermanagh” are modern geographical terms used to locate ancient evidence, not names known to its makers or inhabitants. A possible butchered reindeer bone does not reveal who held authority, how food was shared, whether groups returned annually, or how they related to communities in Britain or continental Europe.

The same restraint applies to religion, culture and learning. No shrine, grave, figurative art, musical instrument, ornament or inscribed object can be securely assigned to Ireland around 31,295 BCE. Upper Palaeolithic communities elsewhere in Europe possessed complex technologies, social knowledge and symbolic practices, but importing cave art, named archaeological cultures or ritual systems from France into Ireland would convert analogy into false Irish evidence. If people did visit Castlepook, they must have carried practical environmental knowledge, hunting skills and social traditions; the content of that knowledge is beyond recovery here.

Economy at the Edge of Ice

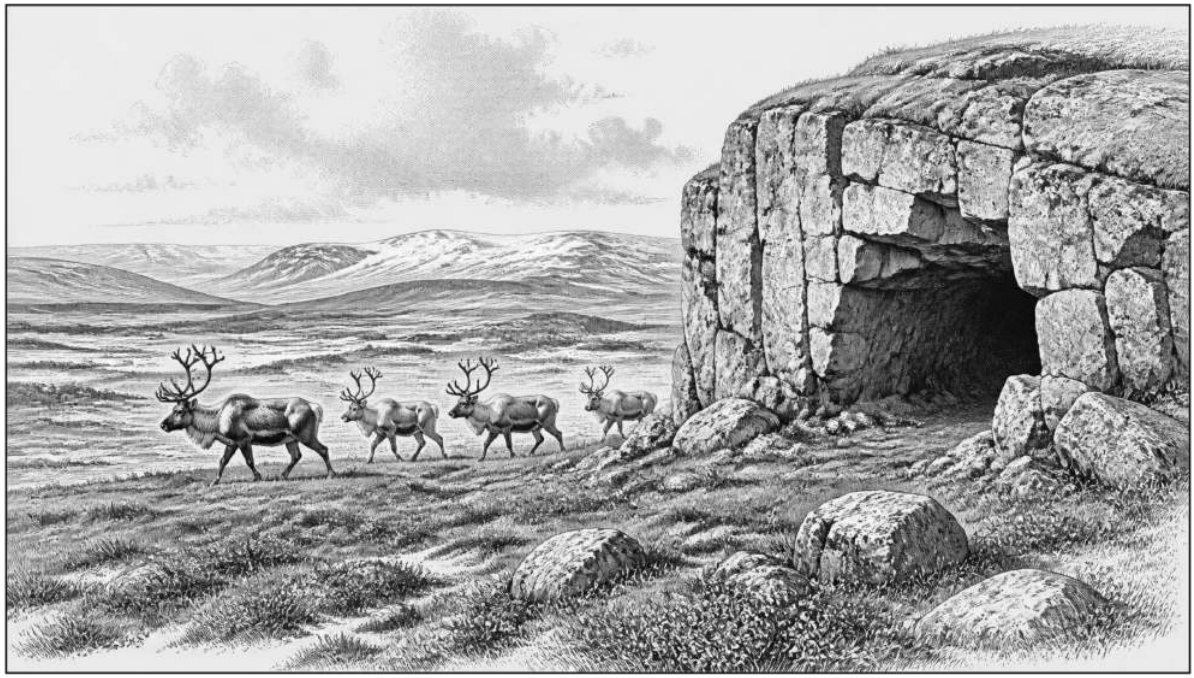
The economy most securely visible is ecological rather than human. Wetland plants used shallow water and damp ground at Derryvree; grazing mammals and their predators moved through open country in other Irish localities; caves became dens, traps or repositories. Reindeer were adapted to cold open environments and may have travelled seasonally, while mammoth and giant deer indicate the availability, at least intermittently, of substantial forage across a broad landscape. These animals were not the familiar inhabitants of later wooded Ireland. Their presence belongs to a colder world in which open vegetation, strong seasonality and glacial instability shaped the possibilities of life.

There is no evidence for farming, herding, settled villages, pottery, metalworking, long-distance commerce or managed fields. If the Castlepook cut mark proves human, the relevant activity was mobile foraging and carcass processing, not a documented trading economy. A small travelling party might have used stone tools, shared meat and moved on; equally, the available evidence cannot establish the size, duration or frequency of any such visits. The strongest historical development is therefore environmental: before later ice-sheet expansion transformed much of the island, parts of Ireland supported cold-adapted plants and animals, and perhaps fleeting human visitors, on a changing Atlantic frontier.

Chapter 007 of 100

31294 BCE

Doneraile’s Palaeolithic Question [7]



The label 31,294 BCE is not a year that can be recovered from Ireland’s archaeological record. No calendar, written account or dated occupation surface permits events to be fixed to that modern year. In conventional arithmetic it points to roughly 33,243 years before AD 1950, the reference point used for ‘BP’ dates, but that conversion is only a chronological signpost. Radiocarbon results require calibration and normally yield ranges rather than a single year; deposits may also contain material accumulated over long periods. The responsible subject is therefore Ireland in the later part of Marine Isotope Stage 3 (MIS 3), broadly around 33,000 calibrated years ago, rather than an imagined episode on a particular day.

An Island in a Changing Ice Age

This was a cold phase of the Late Pleistocene, but it was not yet the uniform, island-wide maximum of the last British–Irish Ice Sheet. The fullest expansion of that ice sheet belongs principally to later millennia. Recent reconstructions show particularly rapid growth after about 31,000 years BP, with ice dynamics varying greatly by region and with no single moment when every sector reached a maximum together. At the date represented by 31,294 BCE, it is unsafe to draw an exact ice margin across Ireland or to describe every district as either habitable ground or permanent ice.

That uncertainty matters because Ireland’s geography was being remade. Colder global conditions lowered sea level and enlarged the continental shelves now submerged around the island. Coastlines, estuaries and passages were consequently unlike those of today. Yet lower seas do not by themselves demonstrate a continuous land bridge, a particular route from Britain, or a human crossing. The evidence supports changing land-and-sea configurations in north-west Europe; it does not supply a map of a journey to Ireland at this exact point.

The terrain available between and beyond ice masses was likely a harsh, open mosaic rather than the wooded Ireland familiar today: grasslands and herb-rich ground, patches of sparse shrub vegetation, exposed mineral soils, wetlands and river corridors. Such reconstructions combine animal remains, plant and insect evidence from Irish Quaternary sequences, and wider north-west European palaeoenvironmental records. They are useful models of the habitat, not photographs of a single Irish valley in 31,294 BCE. Weather and seasons could have shifted sharply, while the survival of evidence has been reduced by later glacial erosion, water movement and the great age of the deposits.

Castlepook Cave’s Long Archive

The strongest Irish evidence close to this broad horizon comes from Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, in north County Cork. Beneath lowland farmland near Doneraile, its limestone passages preserved one of Ireland’s most important collections of Pleistocene vertebrate remains. Early twentieth-century excavators named chambers such as Hyenahall and Elephant Hall; their discoveries eventually entered the National Museum of Ireland. Modern assessment has made Castlepook central not because it offers a neat prehistoric campsite, but because it records the repeated presence of animals before the Last Glacial Maximum.

The cave’s fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, while other deposits include wolf, Arctic fox, mountain hare and lemmings. This assemblage establishes that Ireland was at intervals part of a wider northern European ecological world in which large grazers and browsers, scavengers and predators could reach the island. Spotted hyena is especially striking: Castlepook is Ireland’s key evidence for the species. Its presence also explains why a cave full of bones must not automatically be treated as a human larder. Hyenas could carry carcass parts into dens, gnaw them, and contribute to bone accumulations alongside natural deaths, falls, water transport and later disturbance.

Dates from Castlepook span a very long interval. Geological Survey Ireland summarises radiocarbon evidence for individual bones between about 45,700 and 19,950 BP, while re-dating has shown that some earlier determinations were substantially too young. A 2020 reassessment placed parts of the southern Irish fauna securely in MIS 3 and suggested that giant deer and spotted hyena may have disappeared locally before roughly 40,000 calibrated years BP. Such ranges are more informative than pretending that mammoths, reindeer and hyenas all stood together outside the cave in one nominated year. The fossils show a changing fauna over thousands of years, not a single momentary census.

The Reindeer Femur

One object gives 31,294 BCE particular importance: a fragment of reindeer femur from Castlepook, publicised by zooarchaeologist Ruth Carden and County Cork heritage publications as dating to about 31,000 BC. It bears a deep linear mark interpreted as having been made on fresh bone by a sharp stone tool during carcass processing. If that diagnosis is sustained, it is remarkable evidence that people handled a reindeer in Ireland during the Upper Palaeolithic, long before the well-established Mesolithic settlement record after the final retreat of the ice.

Its limits are as important as its promise. The dated bone is evidence for the age of the animal; the interpretation of the mark as a tool cut is a separate taphonomic judgement. Nor does one modified femur establish where the animal was killed, whether people entered the cave, how many individuals were involved, or whether they lived in Ireland year-round. A butchered remnant could have been left

elsewhere before a scavenger or other natural process brought it into the cave. No securely associated stone-tool assemblage, hearth, dwelling, burial, human bone or repeatedly occupied surface of comparable age has been recovered in Ireland.

Accordingly, the phrase ‘human activity’ is safer than ‘settlement’. It allows for a brief visit by mobile foragers without turning a fragmentary trace into a village, a population or an origin story. In Upper Palaeolithic Europe beyond Ireland, people made sophisticated stone tools, practised varied hunting strategies and created symbolic works. None of those cultural achievements can responsibly be assigned to Ireland around this date without Irish artefacts or contexts to support the claim. The Castlepook femur may alter the scale of Ireland’s earliest human history; it does not yet fill in its social detail.

Life Beyond the Evidence

If people did reach Ireland in this period, reindeer would have offered meat, marrow, hide, sinew and bone, resources valuable to highly mobile hunter-gatherers in cold country. That is a reasonable inference from the animal and from comparative Upper Palaeolithic practices, not direct evidence of an Irish camp. There is no basis for describing local households, clothing styles, language, kinship rules, leadership or seasonal meeting places. Equally, there is no evidence for farming, animal husbandry, metalworking, pottery, monuments, permanent fields, formal trade networks or maritime commerce. These belong to vastly later phases of Irish prehistory.

Political affairs, diplomacy and warfare leave no identifiable record at this horizon. It would be anachronistic to imagine tribes, territories or chiefs in the later historic Irish sense. Even the scale of any human presence is unresolved. The better-attested realities are ecological: large animals moved through suitable landscapes; carnivores used caves and competed within food webs; and climatic deterioration was increasingly reshaping the region. Any people present would have faced those conditions rather than governed a recognisable polity.

Religion, art, learning and ritual are likewise beyond direct recovery here. Caves elsewhere in Europe can preserve art, hearths and structured deposits, but Castlepook has not produced comparable evidence securely tied to this period. The cave’s evocative gallery names are modern labels, not signs of prehistoric ceremony. The absence of evidence is partly an archaeological fact and partly a preservation problem: later ice, sediment movement and nineteenth- and twentieth-century excavation practices obscured original relationships between many bones and layers.

What Research Can Still Recover

The history of the evidence is itself consequential. Much of Castlepook was excavated before modern standards of stratigraphic recording, and estimates suggest that many thousands of bones were removed. Surviving material therefore demands cautious re-examination rather than simple repetition of old conclusions. Re-dating programmes, zooarchaeology, microscopic study of surface modifications, ancient biomolecular methods and improved understanding of radiocarbon calibration have already changed the chronology. They demonstrate why a museum drawer or old cave collection can remain scientifically active long after excavation.

Fieldwork in 2022, supported by the Royal Irish Academy and undertaken by a team including Richard Jennings, Helen Lewis, Ruth Carden and Patrick Randolph-Quinney, located surviving cave sediments and areas of Pleistocene potential in Castlepook’s upper system. The project was designed to

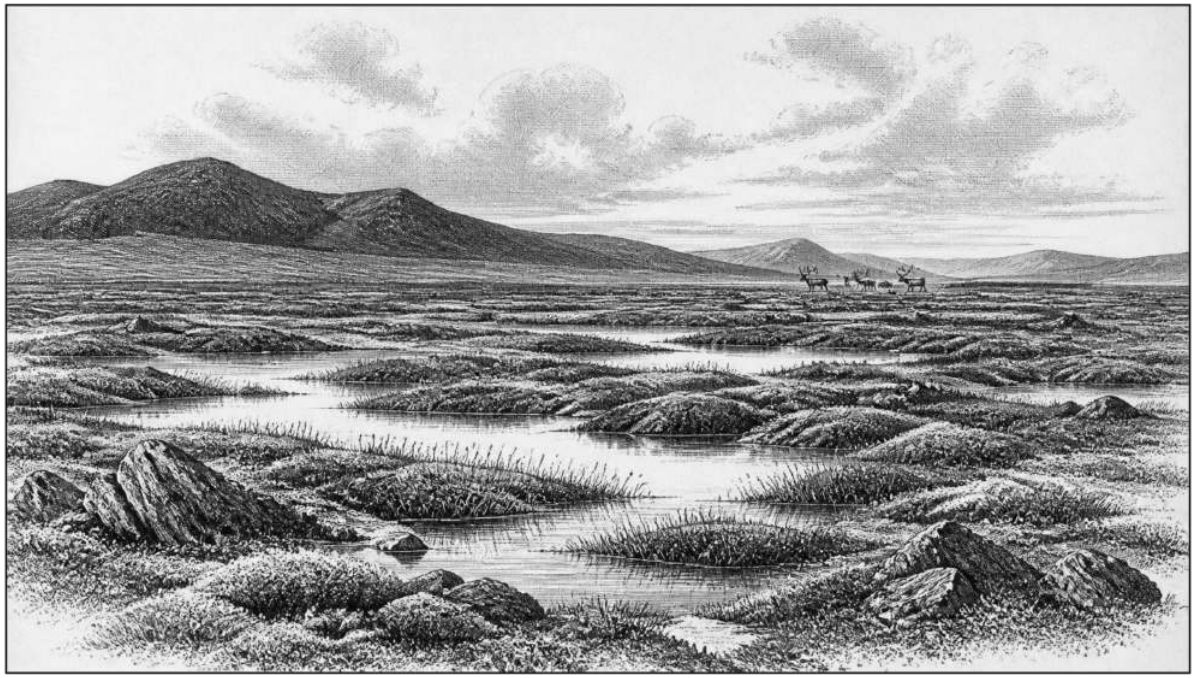
determine whether undisturbed deposits remained after earlier digging. Its importance lies in the possibility of finding securely stratified material: bones with recorded positions, sediments that can reveal how they accumulated, and perhaps artefacts that would test the interpretation of the reindeer femur.

For now, 31,294 BCE should be understood as a point within a deep and uncertain interval. Ireland was experiencing Late Pleistocene environmental change, with cold-adapted fauna documented in the south and expanding ice systems altering the wider archipelago. Castlepook offers powerful proof of that animal world and a tantalising, still limited indication of human contact with it. The proper history of this date is not a fabricated episode of Ice Age Irish life, but the disciplined effort to distinguish a dated bone, a marked surface, a cave formed by carnivores and water, and the larger possibilities they may eventually illuminate.

Chapter 008 of 100

31293 BCE

Fermanagh’s Ice-Free Window [8]



Modern calendar-year precision cannot be applied to this point in Ireland’s past. “31,293 BCE” is a useful modern label, not a date recorded by contemporaries or an archaeological horizon that can be isolated to a single year. In the convention of counting backwards from AD 1950, it falls roughly 33,240 calendar years before present. The evidence available for Ireland belongs instead to broad calibrated ranges, often spanning centuries or millennia. It concerns the later part of Marine Isotope Stage 3, within the Midlandian cold stage: an unstable interval before the fullest expansion of the last British–Irish Ice Sheet. No named event, ruler, community or exact human action can responsibly be assigned to this year.

A Buried Fermanagh Landscape

The closest Irish environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. In 1969, a road cutting through a drumlin exposed freshwater silts and fine sands trapped between two thick layers of glacial sediment. The organic deposit, catalogued as BIRM-166, produced a conventional radiocarbon determination of 30,500 ± 1,100 radiocarbon years BP. Calibrated estimates place its formation broadly within about 36,900–31,700 calendar years BP. That broad interval encompasses the modern label 31,293 BCE, though it emphatically does not prove that the deposit formed in that precise year.

The Derryvree sediments show that southern Fermanagh was ice-free when the freshwater material accumulated. Plant remains, pollen and insect evidence point to an open, cold landscape rather than woodland: a periglacial mosaic of sparse tundra vegetation, wet ground, mosses, sedges and shallow pools. Among the recovered plant macrofossils were species associated with severe northern conditions.

Dry ground may have supported only scattered herbs and dwarf shrubs, while waterlogged hollows sustained richer local plant life. This was not a featureless white wilderness. Even under a cold climate, small differences of drainage, shelter and season created distinct habitats.

That evidence is especially valuable because Ireland’s later ice sheets removed, mixed or buried much older soils and open-air surfaces. A surviving wetland lens beneath a drumlin is therefore an exceptional archive. Yet its lesson has limits. Derryvree illuminates one landscape in what is now County Fermanagh during a dated interval; it cannot supply a weather report for the entire island, still less a chronology of year-by-year changes. The proper conclusion is local but important: parts of Ireland retained cold terrestrial and freshwater environments before being overridden by later ice.

Ice Was Growing Unevenly

At roughly 33,000 calendar years ago, the last glacial cycle was intensifying, but Ireland was not simply an island already sealed beneath one uniform ice cap. Ice-sheet growth across Britain and Ireland was regionally asynchronous. BRITICE-CHRONO research identifies major advance in the north Minch around 32,000–31,000 years ago, while other sectors reached their maximum extent later. Evidence from the continental shelf north-west of Ireland suggests advance to the shelf edge at about 29,000–27,000 calendar years BP; southern and western sectors also have their own histories of advance and retreat.

Accordingly, 31,293 BCE should be understood as a threshold within a long glacial transformation, not as the beginning of the Last Glacial Maximum itself. The maximum ice volume of the British–Irish Ice Sheet came later, around 23,000 years ago, though local margins had different timings. Some uplands may have stood above warm-based erosive ice, or carried cold-based ice that left older surface material comparatively intact; other lowlands were eventually deeply reshaped by moving ice. The drumlins, scoured rock, tills and offshore moraines visible in Ireland today are products of those successive episodes rather than a single frozen moment.

Sea level was far lower than it is now because enormous volumes of water were held in continental ice sheets. Ireland’s connections with Britain and the wider north-west European landmass consequently changed as sea level, ice margins and local topography changed. This helps explain how animals could have reached Ireland during favourable intervals. It does not mean that a single, permanent and easily traversed land bridge existed everywhere, or that any particular route was open in the modern calendar year under discussion. Recent sedimentary ancient-DNA work from Castlepook Cave supports wider Late Pleistocene faunal connectivity, but it remains a preprint and should be treated as developing evidence rather than a final map of migration routes.

Castlepook’s Animal World

The best-known Irish mammal archive for this broad period lies far to the south-west at Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations in the early twentieth century recovered a remarkable collection of bones and teeth. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, Arctic fox, mountain hare, lemmings and spotted hyena. A spotted-hyena skull in the National Museum of Ireland’s collection is a vivid reminder that predators now absent from Ireland once formed part of its Pleistocene fauna.

This is strong evidence that cold-adapted animals reached Ireland during portions of the later Pleistocene. It suggests open country capable of supporting grazing and browsing herbivores, together with carnivores that hunted, scavenged or used caves as dens. Mammoth and reindeer should not,

however, be imagined as a permanently stable “Irish mammoth steppe”. A cave bone accumulation may combine animals brought in by carnivores, animals dying naturally, material moved by water, and finds from deposits of different ages. The original excavations also disturbed contexts and removed much material with recording standards far below those expected today. Castlepook is an indispensable archive, but it is not a single undisturbed campsite or a single season’s kill.

Radiocarbon reassessment has reinforced the need for caution. Earlier measurements on Irish cave bones have sometimes proved misleading when re-tested using improved pretreatment methods, and some Castlepook animals appear to pre-date the full Last Glacial Maximum by a substantial margin. The most defensible use of the site is therefore to establish a broad ecological setting: Ireland supported a more varied large-mammal community during parts of Marine Isotope Stage 3 than its much later fauna would suggest. It cannot demonstrate that every listed species stood together in County Cork in 31,293 BCE.

The Question of People

Castlepook also raises Ireland’s most intriguing human question for this era. A reindeer femur fragment from the cave has been reported as bearing a deep mark interpreted as damage from a stone tool during carcass processing. If that identification and broad age are sustained, it may be evidence that one or more Upper Palaeolithic people handled a reindeer in Ireland around 33,000 years ago. Such a discovery would greatly extend the island’s archaeological human story beyond the later, better-established record.

But a possible cut-marked bone is not a settlement. It does not identify the people involved, establish whether they hunted or scavenged the animal, reveal how many companions were present, or show whether they remained for hours, weeks or generations. No securely associated dwelling surface, hearth, stone-tool assemblage, burial, ornament, art or human bone has yet demonstrated a resident population in Ireland at this date. Nor can an animal-bone date necessarily date the moment at which a mark was made. The evidence permits the possibility of a brief human visit; it does not permit a confident narrative of colonisation.

For that reason, the usual categories of annual history have almost no direct application. There is no evidence from Ireland for political institutions, leaders, territorial states, diplomacy, organised warfare, written learning, religious monuments or trade networks in this period. It would be equally unwarranted to deny that visitors had social relationships, skills, stories or beliefs: people in Upper Palaeolithic Europe certainly possessed complex cultural capacities. The point is evidential. Ireland has not yielded the material record that would allow those capacities to be described here in an Irish setting.

Movement Rather Than Settlement

If people did reach Ireland during this broad interval, their lives were likely shaped by mobility, seasonality and knowledge of animals, weather and terrain. That is an interpretation drawn from the wider Upper Palaeolithic world and from the demanding Irish setting, not a fact documented by an Irish camp. Reindeer could have offered meat, hide, sinew, marrow and bone; caves could have offered shelter or hazards, especially where hyenas and other carnivores used them. But neither hunting strategy nor diet can be reconstructed from the present Irish evidence alone.

The more secure story is one of regional change. Fermanagh’s buried wetlands record an ice-free cold landscape in the north. Castlepook preserves signs of a southern fauna that included both herbivores and formidable predators. Offshore and upland evidence charts an ice sheet expanding unevenly across the

surrounding seas and the island itself. In later millennia, advancing ice would scour and mantle much of the land, alter drainage and eliminate many habitats that had briefly supported this Pleistocene ecosystem.

Thus the Ireland of 31,293 BCE was not yet the familiar green, wooded island of later prehistory, nor can it be described as a settled country. It was a changing northern landscape at the edge of an enlarging ice-sheet system: open tundra and wet hollows in some places, animal corridors in others, and perhaps the scene of a fleeting human encounter whose possible trace survives only as a mark on a reindeer bone. The uncertainty is not a gap to be filled with invention. It is the central historical fact of this deep time.

Chapter 009 of 100

31292 BCE

Doneraile’s Ice-Age Femur [9]



31,292 BCE is a modern numerical label, not a recoverable year in Ireland’s prehistoric record. No contemporary Irish calendar, written account, settlement sequence or annually resolved archaeological layer can identify what happened in that particular year. The responsible approach is therefore to place it within broad, calibrated chronological ranges. It lies roughly 33,242 years before the conventional 1950 ‘present’ used in archaeological dating, within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the last Ice Age. Dates of this antiquity normally carry uncertainties of centuries or millennia; calibration converts radiocarbon measurements into probability ranges rather than exact historical anniversaries.

A Landscape Before the Maximum Ice

Ireland at this point was not the familiar green, wooded island of later millennia. It was part of a cold North Atlantic world in which climate swung repeatedly between relatively milder interstadial episodes and harsher stadials. The great British–Irish Ice Sheet had not yet attained its maximum extent. Current reconstructions place its major growth from about 31,000 years ago, with maximum volume around 23,000 years ago; at the time represented by 31,292 BCE, the island’s environmental history was already moving towards more extensive glaciation, but substantial tracts could still be ice-free.

That does not mean a uniform open plain from Cork to Antrim. Ice margins, frozen ground, wind-blown sediment, rivers, wetlands and local relief created varied conditions. The position of seasonal snow, the duration of summer thaw and the accessibility of valleys could alter sharply over relatively short distances. Nor can modern coastlines be projected backwards uncritically. Sea level was lower than today

because vast volumes of water were stored in ice sheets, but the changing Irish Sea basin, glaciers and channels make it unsafe to imagine a simple, continuous land bridge linking Ireland, Britain and continental Europe. Any route taken by animals or people remains unproven for this particular interval.

Derryvree’s Buried Wetland

The clearest Irish environmental evidence relevant to this broad date comes from Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts and fine sands enclosed between two thick tills: sediments laid down by ice. The organic deposit produced a radiocarbon determination of 30,500 +1,170/−1,030 radiocarbon years BP. Later discussion places its calibrated span broadly around 36,900–31,700 calendar years BP, approximately 34,950–29,750 BCE. This wide range overlaps 31,292 BCE, but it cannot pinpoint that year.

What Derryvree does preserve is a rare local picture of conditions between glacial advances. Plant macrofossils, pollen and insects indicate open, treeless tundra or muskeg: wet ground with pools, mosses, sedges, grasses, dwarf shrubs and herbs rather than forest. Fossils include plants associated with cold climates, among them bogbean, mountain-avens, Arctic willow and rosy saxifrage. Beetle evidence supports a periglacial wetland with standing water and decaying plant matter. This was not lifeless frozen desert. It was a severe but productive mosaic in which liquid water persisted locally during the growing season.

The distinction matters. Derryvree is evidence for a particular northern Irish deposit, not a complete map of all Ireland, and its plants do not yield a precise mean temperature for 31,292 BCE. Yet it firmly overturns any picture of an island wholly sealed under ice or ecologically blank. At least during the formation of these sediments, northern Ireland had an exposed landscape capable of supporting wetland vegetation, insects and herbivores. The later upper till demonstrates how vulnerable such habitats were: a renewed advance buried and preserved them beneath glacial sediment.

Castlepook’s Animal Archive

In the south, Castlepook Cave near Doneraile, County Cork—also called Mammoth Cave—provides Ireland’s most important pre-Last Glacial Maximum animal archive. Antiquarian excavations recovered large quantities of bone from its passages in the early twentieth century. The collection includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Such a list evokes an unfamiliar Ireland, one connected ecologically with the cold-stage fauna of north-west Europe.

It would nevertheless be wrong to turn that list into a single dramatic scene set in 31,292 BCE. Castle deposits accumulated through many processes and over long periods. Carnivores could carry bones into caves; animals could die in fissures; water could move material; and early excavation methods did not preserve the detailed stratigraphic context expected today. Some specimens are demonstrably of different ages. Improved ultrafiltration and radiocarbon methods have also shown that several older Irish cave dates needed reassessment, pushing parts of the Castlepook fauna farther back into MIS 3. The cave is therefore an archive of recurring animal presence and changing conditions, not a sealed one-day hunting camp.

Even with those cautions, the fauna is historically important. Reindeer and lemmings indicate cold, open country; mammoths and giant deer suggest substantial grazing landscapes; wolves, bears and hyaenas show that large carnivores occupied or ranged through the same wider world. Spotted hyaena is especially striking because Castlepook is Ireland’s key locality for the species. Hyaenas are not evidence

of an African-type climate: Late Pleistocene spotted hyaenas were part of European cold-stage ecosystems. Their denning and scavenging behaviour may itself explain why portions of the bone collection came to rest underground.

The Reindeer Femur

The one object that makes this period particularly consequential for Irish human history is a fragment of reindeer femur from Castlepook. Re-examination of the bone identified a deep surface incision interpreted by zoologist Ruth Carden as a cut made with a sharp stone tool while fresh tissue was still present. Public heritage interpretation has placed the find at about 31,000 BCE, broadly close to the date considered here. If that diagnosis is sustained, it would indicate that at least one person processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for human activity on the island.

But the wording ‘if’ is essential. A radiocarbon result dates the death of the animal, not automatically the moment when a mark was made, the place where butchery occurred, or the identity of the maker. The bone came from a disturbed cave collection rather than a secure, excavated occupation surface. There is no stone-tool assemblage, hearth, dwelling, human burial or repeated processing floor from Ireland of comparable age. The 2022 Castlepook Caves Project recovered animal bones and investigated surviving deposits, but it did not establish a Palaeolithic cultural layer or artefact assemblage.

The careful conclusion is modest but significant. Castlepook offers possible evidence of human handling of a reindeer, not proof of a permanent population, village, named people or established hunting territory. A carcass could have been processed in the open and a discarded element later drawn into the cave by scavengers. Equally, an ephemeral visit by a small mobile party could leave only such a fragmentary trace, especially in a landscape later altered by advancing ice, erosion and rising seas. The absence of a camp is not proof that no one came; nor does one marked bone demonstrate sustained settlement.

People Without Polities

For conventional political history, 31,292 BCE is silent. There were no identifiable Irish states, rulers, borders, diplomatic missions or wars in the evidence. Nor can archaeology responsibly assign any possible visitors to an Aurignacian, Gravettian or other named continental tradition, because Ireland has not produced diagnostic toolkits from this time. Continental Upper Palaeolithic communities certainly possessed sophisticated knowledge of stone-working, clothing, fire, hunting and long-distance social connections, but those broader European facts cannot simply be imported to Ireland as local evidence.

The same restraint applies to religion, culture and learning. No Irish cave art, portable art, grave, ritual deposit, musical instrument, personal ornament or symbolic object can presently be dated to around 31,292 BCE. There is consequently no basis for describing beliefs, languages, kinship systems or ceremonies. If people were present, their practical knowledge would have been formidable: reading animal movement, locating fuel and shelter, managing cold exposure and navigating a changing terrain. Yet this is an inference from survival requirements and comparative Upper Palaeolithic evidence, not a directly observed Irish social world.

Subsistence, Movement and Loss

No economy in the later sense can be reconstructed. There were no farms, fields, livestock, metalworking or documented trade networks. The plausible resources in a cold open landscape included reindeer meat, marrow, hide, sinew, antler and bone, alongside smaller animals and wetland plants, but Castlepook cannot establish which materials were used or whether its reindeer was hunted rather than scavenged. A single bone does not reveal seasonal rounds, exchange relationships or population size.

What can be said is that Ireland lay on a shifting north-western edge of humanly habitable territory. Its animal record shows that cold-adapted mammals reached the island during MIS 3. Its buried sediments show that some landscapes supported plant and insect communities between episodes of ice expansion. Its possible human trace suggests that people may have entered that world too. Subsequent glaciation would reshape the land and severely reduce the chance that open-air camps survived. The historical importance of 31,292 BCE therefore lies not in a named event but in a threshold: Ireland was an intermittently viable Ice Age landscape, with the faint possibility that human visitors briefly shared it with reindeer, mammoths and hyaenas.

Chapter 010 of 100

31291 BCE

Fermanagh’s Sedge Marsh [10]



Modern calendar-year precision is not available for Ireland in 31,291 BCE. The number is best treated as a modern point within a much broader prehistoric timescale: approximately 33,240 calibrated years before present (cal BP, where “present” is conventionally 1950). Archaeology and palaeoenvironmental science can sometimes date deposits to ranges spanning centuries or millennia, but cannot identify an event occurring in this particular year. Around this point Ireland belonged to Marine Isotope Stage 3, a long, climatically unstable part of the Late Pleistocene before the Last Glacial Maximum. The most responsible history is therefore one of landscapes, animals, sediments and the severe limits of the evidence, rather than named peoples or year-specific happenings.

An Island in a Cold Interval

At roughly 33.2 thousand cal BP, Ireland was not the continuously ice-covered country it would become nearer the Last Glacial Maximum. Yet neither was it a mild or wooded island resembling later prehistoric Ireland. Temperatures and ice margins changed repeatedly across north-west Europe. The expanding British–Irish Ice Sheet was a major force in the region, but its fullest late-glacial extent came later, conventionally placed around 27,000–23,000 cal BP. Reconstructions differ over the precise timing and reach of earlier ice advances, especially because later glaciers eroded or buried much of the older record. What can safely be said is that Ireland contained ice-free ground during parts of this earlier cold phase, alongside glacial and periglacial environments, and that conditions could alter markedly over comparatively short geological timescales.

Sea level was substantially lower than today because enormous quantities of water were held in continental ice sheets. Ireland’s coastlines and surrounding shallow seas consequently looked very different. The present Irish Sea, Celtic Sea and Atlantic shelf were altered landscapes of exposed ground,

ice, rivers, lakes and changing shorelines. Low sea level did not automatically create a simple, enduring land bridge from Ireland to Britain or the European mainland. Ice, water depth, local crustal movement and the shape of the sea floor all mattered. Animal arrival must therefore be inferred from fossil distributions and palaeogeography, not assumed from a neat map of one permanent corridor.

The Fermanagh Record

One of the most illuminating Irish environmental archives for this broad period lies beneath glacial deposits at Derryvree near Maguiresbridge, County Fermanagh. There, organic-rich silts and fine sands occur between tills: material laid down in freshwater conditions, later sealed beneath another phase of ice-related deposition. A radiocarbon determination from the sequence has been calibrated to about 36.9–31.7 thousand cal BP. That is a wide range, but it encompasses the modern date-label 31,291 BCE. The deposit cannot tell us what happened in one year; it can provide a defensible view of the kinds of environment present during an interval that includes it.

Plant macrofossils, pollen and insect remains from such deposits point to open, cold-country vegetation rather than forest. Sedges, grasses, mosses and herbs formed a sparse but varied cover around wet hollows and shallow water. Recorded taxa include plants now associated with northern, alpine or tundra settings, such as mountain-avens, dwarf willow, Arctic water-milfoil and bogbean. Their presence does not mean that every part of Ireland was identical. It means that a freshwater wetland in south Fermanagh supported cold-adapted communities, with sufficient summer thaw and liquid water for pools, marsh plants and insects. A treeless landscape was not lifeless: it was a mosaic of wet ground, exposed mineral soil, low vegetation and seasonally changing waters.

This evidence is particularly valuable because it is local and stratified. Fossil plants derive from a defined sedimentary setting, rather than from a general impression of what an Ice Age landscape “ought” to have contained. Even so, interpretation needs care. Pollen may travel far; seeds and beetles represent particular habitats; and a buried basin records its catchment rather than all Ireland. Derryvree offers a window onto a cold freshwater landscape, not a complete national census. Its importance lies precisely in showing that, between episodes of glaciation, some Irish ground could sustain complex wetland life.

Caves and a Changing Fauna

County Cork’s Castlepook Cave, near Doneraile and also known as Mammoth Cave, supplies the principal Irish evidence for larger animals before the Last Glacial Maximum. Its early twentieth-century excavations recovered thousands of bones and teeth from a maze of limestone passages. Reassessment using improved radiocarbon methods has demonstrated that several old determinations were too young, while also reinforcing a basic conclusion: mammals reached Ireland in Marine Isotope Stage 3, broadly between at least 45,000 and 20,000 years ago. Castlepook’s deposits include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, stoat, collared lemming and Norwegian lemming, as well as spotted hyena.

Those animals should not be imagined as one perfectly synchronous herd gathered at a single Irish moment. A cave deposit is a time-averaged archive. Carnivores may have dragged prey in; scavengers gnawed bones; water shifted material; and the nineteenth- and early twentieth-century excavations did not always record layers to modern standards. Some taxa may belong to different centuries, millennia or climatic episodes. Nevertheless, the assemblage establishes an important regional fact: Ice Age Ireland

intermittently supported a fauna capable of living in open, cold environments. Reindeer and lemmings accord with tundra-like conditions; mammoth and giant deer point to extensive grazing country; wolves, bears and hyenas indicate a food web with substantial prey and competition.

Spotted hyena is especially striking because it is absent from modern Europe outside captivity and is known in Ireland principally from Castlepook. The cave was evidently more than a passive trap: hyenas could use sheltered chambers as dens or feeding places, helping to explain accumulations of broken and gnawed bone. That is evidence for animal behaviour, not for an Irish human camp. Likewise, the evocative chamber names bestowed by earlier investigators – including Elephant Hall and Hyenahall – describe the character of fossil finds, not ancient places with recorded inhabitants or events.

People: A Possibility, Not a Narrative

There is no securely dated settlement, hearth, stone-tool assemblage, burial or dwelling in Ireland that permits a confident account of human society in 31,291 BCE. No polity, leader, language, religious system, trade network or diplomatic relationship can responsibly be assigned to this date. The familiar categories of political affairs, warfare, social rank and organised religion belong to later evidence, not to this sparse Pleistocene record.

A reindeer bone from Castlepook has been reported as carrying a deep linear mark interpreted as a possible stone-tool cut made during butchery, and has been associated in public discussion with an age of around 33,000 years. If that interpretation and association are sustained by further work, it would indicate a fleeting Upper Palaeolithic human presence in Ireland much earlier than once accepted. It would not demonstrate permanent colonisation, a named cultural group, or a community living in the cave. The specimen comes from an old and complicated faunal archive; distinguishing a human cut from damage produced by excavation, transport, carnivores or natural processes requires microscopic study, secure provenance and direct dating wherever possible. The cautious conclusion is that human visitation is a research question of great importance, not a settled narrative for this year.

Life Without a Recorded Society

If people did reach Ireland during this interval, they would have entered a harsh, sparsely populated environment where mobility, shelter, fire, clothing and knowledge of animal movements were matters of survival. That is an inference drawn from the climate and wider Upper Palaeolithic world, not direct evidence from an excavated Irish camp. Ireland’s actual record at this date documents animals and habitats far more securely than it documents humans. There is no evidence for farming, pottery, metalworking, long-distance exchange in objects, monument building, formal cemeteries or literacy. The economy, in the only sense supported by evidence, was ecological: plants captured a brief growing season; herbivores grazed and moved; predators and scavengers followed opportunities; and water, frost and ice repeatedly rearranged the ground.

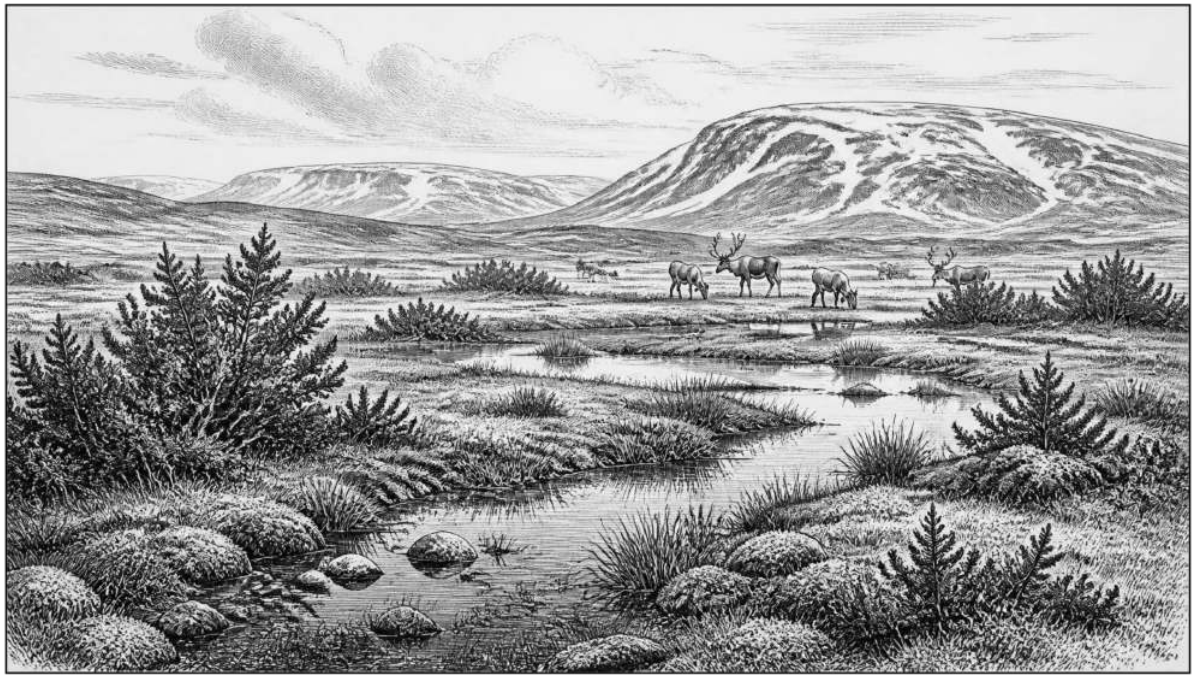
Regional change was the dominant historical process. In Fermanagh, marshes and pools could preserve a cold-climate flora during an ice-free interval. In north Cork, caves accumulated the remains of a distinctive large-mammal fauna over a long span. Across the island, later ice advances would scour landscapes, redeposit sediment and obliterate many traces that people or animals may once have left. This destructive history explains why absence of evidence cannot simply be treated as proof of an empty island. It also explains why a single cave bone or a narrow band of organic silt carries unusual weight.

For 31,291 BCE, then, Ireland’s history is not a chronicle of tribes or events. It is the history of a cold, changeable north Atlantic landscape: freshwater sedge marshes in Fermanagh; open grazing country and limestone refuges in Cork; mammals arriving, feeding, denning and dying; and a possible but unconfirmed human trace at the edge of the archaeological record. The evidence is fragmentary, but it reveals an Ireland already shaped by climatic volatility long before the later ice sheet and long before enduring human settlement.

Chapter 011 of 100

31290 BCE

Derryvree Beneath Renewed Ice [11]



The label 31,290 BCE cannot responsibly be treated as a dated year in Irish history. It corresponds approximately to 33,239 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the last glacial cycle. No Irish document, settlement sequence or archaeological layer can be assigned to this particular calendar year. The evidence instead permits a carefully bounded account of an interval: an Ireland of cold open ground, freshwater hollows, roaming large mammals and changing ice margins, known through sediments, fossil remains and cave deposits.

The most informative Irish site for this broad horizon is Derryvree, near Maguiresbridge in County Fermanagh. In 1969, roadworks cut through a drumlin and exposed fine sands, freshwater silts and organic material trapped between two substantial bodies of till, the unsorted debris deposited by glacier ice. The sequence is important because its order is clear. Ice had crossed the locality and left the lower till; subsequently, water, sediment and plant material accumulated; later glacial activity covered the deposit with a second till. Derryvree is therefore evidence for major environmental change, not a snapshot of a single season or year.

A Broad Dating Window

Organic material from the Derryvree deposits produced radiocarbon determination BIRM-166: 30,500 radiocarbon years before present, with a considerable laboratory uncertainty of +1,170 and −1,030 years. Radiocarbon ages are not calendar ages. The amount of atmospheric carbon-14 has changed through time, so results must be calibrated using internationally maintained curves. At more than 30,000

years ago, calibration has wide uncertainty ranges and depends on several independently dated archives. Scholarship accordingly places the Derryvree deposit broadly within later MIS 3, with calibrated estimates spanning roughly 36,900 to 31,700 calendar years before present.

31,290 BCE falls within that wide calibrated interval, but it cannot be pinned to an individual Derryvree bed, an animal visit or a human action. Its value is as a point within a dated environmental horizon. This distinction matters especially in Ice Age Ireland, where later glaciers eroded, redeposited or buried vast quantities of earlier evidence. The archaeological record is exceptionally thin not necessarily because nothing occurred, but because the island's subsequent glacial history was highly destructive to exposed landscapes.

Water Between the Tills

Derryvree contradicts any simple picture of an island locked continuously beneath an unbroken ice sheet. Its freshwater sediments show that, during part of the last glacial cycle, this Fermanagh locality was ice-free enough for standing or slow-moving water and organic material to accumulate. The fossil evidence points to a periglacial setting: a harsh landscape shaped by prolonged frost, thaw, saturated ground and a short but biologically productive growing season. It was not a modern peatland, forest or farmed countryside.

Pollen, plant macrofossils, mosses and insects recovered from the deposit indicate open tundra or muskeg. Grasses, sedges, herbs and juniper formed much of the terrestrial vegetation, while wet places supported aquatic and marsh plants. A fossil seed of bogbean, *Menyanthes trifoliata*, is particularly evocative. Bogbean needs freshwater conditions; its presence confirms that cold did not mean a wholly dry, lifeless surface. Mossy margins, shallow pools and plant-rich watercourses could sustain insects and small animals even where woodland was absent.

The evidence supports local ecological variety rather than a uniform plain. Low hollows could collect meltwater and sediment; slightly better-drained ridges might carry sparse grass and herb cover; exposed ground would have been vulnerable to wind and frost. Winters were severe, and frozen soil may have restricted drainage, but summer sunlight could briefly energise vegetation. Such mosaics are significant because they created forage and shelter for animals and, potentially, for any people moving through the region.

Ice, Climate and Changing Geography

This was not yet the Last Glacial Maximum, when the British–Irish Ice Sheet later expanded to its greatest extent, chiefly between about 27,000 and 23,000 calendar years ago in different sectors. Reconstructions of the sheet's growth remain under refinement, and Ireland was not necessarily covered in the same way at the same time. Derryvree's inter-till sequence is direct local evidence that ice conditions had changed before the later advance which sealed its freshwater archive.

South-west Ireland offers a complementary, though different, climate record. At Crag Cave in County Kerry, uranium-thorium dating shows that stalagmites grew episodically during MIS 3. Stalagmite growth requires liquid water moving through rock and cave passages, so these episodes indicate intervals when local mean annual conditions were sufficiently mild for that circulation. They do not prove that every district was warm, wooded or hospitable, but they demonstrate that the Irish climate responded sharply to the millennial-scale swings recorded across the North Atlantic.

Sea level was far lower than today because so much water was stored in continental ice. Ireland’s coasts and the surrounding shelf therefore had a different shape, and the Irish Sea was not the fixed maritime barrier familiar in the modern world. Yet it would be wrong to turn this into a simple land-bridge story. Ice, rivers, marine channels, shifting shorelines and seasonal conditions all affected movement. Fossils establish that animals reached Ireland during portions of this wider period; they do not identify a single route, date or crossing.

The Castlepook Fauna

For animal life near this broad timescale, Castlepook Cave in County Cork is indispensable. Excavated principally in the early twentieth century, it has yielded more than 2,000 bones and is Ireland’s richest known cave archive for fauna from before the Last Glacial Maximum. Its deposits include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared and Norwegian lemmings, and spotted hyaena. This was a recognisably north-west European Ice Age fauna, but one represented in Ireland by a small and complicated survival.

The assemblage should not be imagined as a single herd gathered on one day. Cave sediments were disturbed by water, earlier excavations removed much of the original stratigraphy, and bones from different periods may have become mixed. Radiocarbon programmes have substantially revised the chronology of some specimens, demonstrating both the importance of modern pretreatment methods and the fragility of older assumptions. Geological Survey Ireland describes dates from individual Castlepook bones spanning a long interval, approximately 45,700 to 19,950 years before present. Thus Castlepook establishes that these species occupied or visited Ireland over portions of the Middle and Late Devensian, not that every species was present in 31,290 BCE.

Spotted hyaena is especially revealing. Its bones and tooth-marked prey remains suggest that caves could be used as carnivore dens or repositories, rather than as natural cemeteries. Hyaenas may have carried in bones from scavenged or hunted carcasses; carnivores, water and later sediment movement all shaped what survives. Mammoth, reindeer and giant deer testify to open-country grazing opportunities, while Arctic foxes and lemmings reinforce the cold character of at least some phases. The absence of animals from the collection is less decisive: preservation, discovery and past collecting methods all determine what can be found.

People: A Possible Trace, Not a Population

There is no securely demonstrated settlement, house, hearth, cemetery, tool-making floor or human skeleton from Ireland that can be assigned to this date. Accordingly, there can be no evidence-based account of political affairs, diplomacy, leaders, institutions or organised conflict. There are no grounds for describing tribes, territories, languages, religious practices or social ranks in Ireland at 31,290 BCE. Those familiar categories belong to much later human societies and should not be projected backwards onto a nearly silent record.

A reindeer bone from Castlepook has been reported as carrying marks consistent with stone-tool butchery and dating to around 33,000 years ago. If further analysis confirms that the marks were made by people rather than carnivore teeth, sediment movement or damage during excavation, it would be important evidence that Upper Palaeolithic humans handled an animal in Ireland during MIS 3. It would not, by itself, demonstrate permanent residence, a large population or a named cultural group. A single

modified bone could represent a short visit by mobile hunters, or material brought to the cave through complex processes. The proper conclusion remains cautious: human presence is possible, not securely established as a settled Irish population.

Everyday Life Without an Archive

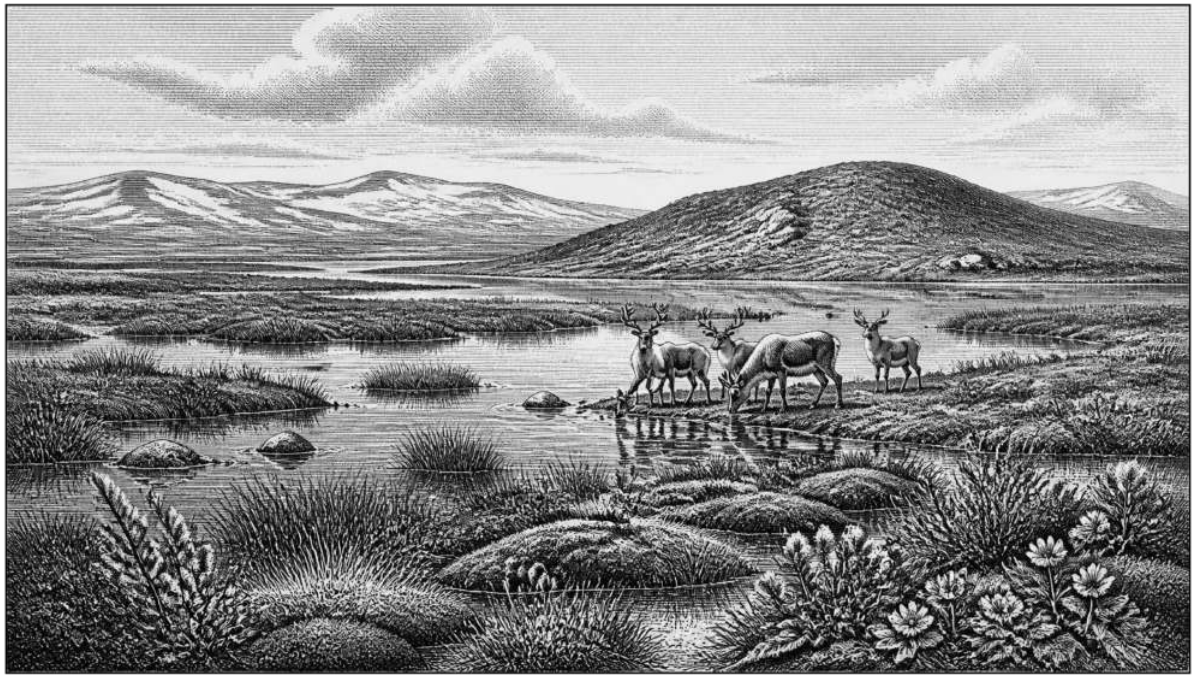
If people did enter Ireland in this period, their most plausible economy would have been highly mobile foraging: watching animal movements, obtaining meat and hides where opportunities arose, and exploiting seasonal plants, birds, fish or small game where local conditions allowed. That is an inference from Upper Palaeolithic lifeways elsewhere in north-west Europe, not direct evidence from an Irish camp. Neither Derryvree nor Castlepook has yielded the domestic debris needed to reconstruct food preparation, clothing, family life, ritual or learning in detail.

The more secure story is environmental. Derryvree records freshwater life persisting between glacial advances. Castlepook preserves the bones of animals adapted to or able to use cold open landscapes. Crag Cave records pulses of liquid-water circulation during climatic improvement. Together they show that Ireland around the notional date was neither a timeless frozen void nor a landscape ready for later farming and settlement. It was a volatile frontier of ice, tundra, wetlands and mobile fauna. The deepest historical lesson is methodological: at this depth of time, the responsible history of Ireland is a history of evidence—what a seed, a silt layer, a bone or a calcite drip can show, and what they cannot.

Chapter 012 of 100

31289 BCE

BIRM-166’s Sedge Waters [12]



The label “31,289 BCE” is a modern numerical convenience, not a date at which Irish archaeology can identify a particular event, season, individual or community. No calendar, writing or year-by-year record existed in Ireland at this depth of time. In radiocarbon terms it lies roughly 33,238 years before AD 1950, within the later Pleistocene and Marine Isotope Stage 3 (MIS 3). The responsible historical frame is therefore a wide calibrated interval, not a single year. The most useful Irish evidence comes from deposits and animal remains whose dates have uncertainties measured in centuries or millennia, and whose interpretation has sometimes changed as methods have improved.

An Ice-Age Interval, Not a Recorded Year

At this point Ireland was far from the familiar green, wooded island of later prehistory. It had not yet reached the Last Glacial Maximum, the cold peak during which the last Irish Ice Sheet expanded across much of the island, conventionally placed around 26,500–19,000 years ago. Yet it was already part of a volatile North Atlantic world in which temperatures, sea level, vegetation and the margins of ice sheets changed repeatedly. Climate shifts recorded in Greenland ice cores were rapid on geological timescales, while Irish cave deposits show that comparatively milder episodes could allow liquid water to circulate through shallow karst systems before colder phases returned.

That does not mean that all of Ireland was mild, habitable or ice-free at once. Conditions varied by region, altitude, exposure and proximity to ice. The dated evidence is patchy, and much of the landscape has been eroded, buried or reworked by later ice. Still, Irish stratigraphy rules out the simplest picture of

an island continuously sealed beneath unbroken ice throughout the whole late Pleistocene. Around the broad horizon represented by 31,289 BCE, Ireland contained changing combinations of cold open ground, wetlands, lake or pool margins, cave systems, exposed rock and advancing or retreating ice.

Derryvree Between the Tills

The strongest local guide is Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed organic silts and fine sands lying between two substantial tills: deposits left by separate episodes of glacial ice. That order of layers is crucial. It demonstrates an interval in which freshwater sediment and organic matter accumulated after one ice advance and before another. The deposit received the laboratory designation BIRM-166 and a conventional radiocarbon determination of 30,500 years BP, with a large uncertainty of roughly a thousand years either side.

When calibrated, that legacy measurement corresponds only broadly to approximately 36,900–31,700 calendar years BP. The nominal date of 31,289 BCE falls within the outer reach of this kind of chronology, but it cannot be presented as the date when the Derryvree pool formed, when a particular plant flowered, or when ice returned. Calibration converts a radiocarbon measurement into a probability range using independently constructed atmospheric curves; it does not create annual precision where none survives. Moreover, later reviews of Irish glacial chronology have rightly urged caution when using older radiocarbon assays as exact constraints. The evidence is powerful for sequence and environment, less so for a pinpointed date.

The plants and insects preserved at Derryvree nevertheless give the interval an unusually vivid character. Pollen, seeds, moss remains and beetle evidence indicate a treeless, cold-climate freshwater and muskeg setting rather than forest. Sedges and grasses were important, alongside plants suited to open northern ground and wet margins, including bogbean, mountain-avens, willow and lesser clubmoss. Fossil water-milfoil and other aquatic signals indicate standing or slow-moving fresh water. Mossy ground rich in decaying vegetation surrounded pools. This was not a barren white desert, but neither was it later Ireland’s leafy countryside: it was a strongly seasonal tundra-wetland mosaic under periglacial conditions.

Cold Ground and Living Water

Periglacial does not simply mean “near ice”. It describes a landscape shaped by severe cold, repeated freezing and thawing, sparse or low vegetation and ground processes such as frost action and solifluction. At Derryvree, the coexistence of freshwater organisms with cold-adapted terrestrial vegetation shows why such environments should not be imagined as lifeless. During favourable parts of the year, shallow pools, saturated mosses and sedge beds could support abundant small-scale ecological activity. In winter, however, the same setting may have been exposed to deep frost, snow cover, frozen soils and harsh winds.

Comparable evidence in Fermanagh adds regional context without making Derryvree a proxy for the whole island. Organic deposits at Hollymount, Greenagho and Aghnadarragh also record non-glacial intervals between or beneath till sheets. Their dates and correlations are not all equally secure, but collectively they show that northern Ireland experienced more than one cold, open, partly ice-free phase during the Midlandian, the Irish name traditionally used for the last glacial cycle. These archives preserve a history of environmental oscillation: ice advance, open-ground or wetland conditions, then renewed ice, rather than a single uninterrupted descent into the Last Glacial Maximum.

Castlepook’s Animal Record

County Cork provides a different sort of evidence. Castlepook Cave, near Doneraile, has long yielded an important but complicated assemblage of Pleistocene animal bones. Research on the cave’s fauna, aided by improved radiocarbon pretreatment, has shown that several earlier dates required revision and that some remains are substantially older than once believed. The assemblage establishes the presence in southern Ireland of large mammals during MIS 3, including reindeer, giant deer, mammoth and spotted hyaena. These animals did not necessarily occupy the cave together, or in the same generation. Cave deposits are accumulations, not photographs of one day.

The animals nonetheless help define the kind of country that existed somewhere within reach of the cave. Reindeer point to open, cold landscapes with seasonal grazing; mammoth and giant deer also belong to a late Pleistocene fauna unlike that of historic Ireland. Spotted hyaenas could carry and modify carcass parts, a reminder that bone concentrations may result from predators and scavengers as well as natural deaths, water movement, collapse or excavation disturbance. Castlepook was therefore part of a food web, but the precise geography of its herds, hunting grounds and seasonal routes cannot be reconstructed from the cave alone.

A reindeer femur from Castlepook has been publicised by County Cork heritage material as dating broadly to about 31,000 BC and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as a sharp stone-tool cut made during carcass processing. If that interpretation is sustained through detailed taphonomic study and securely contextual evidence, it could represent an exceptionally early indication that people handled a reindeer in Ireland. It deserves attention, but also restraint. The bone date identifies the age of the animal, not necessarily the exact moment the mark was made. No securely associated Upper Palaeolithic tool assemblage, hearth, dwelling floor, burial or repeated occupation layer of this age has been published from the cave.

People: A Possibility, Not a Population

For that reason, 31,289 BCE cannot responsibly be described as the year Ireland acquired settlers, hunters or an identifiable population. A single possible butchery trace would be evidence for one action, not for permanent residence. It would not reveal how many people were involved, where they came from, how they crossed or travelled around the Irish Sea region, what language they spoke, or whether they returned. Lower global sea levels altered the geography of the surrounding shelves, but did not automatically provide a simple, durable land bridge into Ireland. Any approach may have involved coastal travel, short sea crossings, changing ice margins or routes now submerged.

It is reasonable to say that mobile Upper Palaeolithic groups elsewhere in north-west Europe possessed sophisticated knowledge of animals, stone-working, clothing, fire, seasonal movement and social communication. It is not reasonable to transfer every feature of continental or British sites directly to Ireland. Irish evidence around this horizon contains no art, ornaments, structures, burials, named places or human remains from which a local culture can be securely described. Even later evidence for a human presence at Alice and Gwendoline Cave in County Clare, dated to around 12,800–12,600 calibrated years BP, is modest: a cut-marked brown-bear kneecap rather than a fully exposed settlement.

No Polities, No Recorded Beliefs

Political affairs, diplomacy, warfare, formal religion and learning leave no identifiable Irish record for this date. There were no known kingdoms, tribes, institutions, monuments, farms, markets or written traditions. Nor can archaeologists identify a cult or ritual from Derryvree's plants or Castlepook's bones. The absence is important, not an invitation to fill the silence with later Celtic, Gaelic or medieval ideas. Ireland's later cultural history has no demonstrable continuity traceable to a particular group living, or perhaps briefly visiting, at this time.

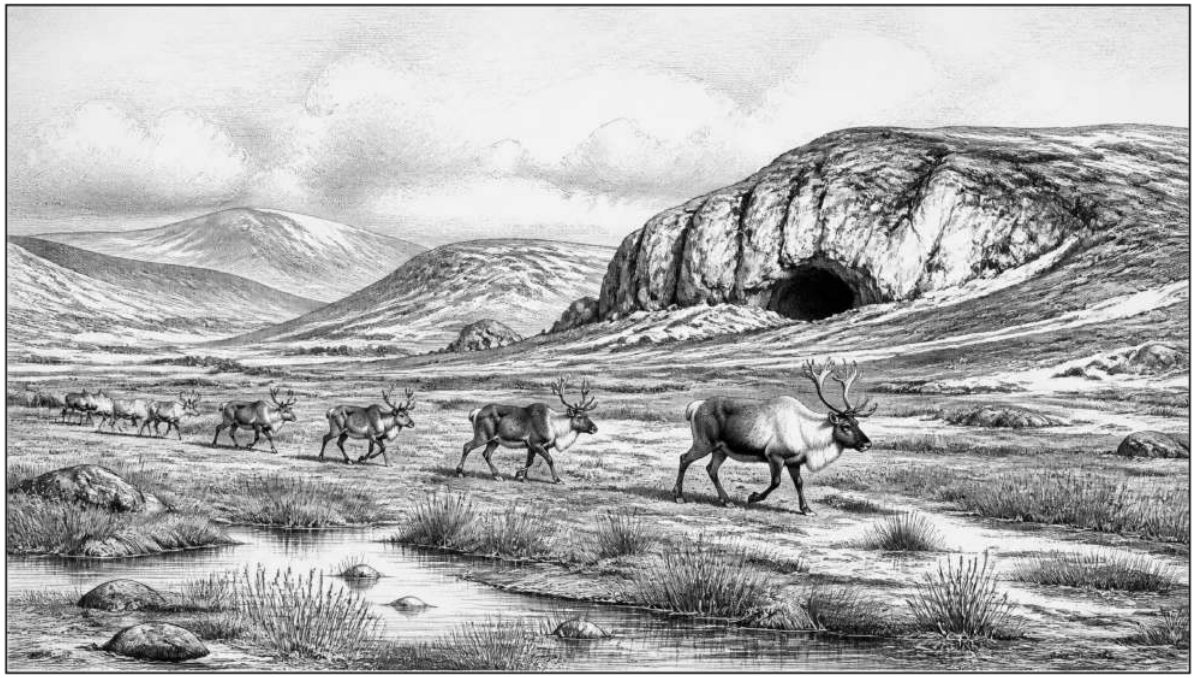
The economy that can be responsibly discussed is ecological rather than social: plants grew, herbivores browsed and grazed, carnivores scavenged or hunted, and freshwater habitats formed amid frost-affected terrain. If people were present, reindeer carcass processing is a plausible activity; sustained hunting, exchange networks, boat-building or settlement patterns remain unproved. The most important development was environmental. Ireland stood within the long prelude to the maximum expansion of the last ice sheet, while its lakes, wetlands and caves retained scattered evidence of conditions that later glaciers would partly erase.

Thus the history of Ireland around 31,289 BCE is neither an empty page nor a conventional national story. It is a history recovered from silts beneath a Fermanagh drumlin, calcite in a Kerry cave, and animal bones in Cork limestone. These records show a cold, treeless and changing island with living freshwater niches and a distinctive large-mammal fauna. They also preserve an unresolved possibility: that small groups of people may have reached this Atlantic edge of Upper Palaeolithic Europe. For now, the evidence supports a landscape and its inhabitants more securely than it supports a human society.

Chapter 013 of 100

31288 BCE

The Doneraile Reindeer Line [13]



Modern calendar-year precision is not available for Ireland in 31,288 BCE. This label is a convenient point in deep time, roughly 33,200 years before present in the archaeological convention that counts back from AD 1950, rather than a date at which an Irish event can be assigned to a particular season or generation. The responsible setting is the later part of Marine Isotope Stage 3 (MIS 3), an exceptionally changeable phase of the last Ice Age. Evidence consists of radiocarbon ranges, cave bones, pollen and plant remains, sediments, and cave mineral deposits. Each carries uncertainties of centuries or millennia. What can be recovered is not a historical chronicle, but a careful picture of landscapes, animals and a possible human encounter.

A Cold, Unsettled Island

Ireland lay on Europe’s Atlantic north-western margin, exposed to rapid shifts in temperature, rainfall, sea ice and glacier growth. It was not yet in the full Last Glacial Maximum, the great expansion of the British–Irish Ice Sheet which followed and reached its maximum volume around 23,000 years before present. Reconstructions show that ice-sheet growth and maximum extent varied considerably from one sector to another. Therefore, it would be unsafe to imagine every part of Ireland as either wholly ice-covered or wholly open in 31,288 BCE. The island’s geography was being repeatedly remade by advancing ice, frost action, meltwater and changing sea level.

The strongest Irish indication of conditions broadly comparable with this nominal date comes from Derryvree near Maguiresbridge, County Fermanagh. Road works there exposed organic silts and fine sands trapped between two till sheets within a drumlin. A radiocarbon determination on this freshwater deposit was 30,500 radiocarbon years before present, with a wide uncertainty; subsequent calibration places the evidence broadly between about 36,900 and 31,700 calibrated years before present. That is a

range, not an anniversary, but it overlaps the wider period in question. Its plants, insects and other remains indicated open tundra and a periglacial regime: ground shaped by intense seasonal freezing and thawing rather than a forested landscape.

Such a world was not necessarily lifeless or uniformly bleak. Low vegetation could occupy sheltered ground, wet hollows and the margins of shallow waters. Mosses, sedges, grasses and cold-adapted flowering plants formed a patchwork whose composition altered as temperatures shifted. Waterlogged deposits preserve these minute witnesses far better than exposed slopes preserve campsites. They show that, during at least some milder intervals, fresh water and vegetation persisted in northern Ireland even while the broader climatic direction was towards harsher conditions and renewed glaciation.

Crag Cave and Rapid Climate Change

Crag Cave in County Kerry supplies a different kind of record. Stalagmites grow only when water can circulate through the cave system and temperatures permit liquid water. Uranium-thorium dates show that calcite deposition in the cave occurred episodically through much of the last glacial period, including MIS 3. This is evidence for repeated ameliorations, not proof of a warm Irish climate. The cave’s record fits the wider North Atlantic pattern in which abrupt Greenland warm phases, followed by colder stadials, could change conditions over only decades or centuries.

For people or animals attempting to live at Europe’s edge, such instability mattered as much as average temperature. A landscape productive enough for grazing animals in one interval could become wind-scoured, frozen or ice-bound in another. Rivers could alter course under meltwater, and cave entrances and valleys could become inaccessible. Long-term settlement, if it existed at all, would have faced repeated interruption. That volatility helps explain why a modern historian cannot sensibly write of a settled Irish polity, fixed territory or continuous community at this date.

The Castlepook Evidence

The most important site for the period is Castlepook Cave near Doneraile in north Cork, also known historically as Mammoth Cave. Its chambers produced more than 2,000 animal bones during excavations from the late nineteenth century onwards, and later work has shown that individual remains span a long part of the Ice Age. Geological Survey Ireland describes it as Ireland’s richest site for vertebrate fauna in the period leading towards the Last Glacial Maximum. Its assemblage includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena; later deposits also contain lemmings, Arctic fox and wolf.

That list should not be read as a single herd grazing together on one day. Cave deposits accumulate over long periods, and Castlepook was a carnivore den, a bone trap and a place disturbed by water as well as an archaeological archive. Spotted hyaenas could carry and gnaw carcass parts into their lairs. Roof collapse, flowing water, antiquarian excavation and later mixing all complicate the original positions of bones. Improved radiocarbon pretreatment has already demonstrated that some earlier dates from southern Irish caves were too young. Every individual bone therefore needs its own identification, dating and taphonomic assessment.

Within this difficult record, a fragment of reindeer femur from Castlepook has particular importance. It has been publicly reported as dating to about 33,000 years ago and bears a deep linear modification interpreted by zooarchaeologist Ruth Carden as a cut or chop made by a sharp stone tool during butchery.

If that reading is confirmed through full specialist publication and comparison, it would be the earliest direct indication that people handled an animal in Ireland: not merely that humans could have reached the island, but that they processed a reindeer here.

The distinction is crucial. The dated bone is evidence for a reindeer; the incision is the basis for the human interpretation. No securely associated stone tool, hearth, dwelling floor, human skeleton, clothing, art or settlement of this age has yet been recovered in Ireland. The femur cannot tell us whether one hunting party visited briefly, whether several people camped nearby, or whether a carcass was processed elsewhere before part of it entered the cave. It certainly cannot establish permanent occupation. Yet it makes the question of Upper Palaeolithic activity in Ireland much more serious than it once was.

Animals, Movement and Food

Reindeer were well suited to cold, open country and are the animal most directly relevant to the Castlepook line. Mammoth and giant deer also point to landscapes capable, at intervals, of sustaining large herbivores, while wolves and hyaenas indicate a complex predatory system. Their presence demonstrates animal movement into and through Ireland during the Ice Age, although the timing and routes differed by species. Sea levels were far lower than today, and the configuration of the Irish Sea basin, ice margins and exposed land was changing. There is no basis for imagining a simple, permanent land bridge or a single migration route. Animals and any humans instead moved through a shifting coastal and glacial borderland.

If people made the Castlepook mark, their immediate economy was likely founded on mobile hunting and scavenging, knowledge of carcass processing, and the practical use of sharp stone edges. That is an inference from the proposed cut mark and the wider Upper Palaeolithic record of north-west Europe, not an excavated Irish tool-kit. Reindeer could provide meat, fat, hide, sinew, antler and bone, but no Irish evidence from this time demonstrates how those materials were shared or used. It is more accurate to speak of a possible short-lived hunting episode than of an established “reindeer-hunting culture”.

Society Beyond the Evidence

There is no evidence for political institutions, leaders, diplomacy, warfare, territorial boundaries or organised conflict in Ireland at this date. Nor can archaeologists identify an Irish language, named people, ethnic group or religion. These are not omissions waiting to be filled with imaginative detail; they are questions that the surviving record cannot answer. A single modified bone does, however, imply skills that were learned socially: an understanding of animal anatomy, a workable cutting implement and knowledge of how to obtain food in a risky environment. If visitors came, they probably belonged to social networks extending beyond Ireland, because no small group survives an Ice Age frontier solely through isolated improvisation. This remains a reasoned possibility, not direct proof.

Likewise, there is no securely Irish evidence for ritual, cave art, burial or formal learning around 31,288 BCE. European Upper Palaeolithic communities elsewhere produced striking art and sophisticated hunting technologies, but those achievements cannot simply be transferred across the sea to Ireland. Castlepook was a natural cave used heavily by animals; it should not be treated as an Irish sanctuary or a human home without stratified archaeological evidence.

An Archive, Not an Origin Story

Later Irish prehistory is much more visible. A brown-bear kneecap with stone-tool cut marks from Alice and Gwendoline Cave, County Clare, is directly dated to about 12,810–12,590 calibrated years before present. Sustained evidence for settlement is clearer still in the Mesolithic, millennia afterwards. The contrast matters. The temptation is to turn the Doneraile femur into the beginning of an uninterrupted national story. The Ice Age record does not support that. Advancing ice later covered much of or perhaps all of the island, and any early visitors may have left no surviving descendants or continuing settlement.

The real importance of 31,288 BCE lies in its challenge to old assumptions. Ireland was not simply an empty, frozen blank before the first well-known post-glacial settlers. It was an environmentally dynamic frontier inhabited by a changing fauna, with caves preserving fragments of an otherwise devastated record. Derryvree offers a dated window onto tundra wetlands; Crag Cave records repeated climatic reversals; Castlepook holds the remains of animals that lived near the threshold of major ice advance. The reindeer line, cautiously interpreted, may also preserve a fleeting human trace. Future excavation, direct dating and microscopic study may strengthen, alter or reject that conclusion. For now, uncertainty is not a weakness in the story: it is the most honest feature of Ireland’s deep past.

Chapter 014 of 100

31287 BCE

Derryvree’s Middle Midlandian [14]



Modern calendar-year precision is not available for Ireland in 31,287 BCE. No community on the island left writing, a calendar or a historical record that can identify a particular year, season, person or event at this depth in time. The date is best treated as a modern reference point—roughly 33,200 years before AD 1950—within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a long and climatically unstable phase of the last Ice Age. What can responsibly be reconstructed is an environmental interval, from fragmentary deposits, fossils, landforms and laboratory dates, rather than an annual chronicle.

A Date Within Broad Ranges

The closest securely relevant Irish archive is Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and revealed a sequence of freshwater silts, fine sands and organic material lying between two thick layers of till, the unsorted debris deposited by glacier ice. The sequence is important because its order is clear: ice affected the ground, a period followed in which freshwater and organic sediments accumulated, and glacier ice later returned to bury the evidence.

Organic material from the intervening deposit produced the radiocarbon determination Birm-166, conventionally reported as 30,500 radiocarbon years before present, with a substantial uncertainty. A radiocarbon age is not a calendar age. Atmospheric carbon-14 levels changed through time, and calibration converts a laboratory measurement into a probability range rather than a single historical date. Published calibrations have placed the Derryvree material broadly at about 36,900–31,700 calibrated years before present. The modern label 31,287 BCE falls within that wide range, but it does not date a particular pool, animal, human visit or phase of vegetation at Derryvree.

This distinction matters. The evidence says that part of north-central Ireland was ice-free when the freshwater deposit formed; it does not demonstrate that every region of the island shared precisely the same conditions at the same moment. Nor should an old radiocarbon determination be treated as a stopwatch. The changing calibration curve, the original measurement error, and the fact that sediments may accumulate over time all argue against false precision. “Around this horizon” is sounder language than “in this year”.

Freshwater Beneath a Drumlin

Derryvree nevertheless gives an unusually vivid glimpse of an Irish landscape later overridden and reshaped by ice. Pollen, plant macrofossils, mosses and insect remains indicate open tundra vegetation and a periglacial climate: a cold environment affected by repeated freezing and thawing, but not one continuously buried beneath glacier ice. The local setting included wet ground and shallow freshwater, with silts and sands settling in calm water and organic matter surviving in waterlogged sediment.

The plant evidence points away from a wooded landscape. Herbaceous pollen and hardy mosses indicate exposed ground, while the wetland flora included species associated with cold, open habitats and pool margins. Sparse tree pollen does not prove a nearby forest; pollen can travel long distances, especially where local vegetation is thin. The most responsible reconstruction is therefore a treeless or near-treeless mosaic: damp hollows, sedge-rich margins, mossy patches, shallow pools and more exposed mineral ground beyond them. Summer growth could be brief but productive, while winter frost, snow cover and frozen soils constrained the living season.

Such a scene should not be imagined as a uniform, lifeless white wilderness. Periglacial landscapes can contain varied microhabitats. Water, sheltered depressions, snowmelt and differences in drainage created local contrasts that plants, insects and small animals could exploit. Yet it was emphatically not later Ireland’s green, wooded and farmed countryside. There were no fields, hedges, villages, roads, peat-cuttings or managed grazing lands. The drumlin itself, so characteristic of the modern Irish landscape, would later be given its familiar form or modified further by glacial action; at the time represented by the buried deposits, it was part of a changing terrain rather than a settled landmark.

Ice Was Growing, Unevenly

At this point in MIS 3, the island lay within the wider North Atlantic climate system, where abrupt shifts between colder stadials and relatively milder interstadials occurred on millennial and shorter timescales. Greenland ice-core records show that these fluctuations could be large and rapid in the northern hemisphere. Ireland’s weather and ecosystems did not simply copy Greenland’s sequence, but its Atlantic setting made it sensitive to changes in temperature, sea ice, storm tracks and the growth of neighbouring ice masses.

Derryvree’s freshwater layer is evidence that northern Ireland was locally ice-free during part of this broader interval. Other pre-Last Glacial Maximum evidence, including deposits at Greenagho in Fermanagh and marine records around the western seaboard, likewise cautions against assuming that Ireland was already wholly ice-covered. The great expansion of the last British–Irish Ice Sheet came later. Reconstructions place its extensive maximum on the Irish Atlantic shelf and around the island broadly in the period after about 27,000 calibrated years before present, with regional advances and retreats differing in timing.

The future was therefore present only as a geological tendency, not a completed event. Ice was capable of advancing across the region, as the enclosing tills at Derryvree show, but the deposit preserves an interval between glacial episodes. Later ice erosion destroyed or disturbed vast amounts of earlier evidence. This is one reason why Irish knowledge of the period is so patchy: much of the landscape that might once have held campsites, shorelines, soils and animal tracks was scoured, buried or reworked.

Animals in the Southern Caves

County Cork offers a different kind of evidence. Castlepook Cave, near Doneraile, long known as Mammoth Cave, has yielded remains of Ice Age animals including woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena. Modern redating has shown that parts of this fauna belong to MIS 3 and that some earlier radiocarbon results from Irish cave collections underestimated their true age. Castlepook confirms that Ireland, or at least suitable districts within it, could support a more varied cold-stage fauna than the sparse surviving record once suggested.

These bones do not form a census of one landscape in one year. Cave deposits commonly combine material accumulated over long periods. Carnivores may drag prey or carrion into caves; animals may die naturally in or near entrances; water, gravity and early excavators can mix deposits. Spotted hyaena is particularly significant because it suggests the presence of a large scavenging predator and because dens can concentrate bones from many episodes. Mammoth and reindeer indicate open-country grazing habitats, but neither species proves that a herd stood at Castlepook in 31,287 BCE.

Even so, the faunal record gives scale to the Derryvree environmental evidence. Open, cold habitats could sustain large herbivores and the predators or scavengers associated with them. Their movements would have followed seasonal food, shelter, terrain and snow conditions. In this sense, Ireland was part of a north-west European Ice Age ecological world, although its sea crossings, shifting coastlines and advancing ice margins made it a geographically difficult western margin rather than an easy extension of the continent.

The Reindeer Bone Question

Castlepook also raises the most consequential archaeological question for this date. A reindeer femur from the cave has been reported as bearing a deep mark interpreted as stone-tool damage made while the bone was fresh. The animal bone has been associated with an age of roughly 33,000 years ago. If the modification is confirmed as human-made and contemporary with the bone, it would indicate an Upper Palaeolithic episode of carcass processing in Ireland vastly earlier than the island’s well-established Mesolithic settlement record.

That possibility must not be inflated into a story of a permanent Irish population. The femur derives from an old cave collection, rather than a modern excavation of a sealed occupation floor. No securely associated stone-tool assemblage, hearth, dwelling, human burial, repeated butchery area or settlement of comparable age has yet been recovered from Ireland. The radiocarbon result dates the death of the reindeer, not automatically the making of the mark; distinguishing a cut made by a stone tool from damage caused by carnivores, sediment movement, breakage or excavation requires careful microscopic and comparative work.

The evidence therefore permits a limited interpretation: people may have reached Ireland during this cold-stage interval and may have processed a reindeer. It does not yet establish where they came from, how they crossed, whether they hunted the animal, how long they stayed, or whether they returned. At

most, the marked bone hints at a fleeting connection with the Upper Palaeolithic societies known elsewhere in north-west Europe. Their technologies, social practices and art cannot simply be transferred across the sea to Ireland without direct local evidence.

No Polities, No Proven Trade

There is no evidence for political institutions, named groups, chiefs, warfare, diplomacy, religion, formal learning or trade networks in Ireland at this date. There are no known houses, cemeteries, monuments or symbolic objects that can be securely assigned to this horizon. Nor can social organisation be inferred from a wetland deposit or a cave bone. If people visited, they may have travelled in small, mobile groups, as many Upper Palaeolithic communities elsewhere did, but that is a contextual possibility rather than an Irish fact.

Likewise, “economy” can only be discussed conditionally. Reindeer, mammoth and other animals represented potential food, hides, bone and antler resources to human groups, while wetland plants and freshwater habitats supported broader food webs. But no Irish evidence from around 31,287 BCE demonstrates a settled hunting territory, seasonal camp cycle, exchange route or organised production. The responsible history is one of potential resources in a demanding environment, not an established economy.

A Landscape Known Indirectly

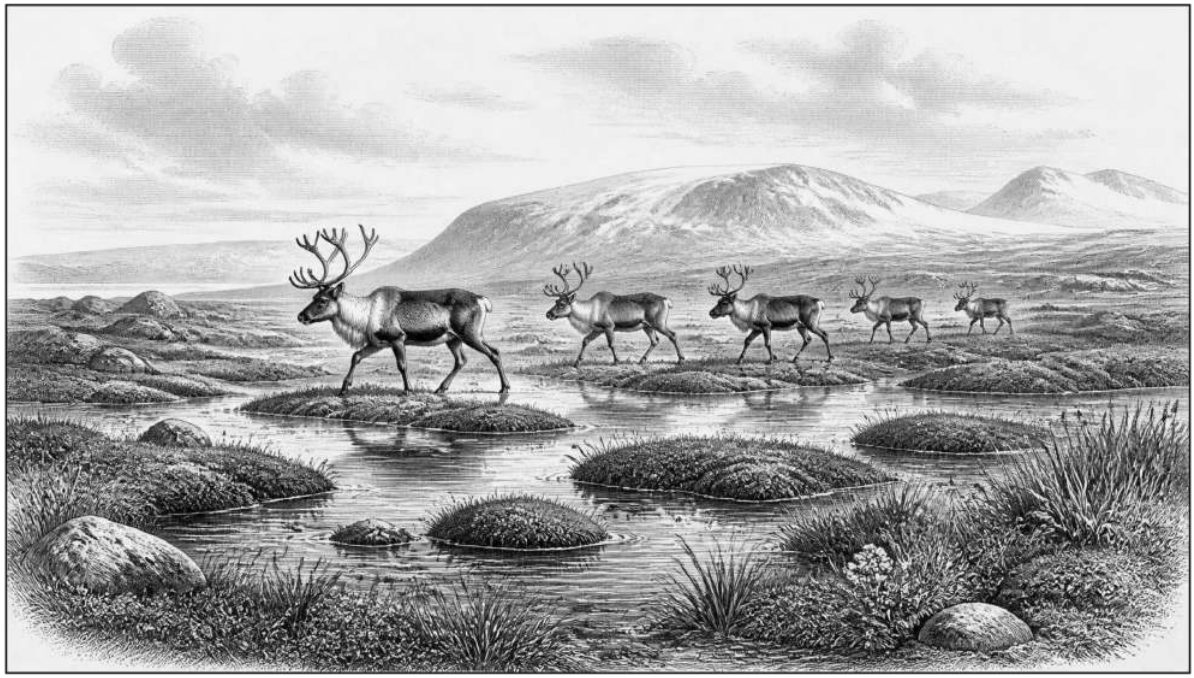
Ireland around the notional year 31,287 BCE was neither a blank nor a documented society. Derryvree preserves strong evidence for a cold, locally ice-free freshwater tundra landscape in a broad late-MIS-3 interval. Castlepook preserves a valuable but time-averaged record of Ice Age fauna, and one contested reindeer bone raises the possibility of very early human activity. Together they reveal an island undergoing profound environmental change before the later maximum of the British–Irish Ice Sheet.

The central lesson is methodological as much as historical. Sediments record water and vegetation; animal bones record species and, sometimes, the actions of predators or people; tills record ice. None alone can yield a calendar-year narrative. But read together, and with their limits kept visible, they allow a compelling picture: open ground and cold pools in Fermanagh, large grazing animals and carnivores in Cork, uncertain human traces, and an Irish landscape on the threshold of far more extensive glaciation.

Chapter 015 of 100

31286 BCE

Castlepook’s Hyena Coprolites [15]



There is no responsible way to describe an event that happened in a calendar year called 31,286 BCE. This label is a modern backward projection, not a date used by anyone then, and the evidence is nowhere near precise enough to distinguish one year from the next. In relation to 1950, the conventional reference point for radiocarbon dating, it falls about 33,235 years ago. The most useful Irish evidence belongs to broad calibrated ranges of thousands of years. Ireland at this horizon lay within the Late Pleistocene, specifically Marine Isotope Stage 3 (MIS 3), in the long cold interval traditionally called the Midlandian in Ireland.

The nearest securely relevant environmental sequence is not an annal but a buried deposit at Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater silts and fine sands there returned a radiocarbon age of about 30,500 BP. Using modern calibration, the deposit is placed broadly at c. 36,900–31,700 calibrated years BP. The modern year-label 31,286 BCE therefore falls within that range, but this does *not* mean that the Derryvree sediments record that precise year. They document a phase of environmental conditions, accumulated over time, before a later ice advance covered the locality.

A Landscape Between Ice Advances

Derryvree was exposed in a road cutting through a drumlin in 1969. Its importance lies in its simple but powerful stratigraphy: freshwater sediments lay between two thick layers of till, the unsorted material deposited by glacier ice. The lower till proves that ice had previously occupied the area; the organic middle layer shows that the place was later free of local ice long enough for water, sediment and living communities to develop; the upper till shows renewed glaciation. This is evidence for a changing Ice Age landscape, not for uninterrupted warmth or for an Ireland wholly free of ice.

The plants, mosses, insects and other remains in the middle layer point to open tundra and wet muskeg rather than woodland. Shallow pools and waterlogged, plant-rich ground were bordered by mossy vegetation. Botanical evidence includes cold-adapted species such as mountain avens, while insect remains reinforce the picture of a severe periglacial setting. Summers could sustain liquid water, growing plants and insects; winters were harsh. In modern terms, it was a treeless northern landscape, but one with ecological variety at the scale of pools, sedge margins, exposed mineral ground and damp peat.

Such conditions should not be imagined as a single unchanging freeze. Greenland ice cores reveal abrupt climatic oscillations during the last glacial period, and Irish evidence registers their local consequences imperfectly. At Crag Cave in County Kerry, uranium-thorium dating of calcite formations shows that speleothems grew episodically during MIS 3. Because shallow-cave calcite needs infiltrating liquid water and conditions generally above freezing, these growth episodes indicate intervals of climatic amelioration. They cannot date Derryvree or Castlepook year by year, but together they show that Ireland’s Atlantic-edge climate could shift sharply between more and less favourable phases.

Animals at Castlepook

For animal life close to this broad horizon, Castlepook Cave near Doneraile, County Cork, is indispensable. Also known as Mammoth Cave, its narrow limestone galleries were investigated extensively in the early twentieth century. More than 2,000 bones have been recovered, making it Ireland’s richest known repository of vertebrate remains from before the Last Glacial Maximum. The collection includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, as well as wolf, Arctic fox and lemmings from parts of the wider Ice Age sequence.

Its evidence must nevertheless be read cautiously. A cave is not a census of the surrounding countryside. Carnivores can drag prey or carrion underground; animals can die in caves; water can redeposit bones; and early excavation techniques did not meet modern standards. Castlepook’s deposits were also disturbed by water. The presence of bones proves that particular animals reached, used, or were introduced into the cave system during parts of the period represented; it does not establish their population sizes, a stable community existing all at once, or a particular scene in 31,286 BCE.

The spotted hyaena is especially revealing. Historic excavators found crushed bone and fossil dung, or coprolites, in chambers they named Hyenahall and Elephant Hall. These are strong indications that hyaenas used areas of the cave as dens or feeding places. Reindeer remains were abundant, and the pattern is consistent with hyaenas transporting animal parts into shelter. Yet even here interpretation has limits: the cave accumulated material through repeated episodes. It supports the conclusion that a formidable bone-processing predator lived in southern Ireland during MIS 3, not a claim that every mammoth, deer and hyaena bone belonged to one encounter.

Modern re-dating has sharpened this warning. Improved pretreatment of bone samples produced Castlepook dates substantially older than some earlier measurements, placing parts of the fauna firmly within MIS 3. The results suggest that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, perhaps around 40,000 calibrated years BP. A 2026 sedimentary ancient-DNA study from Castlepook has added promising evidence of wider Eurasian connections among Irish mammoths, hyaenas and bears. It remains a preprint rather than a peer-reviewed final publication, so its detailed conclusions should be treated as provisional; its chief value here is to underline how much the cave’s old sediments can still reveal.

Access to an Atlantic Peninsula

At this time Ireland's geography differed markedly from today's, because global sea level was lower during the Ice Age and glaciers repeatedly reshaped the coasts and adjacent seas. It is tempting to turn the mammal record into a simple story of a dry land bridge from Britain, but the evidence does not justify a precise route for this date. Animals evidently reached Ireland at various times in the Late Pleistocene. Whether they moved across exposed ground, temporary northern links, ice-associated corridors, short sea crossings, or combinations of these depends on changing sea level and ice geometry. The timing and nature of any connection remain matters for geological reconstruction, not certainty.

What can safely be said is that Ireland was not an ecological world wholly cut off from north-western Europe. The Castlepook fauna, including wide-ranging herbivores and predators, indicates intermittent faunal connectivity before the major expansion of the British–Irish Ice Sheet. Ireland was probably a peripheral, environmentally volatile part of a wider north-west European zone rather than a permanent refuge. This was not yet the full Last Glacial Maximum: large-scale reconstructions place the British–Irish Ice Sheet's greatest volume around 23,000 years BP, later than the Derryvree interval. But ice growth was already complex, regional and capable of erasing much earlier surface evidence.

No Human Society Demonstrated

The central historical restraint is that no securely dated human settlement, hearth, stone-tool assemblage or human burial is known from Ireland at c. 33,235 calibrated years BP. Nor does the Castlepook fauna prove human hunting. One reindeer bone from the wider Castlepook material has been argued to bear a stone-tool cutmark and has featured in discussion of a possible very early human presence. That claim deserves continued testing, but a single modified bone without an associated occupation surface cannot demonstrate a resident population, its identity, its technology or its social life.

The earliest well-dated evidence for human activity presently accepted in Ireland is much later: cutmarks on a brown-bear patella from Alice and Gwendoline Cave in County Clare date to roughly 12,810–12,590 calibrated years BP. This terminal-Pleistocene discovery is important precisely because it illustrates the gap. Upper Palaeolithic people certainly lived elsewhere in Europe at the time of the Derryvree and Castlepook evidence, but their presence in Ireland around 31,286 BCE remains unproven. Absence of evidence is not proof that no exploratory visit ever occurred; it is, however, decisive against writing a human narrative as fact.

What Cannot Be Recovered

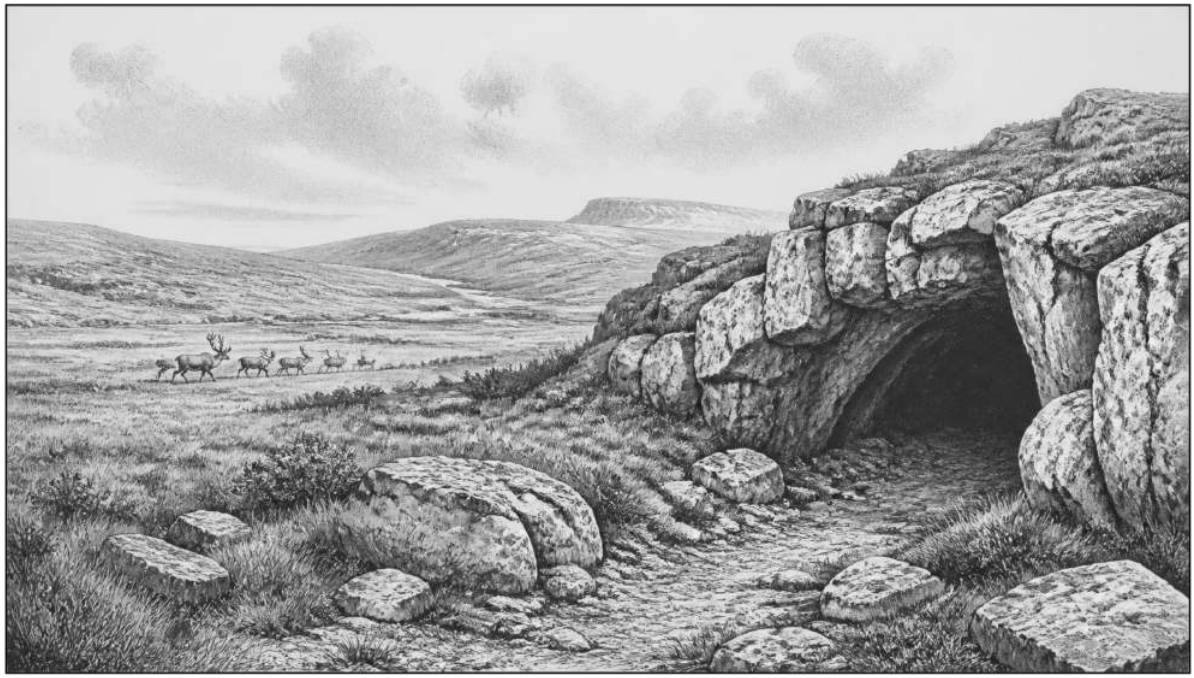
Consequently there is no evidence-based account of political affairs, diplomacy, warfare, kinship groups, language, ritual, art, formal learning, trade or permanent settlement in Ireland for this date. There were no states, named peoples or recorded leaders to identify. Even if people briefly entered the island, the material record currently cannot distinguish their choices from those of predators, scavengers, water or later disturbance. It would be misleading to assign them huts, clothing styles, beliefs, trading partnerships or conflicts merely because such things are known from Upper Palaeolithic societies elsewhere.

There is, however, a meaningful Irish history here: the history of a land repeatedly opened, occupied by life and transformed by ice. Derryvree preserves a wet tundra ecosystem between glacial episodes. Castlepook preserves the fragmentary remains of mammals, including hyaenas that left their own unmistakable traces in a Cork cave. Crag Cave records periods when water once again dripped through limestone and deposited calcite. These are not substitutes for lost human stories. They are the harder, stranger evidence from which any responsible account of Ireland around 31,286 BCE must begin.

Chapter 016 of 100

31285 BCE

Cork Cave Reindeer Femur [16]



31,285 BCE is a useful modern label for placing a remote point in deep time, but it was not a year that anyone in prehistoric Ireland could have named, counted or recorded. There are no annals, settlements or securely dated human artefacts from a single calendar year this far back. The responsible history of Ireland at this point must therefore be written in broad calibrated ranges, geological stages and carefully qualified archaeological evidence. In calendar terms, the requested date falls roughly 33,200 years before the 1950 “present” convention used in radiocarbon science, within the later part of Marine Isotope Stage 3 (MIS 3), a fluctuating cold phase of the Pleistocene.

A Landscape Before the Maximum Ice

Ireland was then within the Midlandian cold stage, the Irish expression for the last glacial cycle. It was not yet at the Last Glacial Maximum, the later interval when the British–Irish Ice Sheet expanded to its greatest known extent, broadly after about 26,000 calibrated years before present. That distinction is important. It would be wrong to picture all of Ireland in 31,285 BCE as a uniform, continent-wide ice cap. Equally, it would be wrong to imagine a mild, wooded island resembling the modern countryside. Conditions changed repeatedly and sharply across north-west Europe, while the extent of ice in different Irish regions remains a subject of active reconstruction.

The strongest evidence suggests that parts of southern Ireland supported land animals during portions of MIS 3. Such evidence does not provide a weather report for one notional year, but it establishes that Ice Age habitats existed here before the later glacial maximum. Open, cold-adapted country is the most defensible general picture: grassland, herb-rich tundra or steppe-tundra, patches of low scrub in

favourable places, exposed soils, seasonal wetlands and little or no closed forest. Summers may have permitted a brief but productive growing season; winters were severe, with frost, snow, strong winds and a landscape vulnerable to periglacial processes such as freeze-thaw cracking and soil movement.

Sea level was much lower than today because immense quantities of water were stored in northern ice sheets. The outlines of coasts, river valleys and lowlands were consequently different, and some landscapes now beneath the Atlantic or Irish Sea were dry land. Yet lowered sea level alone does not prove a particular route into Ireland. Whether a person or animal could pass between Britain and Ireland depended on local topography, ice, water, season and the changing configuration of the Irish Sea basin. No excavated route, crossing place or boat from this period has been found in Ireland.

Castlepook’s Mixed Archive

The central Irish locality for this period is Castlepook Cave, also known historically as Mammoth Cave, near Doneraile in north County Cork. It lies in limestone country above the Awbeg Valley, below the Ballyhoura Hills and within the wider Blackwater catchment. Excavations conducted chiefly in the early twentieth century recovered a remarkably rich collection of animal bones. Later study, including improved accelerator radiocarbon dating and modern pretreatment of bone collagen, has shown both how valuable and how difficult this archive is.

Castlepook and other southern Irish caves have produced remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. The presence of these species demonstrates that Ireland was, at least intermittently, part of a wider north-west European world of cold-stage mammals. Large herbivores required extensive forage; predators and scavengers exploited them; caves could serve as dens, shelters, traps for bone or places where animals dragged carcass parts. This is a richer ecological setting than the modern Irish fauna might lead one to expect.

However, Castlepook is not a single sealed deposit preserving one moment in time. Much of its material was recovered before modern excavation standards, from a complex cave system where deposits had been disturbed by carnivores, water, earlier digging and later movement. Direct re-dating has revised some old determinations substantially, in certain cases by thousands of radiocarbon years. The species list must not be turned into a literal tableau in which every animal stood together in north Cork in 31,285 BCE. It instead records repeated episodes within a long pre-Last Glacial Maximum interval, alongside later Pleistocene material.

The Reindeer Femur Question

A fragment of reindeer femur from Castlepook gives this approximate date unusual historical importance. County Cork heritage publications describe it as Palaeolithic, about 31,000 BCE, and zooarchaeologist Ruth Carden has interpreted a deep linear mark on the bone as damage caused when fresh tissue was cut or chopped with a sharp stone tool. If that identification is sustained, the object is potentially the earliest evidence that people handled an animal in Ireland: not a legend of first settlement, but a material trace of carcass processing in the Upper Palaeolithic.

Its implications need careful limits. The published public account supplies an approximate calendar age for the animal bone, rather than a fully reported calibrated range tied to the particular marked specimen. A radiocarbon date records when the animal died, not automatically the instant when the surface mark was made. Most significantly, the femur derives from an old cave collection, not from a

modern, sealed occupation floor. No securely associated stone-tool assemblage, hearth, dwelling, burial, food store, human bone or concentration of butchered remains has yet demonstrated a camp or a resident population at Castlepook around this horizon.

The mark may reasonably invite further investigation because its form has been interpreted as consistent with stone-tool butchery. But a single marked bone cannot establish whether people killed the reindeer, scavenged a carcass, visited briefly, followed herds seasonally, travelled from Britain or another region, or left descendants in Ireland. Nor can it establish that butchery occurred inside the cave. Hyaenas and other carnivores can carry bones into caves, while water and sediment movement can complicate their final resting places. The strongest conclusion is deliberately narrow: Ireland may preserve evidence of human activity in the broad period around 31,285 BCE, but durable occupation has not been demonstrated.

Everyday Life Beyond Recovery

If people did reach Ireland at this time, they would have been highly mobile Upper Palaeolithic hunter-gatherers, dependent on knowledge of animal behaviour, shelter, firewood, stone and seasonal danger. Reindeer could potentially supply meat, fat, marrow, hide, sinew and bone. Such uses are well established in wider Eurasian Palaeolithic contexts, but they remain an inference here rather than a documented Irish practice. Ireland has not yielded a contemporaneous house, tent ring, hearth, flint-working floor or bone tool through which a particular group’s daily routines can be reconstructed.

There is still less basis for describing political affairs. No evidence identifies leaders, territories, alliances, diplomacy, warfare or organised conflict in Ireland at this date. There were no states, written laws or historical institutions that archaeology can name. Likewise, there is no Irish evidence from around 31,285 BCE for religion, ritual places, formal burial, language, music, visual art or systems of learning. This silence should not be mistaken for proof that any visitors lacked culture, social bonds or knowledge. Upper Palaeolithic communities elsewhere in Europe possessed sophisticated technologies and social worlds. It means only that the Irish record cannot responsibly specify them.

Trade is equally beyond demonstration. No imported raw material, exchange good or regular communication network has been securely identified in Ireland from this period. The island’s economy, insofar as it can be discussed, was primarily an ecological one: short-season vegetation feeding grazing animals; large herbivores and smaller mammals moving through open terrain; predators competing for carcasses; and people, if present, seeking opportunities within that demanding system. A reindeer femur can suggest a moment of practical engagement with that landscape; it cannot reveal a market, a polity or a permanent settlement.

Loss, Ice and Survival of Evidence

The later advance of the Irish Ice Sheet is crucial to understanding the scarcity of evidence. Glaciers eroded bedrock and superficial deposits, reworked sediments and altered drainage systems across much of the island. Rising seas after the Ice Age then drowned extensive former coastal plains. These processes may help explain why ephemeral camps, tracks and open-air kill sites from MIS 3 are so difficult to find. They do not, however, licence the invention of a lost Palaeolithic population. Absence of surviving evidence is not proof of absence, but it cannot become proof of a settlement either.

For Ireland around 31,285 BCE, the most important development is therefore not a known reign, battle or migration, but the possibility preserved in a difficult cave archive. Castlepook shows that cold-stage animals occupied at least some Irish landscapes before the ice reached its later maximum. Its reindeer femur raises the prospect that people also entered that world. Future work on intact cave sediments, direct dating, microscopic study of bone surfaces and the recovery of artefacts may strengthen, qualify or overturn that interpretation. At present, deep Irish history begins here not with certainty, but with a carefully examined incision on bone.

Chapter 017 of 100

31284 BCE

Maguirebridge’s Intertill Calendar [17]



31,284 BCE is a modern chronological label, not a year that anyone in Ireland could have named, recorded or remembered. There are no annals, calendars, settlements or human remains that permit an event to be assigned to this particular year. At this depth of time, archaeology works with deposits, fossils and probability ranges. The date falls roughly 33,233 calendar years before the conventional radiocarbon reference year of 1950, within the later part of the Last Glacial Period and broadly within Marine Isotope Stage 3 (MIS 3). It should not be confused with a radiocarbon age of 33,233 BP: radiocarbon measurements must be calibrated because atmospheric carbon-14 levels have varied over time.

A Landscape Between Ice Advances

The closest well-dated Irish environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two distinct layers of glacial till. This sequence offers a clear relative history. Ice had deposited the lower till; during a later ice-free interval, water and organic sediment accumulated; then another advance of ice sealed the deposit below the upper till. It does not provide a diary of 31,284 BCE, but it demonstrates that this part of Ireland experienced dramatic alternations between glacial occupation and open ground.

Organic material from the Derryvree freshwater bed produced a conventional radiocarbon determination of 30,500 +1,170/−1,030 BP. When calibrated, the broad range commonly associated with this determination is approximately 36,900–31,700 cal BP, or about 34,950–29,750 BCE. The editorial year therefore lies inside that large range, but not at a detectable point within the deposit. The responsible

conclusion is limited but important: an ice-free, freshwater environment existed at Derryvree during part of this span. It cannot establish that all of Ireland was ice-free, that every layer formed at once, or that a particular pond existed in the nominated year.

Tundra, Pools and Mosses

Derryvree was not the green, wooded Ireland familiar from later millennia. Its pollen, plant macrofossils and insect remains indicate open tundra and a periglacial climate: ground strongly shaped by frost, short growing seasons and long severe winters. Herbaceous pollen predominates. Mosses, sedges and wet-ground plants grew around shallow freshwater, while the wider terrain was probably sparse and exposed. Small pools, muddy margins and waterlogged patches made up a functioning ecosystem, but not a gentle lakeside landscape. In such conditions, vegetation could be locally productive in summer while remaining treeless and vulnerable to cold winds and frozen soils.

This local evidence matters because later ice movement removed, buried or disturbed much of Ireland’s older surface record. A surviving organic bed beneath till is therefore unusually valuable. It preserves not only a climate signal but signs of biological life—plants and invertebrates whose remains would rarely survive in an exposed upland setting. Comparable Fermanagh sites, including Greenagho and Hollymount, reinforce the conclusion that non-forested, cold-stage environments occurred during the Midlandian glaciation. Yet they also underline regional complexity. Ireland was not a uniform sheet of ice or a uniform grassland; glaciers, wetland basins, exposed slopes and changing coastal zones could coexist across a changing island-scale landscape.

Animals in Southern Caves

Far to the south, Castlepook Cave—also known as Mammoth Cave—near Doneraile in north County Cork provides the principal Irish record of earlier Last Glacial mammals. Its assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, mountain hare, lemmings and spotted hyaena. That list is striking, but it is not a single photograph of one landscape. The bones were accumulated over a long period and by several processes. Carnivores could drag prey or scavenged carcasses into caves; hyaenas could use cave chambers as dens; water, collapse and later disturbance could move or damage material. Early twentieth-century excavations also took place before modern standards of stratigraphic recording and recovery.

Modern re-dating has made Castlepook more significant and more complicated. Carden, Higham and Woodman showed that several dates from Castlepook were between about 5,000 and 12,000 radiocarbon years older than earlier results had suggested, moving crucial elements of the fauna securely into MIS 3. Their results suggest that animals including giant deer and spotted hyaena may have disappeared locally before the later Last Glacial Maximum, around 40,000 calibrated years BP. Thus the cave documents repeated cold-stage animal communities across millennia, rather than proving that mammoths, hyaenas and reindeer all stood together outside the cave during 31,284 BCE.

The presence of large grazing and browsing mammals nevertheless shows that, during favourable intervals, parts of Ireland could sustain more life than the phrase “Ice Age” implies. Reindeer point to open, cold-adapted environments; mammoths and giant deer imply substantial seasonal forage; hyaenas and wolves reveal a food web containing large carnivores and carrion. The animals must have reached Ireland through a north-west European landscape whose coastlines, sea levels and ice margins differed

greatly from those of today. Exactly which routes were available at each moment remains unresolved. Lower sea levels did not automatically create a simple, continuous land bridge, and advancing ice could both open and close practical pathways.

The Reindeer Femur Question

One Castlepook object has particular importance for human history: a reindeer femur reported in 2021 as approximately 33,000 years old and bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage from a sharp stone tool during butchery. If that interpretation is confirmed, it would be Ireland's earliest known indication that people handled an animal, extending the island's possible human story far beyond the established terminal Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

The qualification is essential. The femur is not a discovered camp floor, and its date is not a date for the incision alone. It dates the death of the animal within a scientific range; it does not reveal whether the carcass was hunted locally, how soon the bone was marked, or whether people stayed in the vicinity. There is no securely associated stone-tool assemblage, hearth, shelter, burial, dwelling surface or group of butchered remains at Castlepook of this age. Marks on bone require careful comparison with damage caused by teeth, trampling, breakage, sediment movement, weathering and excavation. The reported femur is therefore promising evidence of possible human activity, not proof of permanent settlement or an unbroken population in Ireland. Recent work at Castlepook is explicitly directed towards finding undisturbed deposits and testing these questions.

No Kingdoms, No Proven Trade

There is no evidence for political communities, leaders, diplomacy, warfare, territorial boundaries or formal religion in Ireland at this date. Nor is there evidence for farming, stock-keeping, metalworking, pottery, exchange networks or permanent villages. It would be misleading to turn the movements of animals—or a possible episode of carcass processing—into a story of tribes, rivalries or named peoples. The archaeological record cannot identify an Irish language, a ritual tradition, artwork or system of learning from this period.

If people did visit Ireland during this broad MIS 3 interval, the best comparison is with highly mobile Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe. Their immediate concerns would have been warmth, dry shelter, fuel, safe travel, weather and access to food, not the institutions of later history. A reindeer carcass, if processed by people, could have supplied meat, marrow, hide, sinew and bone. That is a plausible interpretation of subsistence behaviour, but it remains an inference from one disputed object rather than evidence for a local economy. The cave itself may have been used principally by animals, not humans.

An Archive, Not an Anniversary

The most meaningful development around 31,284 BCE is therefore environmental rather than political. Ireland contained, at intervals, cold open habitats with freshwater wetlands in Fermanagh and a diverse large-mammal fauna in the south. It lay in a dynamic zone of repeated climatic shifts, changing

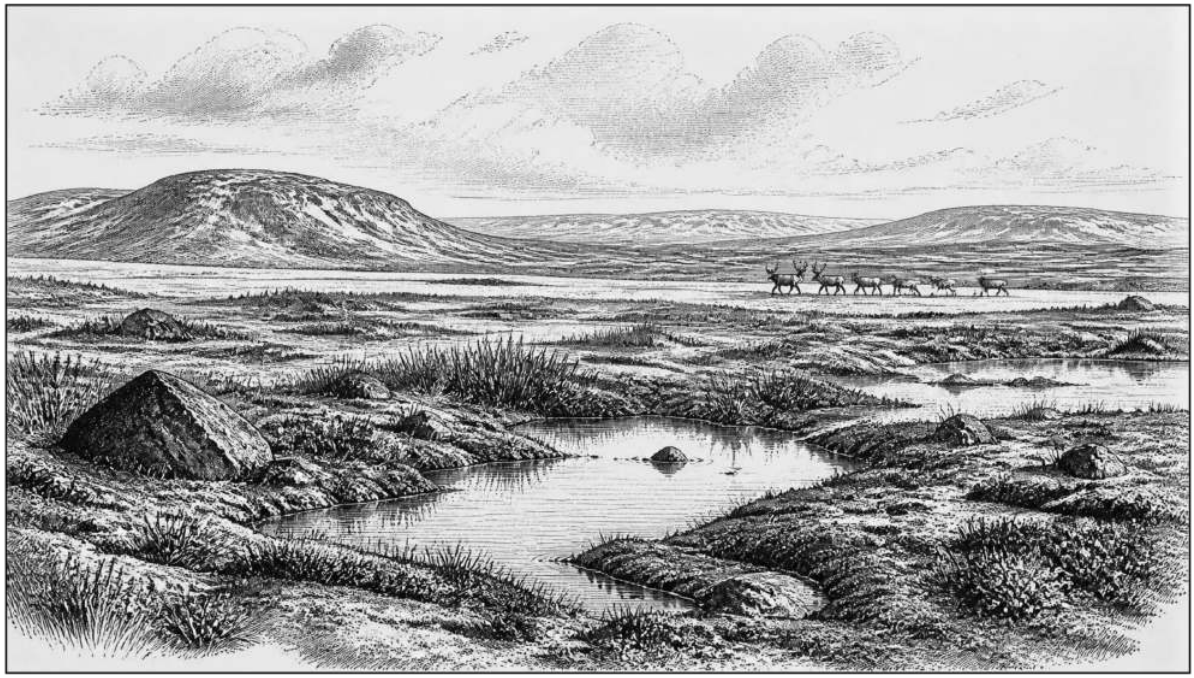
ice margins and altered coastlines. The larger British–Irish Ice Sheet reached its major Late Glacial extent later, while reconstruction of its growth and retreat shows why no simple map of an eternally frozen Ireland is credible.

Derryvree’s silts and Castlepook’s bones are not monuments to a single year. They are fragile archives of processes: water flowing between glacial episodes, plants growing on frost-affected ground, animals moving through changing habitats, predators accumulating bone, and perhaps humans briefly entering the record. The absence of a dense archaeological signature is itself significant. For now, the evidence supports a Pleistocene Ireland intermittently habitable for animals and possibly visited by people, but not a demonstrable settled society. Future excavation, refined dating, taphonomic study and analysis of cave sediments may alter that judgement. Until then, this is a history best told in calibrated ranges and carefully separated possibilities.

Chapter 018 of 100

31283 BCE

Derryvree’s Buried Herbarium [18]



The label 31,283 BCE is a modern way of placing a very remote point in time; it is not a year that can be recovered from Ireland’s archaeological record. No Irish community then kept a written calendar, and no surviving deposit can resolve events to a particular twelve-month period. In the conventional system that counts backwards from AD 1950, this date is about 33,232 calendar years before present. It falls within the later part of Marine Isotope Stage 3 (MIS 3), a long, climatically unsettled phase of the last Ice Age. The responsible history of Ireland at this horizon is therefore not a chronicle of rulers, battles or named peoples, but a cautiously assembled account of changing ice, wetland plants, animals and a disputed trace of possible human activity.

Calendar precision is especially impossible at this depth of time. Radiocarbon years are not identical to calendar years because the amount of radiocarbon in the atmosphere has varied. Modern calibration curves improve the conversion, but they produce probability ranges, not exact dates, particularly for samples approaching 30,000 radiocarbon years old. The evidence can illuminate a broad interval around the early thirty-second millennium BCE; it cannot identify what happened in Ireland in the particular modern year 31,283 BCE.

A Country in an Unstable Ice Age

Ireland was part of a North Atlantic world in which climate changed sharply over millennia and sometimes more abruptly. MIS 3 preceded the Last Glacial Maximum, the later phase when the British–Irish Ice Sheet expanded most extensively across Ireland and its continental shelf. Yet it would be misleading to imagine a simple progression from a green island to uniform ice. Glaciers advanced and retreated at different times in different regions. Areas of ice, bare periglacial ground, waterlogged hollows, river valleys and cave country could coexist within a shifting landscape.

The later ice sheet also explains why evidence is so scarce. Moving ice eroded older surfaces, transported sediment and redeposited it as till; meltwater altered valleys and buried earlier landforms. Low sea levels transformed the surrounding shelves, while subsequent inundation concealed or destroyed former coastal landscapes. Ireland’s present outline, coastlines and county boundaries have no direct relevance to this period. Even so, lower sea level must not be turned into a simple story of a permanent, dry land bridge from Britain or continental Europe. The extent of exposed ground, ice barriers, water crossings and viable routes varied through time and remains the subject of palaeogeographical reconstruction.

Freshwater Between Two Glaciers

The clearest Irish environmental archive relevant to this date was found at Derryvree townland, near Maguiresbridge in County Fermanagh. Road excavation in 1969 cut through a drumlin and exposed a remarkable sequence: freshwater silts and fine sands, including organic material, lay between two thick and distinct sheets of till. In simple terms, ice had deposited the lower till; a subsequent non-glacial interval allowed water and organic sediments to accumulate; then a later glacier overran and sealed the deposit beneath the upper till. The stratigraphy is powerful evidence for major environmental change, although it is local evidence and cannot by itself map conditions across all Ireland.

The Derryvree organic layer produced a radiocarbon determination of 30,500 +1,170/−1,030 radiocarbon years BP. It has been assigned broadly to the Middle Midlandian, generally correlated with MIS 3. When expressed through modern calibration, discussion of this result yields a wide calendar bracket of approximately 36,900–31,700 cal BP, or roughly 34,950–29,750 BCE. The modern label 31,283 BCE lies close to, but just later than, that illustrative bracket; uncertainties in old determinations, calibration and correlation mean that it should not be used to declare the Derryvree wetland either certainly present or certainly absent in that exact year. The deposit is relevant because it records the wider kind of late-MIS-3 world into which this date falls, not because it provides an annual snapshot.

Mosses, Sedges and Shallow Water

The Derryvree flora and fauna demonstrate that at least this part of Fermanagh supported an ice-free freshwater environment during one cold-stage interval. Pollen was poorly preserved, but herbaceous types were identified; plant macrofossils included mosses, while the wider assemblage indicated sedges, aquatic and wet-ground vegetation. Researchers interpreted the setting as open tundra or muskeg: predominantly treeless, wet ground with shallow pools, saturated margins and seasonally constrained growth. Occasional grains of tree pollen do not demonstrate a local forest; they may have travelled far or been reworked from older material.

This was not a featureless frozen desert. Water, mud, moss and herb vegetation sustained invertebrates and created small ecological niches. But nor should it be romanticised as a familiar lakeside meadow. The evidence supports harsh, exposed and periglacial conditions, probably with frozen ground influencing drainage and soil development. Trees that dominate later Irish landscapes—oak, elm, hazel and ash—were absent from this record. A short growing season, persistent cold and physical disturbance by frost would have limited plant cover on drier ground. Differences of slope, shelter, groundwater and snow accumulation may nevertheless have produced locally richer patches of forage.

The wider North Atlantic climate reinforces the need for caution. Greenland ice cores show that MIS 3 was marked by marked millennial-scale swings between colder stadials and relatively milder interstadials. Irish sediments are not sufficiently precise to assign 31,283 BCE confidently to a particular Greenland event. The sensible conclusion is narrower: Ireland’s climate and habitats were unstable on long timescales, and a landscape suitable for wetland vegetation and grazing animals could be altered profoundly by renewed cooling and ice advance.

Animals in the Cave Archive

County Cork offers a second, very different window. Castlepook Cave, also called Mammoth Cave, near Doneraile has yielded one of Ireland’s richest collections of Pleistocene animal remains. Material attributed to the wider pre-Last Glacial Maximum fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. A spotted-hyaena skull from the cave is held by the National Museum of Ireland. These species demonstrate that, during portions of the period, Ireland belonged ecologically to the cold-adapted north-west European world.

They do not establish that every listed species lived together at Castlepook in 31,283 BCE. Cave collections often combine remains accumulated at different times. Carnivores may have dragged carcass parts into dens; animals can die in caves or fissures; water, collapse and excavation may mix bones. Much of the Castlepook material was recovered during early twentieth-century work, before modern recording standards. Recent reassessment has shown that older radiocarbon measurements from Irish cave bones can be unreliable when compared with results obtained through improved pretreatment and accelerator dating. The cave is consequently an indispensable archive, but not a ready-made scene of one day’s hunting or one season’s wildlife.

For everyday life in the animal world, reindeer are particularly evocative. If herds used suitable Irish terrain, they would have converted sparse vegetation into mobile stores of meat, fat, hides, sinew, antler and bone for predators and, potentially, people. Hyaenas, wolves and bears indicate competition and scavenging as well as hunting. Mammoth remains show that very large herbivores reached Ireland during some pre-LGM phases. Yet animal bones tell us more securely about presence and environment than about population size, migratory routes or the stability of any local herd.

The Reindeer Femur Question

A reindeer femur from Castlepook has made this remote period especially important. The bone has been publicised as about 33,000 years old and carries a deep linear mark that zooarchaeologist Ruth Carden has interpreted as damage made by a sharp stone tool during carcass processing. If that interpretation is confirmed, it would provide potentially transformative evidence that Upper Palaeolithic people handled a reindeer in Ireland long before the formerly accepted post-glacial evidence for human presence.

Its limitations must be stated as firmly as its promise. The radiocarbon result dates the animal’s death, not automatically the cutting episode. The identification of a mark as a human tool cut is a specialist taphonomic judgement that must distinguish deliberate modification from carnivore damage, sediment abrasion, breakage or excavation damage. Most importantly, the femur was not recovered from a securely recorded camp floor with associated tools, hearths, butchered bone assemblages, shelters or human remains. The finding may indicate a brief human visit or processing event; it does not demonstrate a permanent Irish population, a settlement, a hunting territory or continuity between generations.

No Polities, No Proven Communities

There is no evidence from around this date for political institutions, diplomacy, warfare, territorial lordship or named leaders in Ireland. There are likewise no demonstrable houses, villages, graves, food stores, art objects, ritual monuments or learning traditions. It would be anachronistic to describe any possible visitors as an Irish people in an ethnic or national sense. If people did reach the island, the most plausible comparison is with highly mobile Upper Palaeolithic hunter-gatherers known elsewhere in north-west Europe, but that is an interpretation from neighbouring evidence, not a documented Irish social system.

The same restraint applies to economy and trade. There is no securely dated Irish lithic assemblage, imported material, exchange network or settlement evidence from this horizon. A possible butchered reindeer could suggest the practical use of animal resources, but cannot show whether animals were hunted locally, scavenged, processed by a travelling party or encountered through some other circumstance. Nor is there evidence for farming: cultivation, domestic livestock and pottery belong to vastly later chapters of Irish prehistory.

A Landscape Rather Than a Year

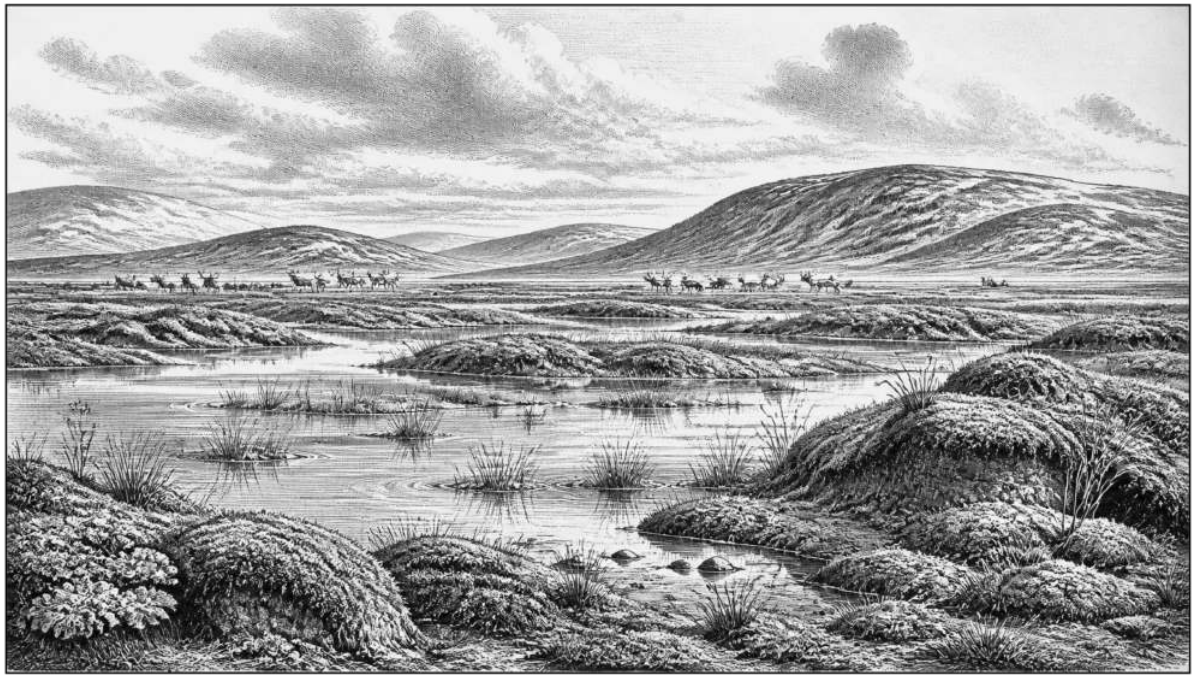
The most important development around 31,283 BCE was environmental. The Derryvree deposits preserve a cold freshwater tundra landscape during the broader late-MIS-3 interval; Castlepook preserves compelling proof that Ice Age mammals reached southern Ireland during pre-LGM phases; and one marked reindeer femur raises, but does not settle, the possibility of an early human visit. Growing ice would later erase much of the surface record and impose an even more formidable barrier to life and movement.

That fragmentary evidence is not a deficiency to be filled with invented chiefs, camps or ceremonies. It is the history available: mosses sealed beneath glacial sediment, bones in limestone caves, calibrated ranges and arguments tested by new methods. Around this modern date label, Ireland was a changing Pleistocene landscape whose ecological connections were real, whose human story remains uncertain, and whose surviving traces demand careful reading.

Chapter 019 of 100

31282 BCE

Fermanagh Silt, Cork Bone [19]



The label 31,282 BCE gives an illusion of precision that the evidence cannot sustain. No Irish deposit, artefact, animal remain or human action can be dated responsibly to that single modern calendar year. It is better understood as a point roughly 33,230 years before AD 1950, in the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. Radiocarbon measurements of this antiquity produce broad probability ranges after calibration, not annual dates. The historical task is therefore to reconstruct the Ireland of a wider horizon, while being candid about what is observed, what is inferred, and what remains unknown.

A Date Within Ranges

Modern calendar years are especially awkward at this depth in time. Archaeologists conventionally count radiocarbon years ‘before present’, where ‘present’ means AD 1950; those measurements must then be calibrated because atmospheric carbon-14 levels varied. The internationally used IntCal20 curve extends back far enough to calibrate much of this period, but it does not transform an ancient measurement into a diary date. At around 33,000 calendar years ago, its form and the error margins of old assays mean that several centuries, and sometimes millennia, may fall within a quoted range.

The requested year belongs broadly to the later part of MIS 3, before the fullest growth of the last British–Irish Ice Sheet. That does not mean a uniformly ice-free Ireland. Ice sheets expand and contract unevenly, and the evidence from one valley, cave or offshore core cannot simply be spread across the entire island. The best current reconstructions place substantial build-up of the British–Irish Ice Sheet after roughly 35,000–32,000 years ago, with its principal maximum later, around 27,000–21,000 years ago. Around this article’s notional date, Irish landscapes were already being shaped by severe cold, changing ice margins and major shifts in sea level, but regional conditions were varied.

Freshwater Beneath Derryvree

The most illuminating Irish environmental record close to this horizon lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed an extraordinary sequence: freshwater silts, fine sands and organic deposits lay between two distinct tills, the unsorted debris left by glacier ice. Its basic story is secure. An earlier ice advance deposited the lower till; then, during a non-glacial interval, water and organic material accumulated; finally, a later advance covered the deposits with fresh glacial sediment.

The Derryvree organic bed yielded the radiocarbon determination BIRM-166, conventionally about 30,500 ± 1,170 radiocarbon years before present. Published calibrations place it broadly between about 36,900 and 31,700 calibrated years before present, or approximately 34,950–29,750 BCE. Thus 31,282 BCE falls within the wide environmental interval represented by the deposit, but it cannot be assigned to a particular season, water level or living plant. Nor does the deposit prove that every region of Ireland had identical conditions at the same time.

What it does preserve is unusually valuable. Pollen, plant macrofossils, mosses and invertebrate remains indicate freshwater and wet ground within a cold, largely open landscape. The vegetation was not the familiar blanket of oak, elm and hazel woodland associated with later Irish prehistory. Herbaceous pollen and cold-adapted plant evidence point instead towards tundra or tundra-steppe conditions: sedges, mossy ground, sparse dry-land cover and pools or slowly moving water. A few grains of tree pollen should not be made into evidence for nearby forest; at such a site they may have travelled a great distance or been redeposited.

An Open, Severe Island

Derryvree makes the Ice Age landscape tangible. In southern Fermanagh, low ground could sustain a waterlogged mosaic despite harsh temperatures: shallow water, silty margins, damp mosses and sedge-rich patches. Elsewhere, exposed ground was likely subject to frost action, powerful winds and a strongly seasonal climate. The word ‘tundra’ should not imply a featureless white wilderness. It describes an open and often productive set of habitats, although their appearance changed with relief, drainage, season and the proximity of ice.

At the scale of the island, Ireland was part of a much larger north-west European land-and-sea world. Global sea level was lower than today because enormous quantities of water were held in continental ice sheets. The present shorelines, islands and shallow seas did not define movement in the way they do now. Yet it would be irresponsible to draw a simple land bridge from Ireland to Britain and call it the route taken by every animal or person. Ice, rivers, lakes, exposed shelves and marine channels changed through time. The evidence supports ecological connection between Ireland and neighbouring regions during parts of the period, not a mapped route for a specific journey in 31,282 BCE.

The later glacial record demonstrates how dramatic the regional change would become. During the Last Glacial Maximum, ice extended widely across Ireland and its surrounding continental shelf, while the Irish Sea Ice Stream reached far south across the Celtic Sea. These later advances are central to understanding why early terrestrial landscapes and campsites are so elusive: advancing ice eroded, mixed, buried or removed deposits. The rarity of Palaeolithic evidence in Ireland is therefore not proof that all earlier human visits were impossible; it is also a consequence of an exceptionally destructive geological archive.

The Castlepook Reindeer Bone

The most direct, though still limited, possible evidence for people near this time comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Antiquarian excavations there between 1904 and 1908 recovered a remarkable accumulation of Ice Age animal remains. The National Museum of Ireland regards Castlepook as Ireland's most important site for mammal remains from the last cold stage. Its fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hares, lemmings and spotted hyena. The cave was not a peaceful living room preserved in time; it was a complex natural trap, shelter and carnivore-affected bone archive.

A reindeer femur from the old Castlepook collection has been dated broadly to about 31,000 BCE and bears a deep surface incision. Zooarchaeologist Ruth Carden has interpreted the mark as damage made by a sharp stone tool during carcass processing. If that interpretation is confirmed, it would indicate that Upper Palaeolithic hunter-gatherers reached Ireland roughly 33,000 years ago, far earlier than the previously accepted late-glacial evidence for human activity. It is a major possibility, not a complete settlement narrative.

The cautions matter. The bone comes from an old collection whose original contexts were disturbed, and the Castlepook deposits were repeatedly re-sorted by water and affected by carnivores. The radiocarbon date measures the death of the animal, not automatically the instant at which any mark was made. No securely associated stone toolkit, hearth, butchered assemblage, human skeleton or occupation surface of this age has yet been recovered in Ireland. Excavation in 2022 sought surviving Pleistocene deposits and demonstrated that sediments remain in parts of the cave, but it did not furnish a complete answer to the question of early human presence.

People as Possibility, Not Polity

If the Castlepook incision is human-made and contemporary, the people behind it were almost certainly highly mobile hunter-gatherers, not inhabitants of villages or members of a named Irish people. Reindeer would have offered meat, fat, hides, sinew, antler and bone; a successful carcass-processing episode could have been economically important. The animal may have been killed or initially butchered in the open before portions were carried, scavenged or washed into the cave. That is a reasoned interpretation of the evidence, not a known story of a hunt.

There is no evidence from Ireland at this date for permanent houses, fields, livestock, pottery, metalwork, monuments, writing, formal political institutions or long-distance trade networks. Nor can political affairs, warfare, diplomacy, law or leadership be recovered from a single possible cut-mark. Predators and scavengers certainly competed with people and herbivores for carcasses and shelter, but this was ecological pressure, not demonstrable human conflict. Ireland had no recorded rulers and no known borders. To impose later ideas of tribe, kingdom or nation upon this interval would be misleading.

Religion, culture and learning are similarly beyond direct recovery. A stone-tool cut could attest skill, anatomical knowledge and a shared practical tradition, but it cannot reveal language, ritual, kinship or belief. The absence of evidence is not evidence that Ice Age visitors lacked social worlds; hunter-gatherer societies elsewhere plainly possessed complex knowledge and relationships. It means only that Ireland has not preserved material evidence which allows those worlds to be described here with confidence.

A Landscape Before the Archive

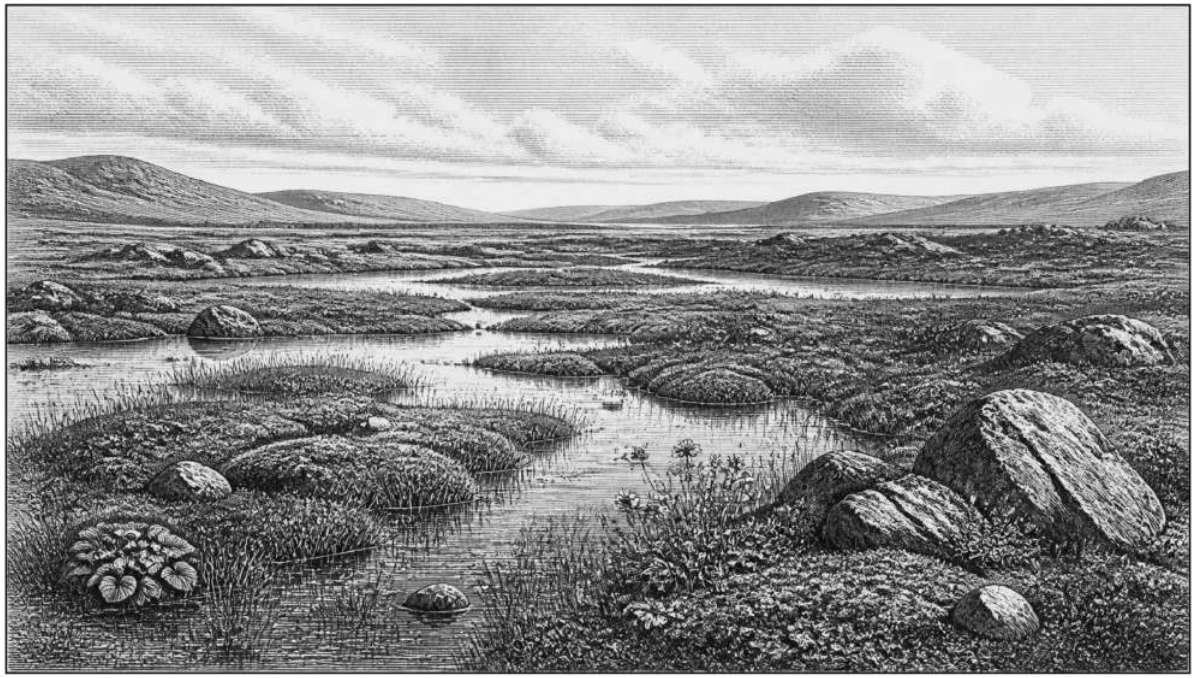
For 31,282 BCE, the essential Irish development is environmental rather than political: a cold, changing island within the gathering power of the last glaciation. Derryvree gives firm evidence for exposed periglacial wetland and open vegetation during a broad interval that encompasses this notional date. Castlepook gives strong evidence for an Ice Age fauna and a provocative, carefully qualified indication that people may have processed reindeer in Ireland. Together they replace an older picture of a wholly empty, uniformly frozen island with something more complex: habitats capable of supporting animal communities, perhaps visited by human hunters, but repeatedly altered and largely erased by ice.

That incompleteness is itself historical evidence. Ireland’s deep past survives in silts trapped below drumlins, bones from fissured limestone caves, laboratory dates and the re-examination of museum collections. The responsible account of this year is not an invented event. It is a recognition that, long before farming, monuments or written memory, Ireland occupied a precarious Ice Age frontier whose most important witnesses are a Fermanagh freshwater bed and a marked reindeer bone from Cork.

Chapter 020 of 100

31281 BCE

Derryvree’s Ancient Bogbean [20]



31,281 BCE is a modern calendar label, not a year that can be recovered from Ireland’s archaeological record. Nobody in Ireland counted time in this way, and no excavation, fossil deposit or radiocarbon determination can identify an event that happened in this particular twelve-month span. In radiocarbon terms it lies roughly 33,230 years before AD 1950; in broader archaeological language it belongs to the later part of Marine Isotope Stage 3, within the Middle Midlandian cold-stage sequence used for Ireland. The responsible subject is therefore an interval, not an annal: a cold and increasingly unstable Pleistocene Ireland glimpsed through buried sediments, animal bones and the changing geometry of ice.

The evidence is both precious and limited. Later glaciers repeatedly eroded, redeposited or concealed older ground surfaces, while early cave excavations did not always preserve the stratigraphic information expected today. What survives can nevertheless show that parts of Ireland contained ice-free landscapes, freshwater habitats and sizeable mammals before the Last Glacial Maximum. It cannot identify a named people, polity, language, religion, settlement or campaign. This was long before the beginnings of the securely documented human story of Ireland.

Between Two Ice Advances

The most informative Irish environmental archive close to this notional date is Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed an unusual sequence: organic freshwater silts and fine sands enclosed between two tills. Till is sediment left by glacier ice. The arrangement therefore records an important local sequence—glaciation, an ice-free interval in which water and vegetation accumulated sediment, and then renewed glaciation which sealed the deposit.

Organic material from the Derryvree bed produced the radiocarbon determination BIRM-166, conventionally reported as 30,500 ± 1,100 radiocarbon years BP. A radiocarbon age is not identical to a calendar age. When assessed through modern calibration, the deposit falls within a wide range, approximately 36,900–31,700 calibrated years BP. Thus 31,281 BCE falls near the younger end of an interval represented by the deposit, but cannot be attached to a specific season, landscape episode or human lifetime. The range is more historically honest than false precision.

Derryvree also warns against imagining a uniform Irish climate. It is a highly local record from one lowland site in Fermanagh, not a thermometer for the entire island. Yet its position between tills proves that this locality was not continuously ice-covered through the relevant span. The later advance that capped the sediments also demonstrates how vulnerable such habitable patches were as colder conditions intensified.

A Wetland in Open Country

Plant macrofossils, pollen and insect remains from Derryvree indicate a treeless, cold landscape with wet ground rather than a forested version of modern Ireland. Finds include mountain avens (*Dryas octopetala*) and bogbean (*Menyanthes trifoliata*), alongside mosses, sedges and other plants capable of growing in open, waterlogged or periglacial conditions. These are material traces, not artistic impressions: seeds, pollen grains and small biological remains preserved in sediment. Together they support the interpretation of a freshwater marsh or muskeg-like environment amid tundra or tundra-steppe vegetation.

Such a place would have changed with season. During brief summers, shallow pools, saturated margins and sedge-rich ground could have supported insects and water plants. In winter, frost, wind and snow would have imposed severe constraints. The country was probably largely open, with low vegetation rather than closed woodland, and with soils vulnerable to freeze-thaw disturbance. “Periglacial” does not mean permanently buried under ice; it describes ground shaped by intense cold at or near an ice margin.

There is no basis for reconstructing houses, campsites, fields, paths or cultivated land at Derryvree in 31,281 BCE. The wetland record instead supplies the environmental setting within which animals—and conceivably transient people—might have moved. It also preserves a feature of prehistoric Ireland that later history often obscures: freshwater habitats existed within a landscape repeatedly transformed by advancing ice.

Animals Before the Maximum

Southern Ireland offers a different, cave-based record. Castlepook Cave, near Doneraile in north County Cork, is associated with a substantial collection of Pleistocene animal remains, much of it recovered during antiquarian investigations in the early twentieth century. Studies of Irish Quaternary fauna show that a wide range of mammals reached Ireland sometime between at least about 45,000 and 20,000 years ago. Castlepook material includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena.

These species must not be turned into one frozen tableau. Cave assemblages can accumulate over long periods, and individual bones may have different ages and depositional histories. A hyaena den, carnivore scavenging, water movement, collapse, later disturbance and the practices of early excavators

can all complicate the record. The assemblage does, however, establish that Ireland formed part of a wider north-west European world in which cold-adapted and large grazing mammals could reach suitable terrain before the height of the last glaciation.

The animals imply ecological relationships rather than a simple list of curiosities. Reindeer could exploit open vegetation; mammoths and giant deer required substantial forage; hyaenas and wolves were predators or scavengers within the same broad food web. Their presence demonstrates biological connectivity with Britain and continental Europe during periods of lowered sea level and changing ice conditions. It does not prove that a stable land bridge existed at every moment, nor that any particular species crossed by one route alone.

The Castlepook Reindeer Question

A reindeer femur from the Castlepook collection has made this period especially important. Reassessment and accelerator radiocarbon dating have been publicly associated with an age of about 33,000 years ago, while a deep mark on the bone has been interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone implement during carcass processing. If that interpretation is confirmed, it would be striking evidence that a person handled a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the long-established record of post-glacial settlement.

But the conclusion requires caution. A dated bone establishes the age of the animal, not automatically the date or cause of every mark on its surface. Distinguishing a genuine stone-tool cut from natural abrasion, trampling, carnivore damage or excavation damage depends on microscopic form, placement and taphonomic context. Moreover, the old Castlepook deposits were disturbed and most were removed long ago. One possible butchery mark cannot demonstrate a village, a resident population, a migration route, or cultural continuity into later Irish prehistory.

The proper historical formulation for around 31,281 BCE is therefore deliberately modest: Ireland had an environment capable of supporting large Ice Age mammals, and a reindeer bone offers a serious but still limited possibility of human activity. Continued work at Castlepook, including new excavation, re-examination of museum collections, improved radiocarbon dating and sedimentary ancient-DNA research, may sharpen that picture. It should not be made to answer questions for which the evidence is presently too slight.

No Polities, No Proven Communities

Political affairs, diplomacy and warfare cannot responsibly be narrated for Ireland at this depth in time. There are no rulers, tribes, treaties, territories or battle sites known from the island in this interval. Equally, there is no direct evidence for formal religion, ritual monuments, visual art, spoken language, teaching traditions or named cultural identities. The imposing ritual landscapes often associated with prehistoric Ireland—passage tombs, henges, hillforts and medieval churches—belong tens of thousands of years in the future.

Nor can economy and trade be described in their usual historical sense. There is no evidence for farming, herding, pottery, metalworking, exchange networks or managed woodland. If people did enter the island, they would have done so as highly mobile hunter-gatherers using perishable equipment and stone technology comparable in broad principle to Upper Palaeolithic groups elsewhere in Europe. Yet no securely stratified Irish lithic assemblage has been demonstrated for this date. This is a plausible comparative framework, not direct proof of Irish daily life.

An Island Becoming Harder to Inhabit

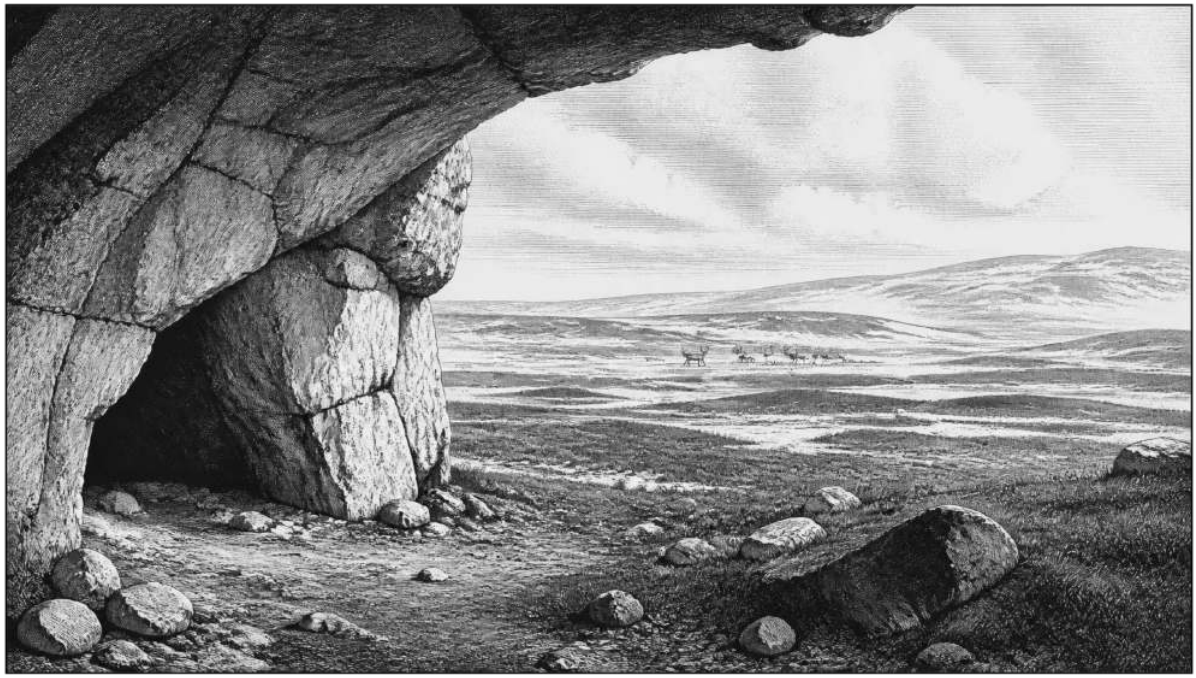
The great development of the wider period was climatic deterioration. The Last Glacial Maximum had not yet reached its fullest extent—its principal maximum lay later, roughly 26,000–20,000 years ago—but the British–Irish Ice Sheet was beginning a rapid phase of growth. Reconstructions indicate that a Scottish-centred ice mass was advancing around 32,000–31,000 years ago and that the wider ice sheet expanded dramatically thereafter. Conditions in and around Ireland were consequently changing on timescales far larger than a single calendar year.

At 31,281 BCE, then, Ireland was neither simply an empty white ice sheet nor a temperate green island. It was a changing frontier of open ground, wetland, animal movement and encroaching ice. Derryvree's bogbean and mountain avens preserve one local moment of life in that frontier; Castlepook's bones preserve another, geographically distant record of its fauna. Together they reveal an Ireland with ecological potential but fragile habitability, on the eve of a glacial transformation that would erase much of the evidence it left behind.

Chapter 021 of 100

31280 BCE

Castlepook’s Vanishing Reindeer [21]



A numbered year such as 31,280 BCE offers a useful point on a modern timeline, but it cannot describe a dated Irish event. No written calendar existed, and no archaeological deposit in Ireland can be assigned responsibly to that single year. In calendar terms it lies roughly 33,230 years before AD 1950, conventionally expressed as about 33.2 thousand calibrated years before present (cal BP). Even that conversion is approximate: radiocarbon ages require calibration, calibration ranges widen at this depth of time, and deposits may record intervals rather than moments. The sound historical question is therefore not ‘what happened in Ireland that year?’ but what evidence illuminates Ireland in the surrounding millennia.

A Late Pleistocene Threshold

This was the Late Pleistocene, within the later part of Marine Isotope Stage 3 (MIS 3), a long glacial phase distinguished not by unbroken cold but by abrupt climatic swings. Greenland ice cores provide the best-dated North Atlantic sequence, showing repeated transitions between colder stadials and relatively milder interstadials over centuries or millennia. Ireland was closely exposed to those Atlantic changes, yet its own terrestrial archive is sparse, discontinuous and repeatedly disturbed by later ice. It would be unsafe to identify conditions in one Irish valley, let alone across the island, for 31,280 BCE itself.

The global Last Glacial Maximum still lay ahead. It is normally placed at about 26.5–19 thousand years ago, while the British–Irish Ice Sheet reached maximum extent at different times in different sectors. Recent reconstructions show growth, advance and retreat were asynchronous, not a single simultaneous freezing-over. Around 33.2 cal ka BP, the island belonged to a changing glacial world in which ice had

already existed and expanded in earlier phases, but the fullest late-glacial configuration had not yet been achieved. This distinction matters. The familiar image of all Ireland buried beneath an LGM ice sheet should not automatically be projected backwards several thousand years.

Ice, Sea and Uneven Ground

The physical Ireland of this period cannot be reconstructed as a fixed map. Research on raised beaches along the south coast, including at Fethard in County Wexford, has produced optically stimulated luminescence dates broadly within MIS 4–3 rather than a much older interglacial. Those deposits, together with evidence of glacial loading and ice-rafted debris in Atlantic cores, indicate that large ice masses affected the region before the later maximum. A recent review argues for dynamic advance–retreat phases during MIS 3. It also stresses the limits of the evidence: no directly dated Irish till establishes precisely where the ice margin stood at 33.2 cal ka BP.

Accordingly, one interpretation is that substantial Irish-centred ice may have occupied parts of the island and adjacent seas during colder phases, while other areas remained exposed at other times. This is an interpretation from landforms, sediments, sea-level indicators and regional comparisons, not an observed landscape. Whether any particular southern lowland was open tundra, glacier margin, cold coastline or temporarily inaccessible terrain depends on the timing of advances that current evidence cannot resolve to a calendar year.

Sea level was lower globally than today because more water was locked in land ice. Yet local relative sea level did not simply follow the global figure. The weight of ice depressed the Earth’s crust, so portions of the Irish coast could experience relative sea levels shaped by glacio-isostatic adjustment as well as ocean volume. The Irish Sea was therefore not a simple dry corridor on which people and animals could be assumed to have walked. Routes between Ireland, Britain and the continental shelf changed with ice, water, shorelines and seasonal conditions. Faunal movement proves that crossings occurred in suitable periods; it does not reveal the exact route or season.

Castlepook Cave’s Faunal Archive

The most important directly Irish evidence for this broad interval comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations conducted in the early twentieth century recovered a remarkable concentration of animal remains, now principally associated with the National Museum of Ireland. The cave is Ireland’s richest known vertebrate archive for the period leading towards the Last Glacial Maximum. Its documented fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; later cave deposits preserve a different cold-adapted set including lemmings, Arctic fox and wolf.

Those bones do not mean that all these animals lived together at one instant, nor that every species belongs near 31,280 BCE. Caves accumulate material over long spans. Hyenas can carry carcass parts into dens; flowing water can rework sediment and bone; nineteenth- and early twentieth-century excavation methods did not create the fine-grained stratigraphic records expected today. Castlepook’s original excavators recognised a complicated sequence of chambers and deposits, but later reassessment has underlined how difficult it is to match individual fossils to a single episode.

Modern radiocarbon redating has nonetheless transformed its importance. It indicates that some Castlepook fauna belongs to MIS 3, substantially earlier than earlier determinations suggested. In broad terms, spotted hyenas and other mammals reached Ireland during a period roughly between 45,000 and

30,000 years ago. This makes a reindeer, mammoth and predator landscape historically plausible in the wider interval around the requested date. It does not establish a herd, a hyena clan or a particular mammoth beside Castlepook in 31,280 BCE. The responsible picture is of intermittent animal populations exploiting an environmentally variable Ireland.

People: A Possible, Not Settled, Presence

There is a tantalising claim of human activity at Castlepook: a reindeer femur reportedly bearing marks interpreted as made by a stone tool, associated in public reporting with an age of about 33,000 years. If that interpretation is sustained by full publication, direct dating and contextual study, it would be exceptionally important: it would indicate a human presence in Ireland tens of millennia before the well-known post-glacial settlement record. At present, however, it cannot support a detailed story of a named community, camp or hunt in this specific year.

No securely associated hearth, stone-tool assemblage, dwelling floor, human burial, art panel or food-processing area of this age has been recovered from Castlepook. Nor can a single modified bone demonstrate permanent occupation. The safest inference is modest: people may have reached Ireland during a favourable MIS 3 interval and processed a reindeer, but the duration, frequency, size and origin of any visiting group remain unknown. They may have been highly mobile Upper Palaeolithic hunter-gatherers operating across a larger north-west European landscape; that is a reasonable comparison, not evidence for an Irish population.

The contrast with later evidence is instructive. A cut-marked brown-bear bone from Alice and Gwendoline Cave in County Clare has independently calibrated dates of about 12,810–12,590 cal BP, while the early Mesolithic camp at Mount Sandel was occupied much later, about 10,290–9,790 cal BP. These finds demonstrate separate episodes after the Last Glacial Maximum, not continuity from any MIS 3 visitors. Ireland’s earliest securely documented sustained settlement belongs to the post-glacial world, not to the time of Castlepook’s older fauna.

Daily Life Without a Society

Because the human evidence is so slight, political affairs, diplomacy, leadership, war and formal religion are beyond recovery. There are no settlements from which to infer territorial authority, no weapons assemblages from which to identify conflict, and no monuments or burials that could illuminate ceremonial life. It would be misleading to fill this silence with generic ‘cave people’, clans, shamans or tribal warfare. A cave holding animal bones is not itself evidence that humans lived in it, and Castlepook’s hyena remains make a non-human use of the cave especially important.

What can be discussed is subsistence as a conditional possibility. Reindeer, giant deer and mammoth would have been substantial sources of meat, fat, hide, sinew, bone and antler for any people able to obtain carcasses. But the evidence cannot distinguish hunting from scavenging, occasional butchery from repeated visits, or local acquisition from carcasses moved by carnivores. There is no demonstrable trade network, farming, pottery, metalworking or exchange economy. If humans were present, their economy was almost certainly based on immediate access to wild resources and extreme mobility, but even this describes an inferred adaptation rather than an excavated Irish household.

A Landscape Preserved in Fragments

Climate, vegetation and animal life form the real history of Ireland around this date. Open, cold environments were capable of supporting grazing mammals, and the cave fauna confirms that Ireland was not biologically empty throughout the wider MIS 3 interval. Yet ‘mammoth steppe’ should be used carefully. It is a useful broad comparison for treeless, herb-rich and grass-rich Pleistocene settings, not a complete map of Ireland. Wet ground, exposed limestone, river valleys, snow patches, ice margins and coastal terrain would have created local mosaics. Vegetation records elsewhere on the island, where they survive between or beneath glacial deposits, demonstrate that such archives can preserve freshwater and tundra plants, but their dates do not supply a countrywide annual weather report.

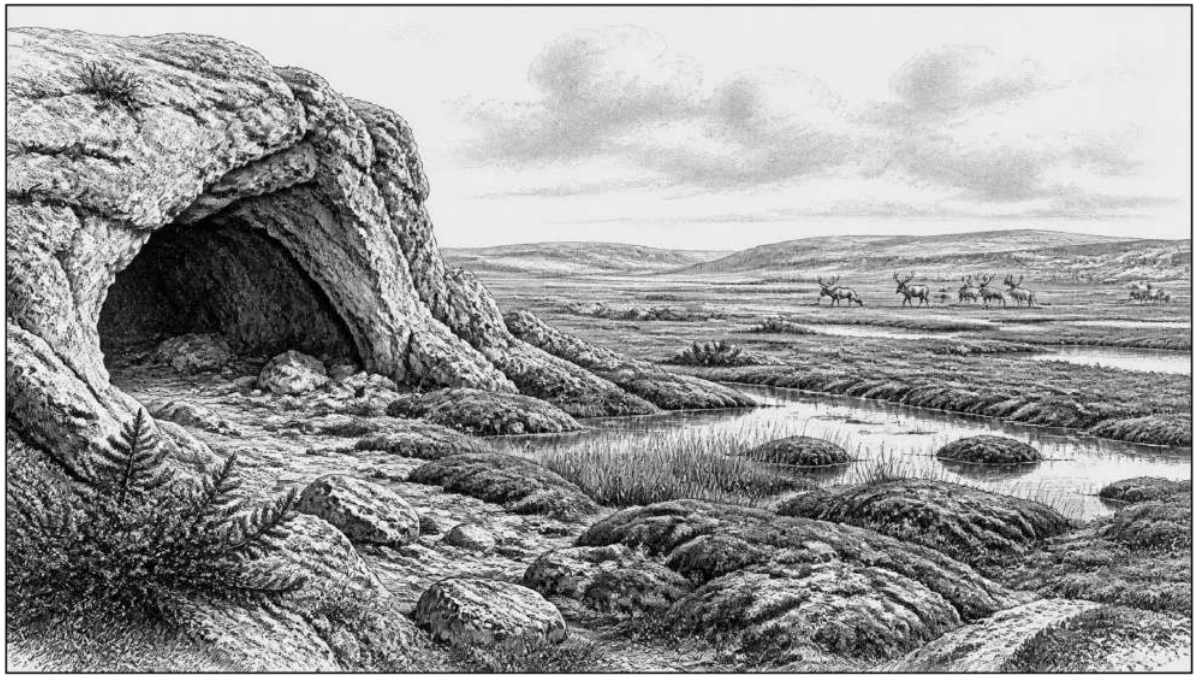
Later glacial erosion is a central reason for the silence. Ice advanced across much of Ireland after this period, stripping soils, deforming sediment and burying earlier surfaces beneath till. Caves, protected sediment pockets, offshore cores and raised beaches thus carry disproportionate weight. They are not merely supporting evidence for a lost written story; they are the story. Bones record animals, tool-like marks raise a question about people, sediments reveal water and ice, and dating methods establish ranges rather than anniversaries.

For 31,280 BCE, Ireland is best understood as a place at the edge of an unstable North Atlantic glacial system: environmentally severe but not necessarily uniformly ice-covered; occupied at least intermittently by large mammals; and perhaps visited by people whose trace is still no more than a contested bone. The great value of Castlepook is not that it supplies a confident narrative of the year. Its value is that it makes clear how much deep Irish history survives—and how carefully it must be read.

Chapter 022 of 100

31279 BCE

Castlepook’s Human Question [22]



A Date Without Annals

“31,279 BCE” is a useful modern label, not a date that can be matched to an Irish event. No calendar, written record, named people, political community or continuous archaeological sequence allows historians to isolate one year so deep in the Late Pleistocene. In archaeological terms, the label falls roughly 33,200 years before AD 1950, during Marine Isotope Stage 3, well before the fullest expansion of the last British–Irish Ice Sheet. At this depth of time, even radiocarbon results carry uncertainties, and converting them into calendar years requires calibration against changing atmospheric carbon. The responsible picture is therefore one of overlapping ranges, not a historical anniversary.

For Ireland, the nearest evidence comes from a small number of difficult deposits: cave faunas in the south and organic sediments sealed beneath later glacial deposits in the north. They illuminate climate, plants and animals far better than they illuminate human lives. The island was not the familiar green, wooded Ireland of later millennia. It was part of a changing north-west European ice-age world, alternately accessible or isolated according to sea level, ice margins and local geography. Any suggestion that people were present must remain carefully qualified.

An Island in a Cold Phase

The period belonged to the Midlandian glaciation, Ireland’s name for the last glacial cycle. It was not yet the Last Glacial Maximum, generally placed later, but ice sheets and glaciers were growing and the climate was severe by modern standards. Greenland ice-core records show that the wider North Atlantic

climate could alter abruptly between colder stadial and relatively milder interstadial conditions. Such shifts need not have been felt uniformly in Ireland, and they cannot be translated mechanically into a local weather report for 31,279 BCE. They do, however, explain why the Irish evidence records a restless rather than a static landscape.

At this stage, much of the modern coastline was profoundly different. Global sea level was lower than today because water was stored in northern ice sheets, exposing areas now beneath the surrounding seas. Yet low sea level alone does not prove that a simple, reliable land bridge joined Ireland to Britain or the Continent at this particular moment. Channels, ice, rivers, marshes and changing relative sea levels all mattered. Animals clearly reached Ireland during the Middle Midlandian, but the precise routes and seasons of movement remain matters for reconstruction rather than direct observation.

Nor should “ice age” be imagined as a uniform white wilderness. The evidence points to regional contrasts: exposed uplands, wind-scoured mineral ground, grass- and herb-rich patches, wet hollows and freshwater pools, with advancing ice affecting some areas much more directly than others. Sparse vegetation and cold conditions restricted tree growth. A treeless terrain could nevertheless sustain grazing animals, predators and scavengers, especially where summer productivity supported grasses, sedges and herbs. Ireland’s position on the Atlantic edge made its environments particularly sensitive to changing ice, moisture and temperature.

Derryvree’s Wetland Record

The clearest environmental window is at Derryvree near Maguiresbridge, County Fermanagh. There, organic silts and fine sediments lay between two bodies of glacial till in a road-cut through a drumlin. This stratigraphic position is important: it records an interval when freshwater sediment and vegetation accumulated before later ice or ice-derived material sealed the deposit. The conventional radiocarbon determination BIRM-166, obtained from the organic material, was 30,500 ± 1,100 radiocarbon years BP. One published comparison gives a calibrated estimate of about 35.9 ± 1.1 thousand calendar years BP. That range is older than the numbered year under discussion, but it provides indispensable evidence for the kind of cold-phase Irish environment from which this later point cannot be neatly separated.

Plant macrofossils, pollen and insects from Derryvree indicate open tundra or muskeg: a wet, mossy, largely treeless setting with shallow pools and saturated ground. Grasses and sedges were prominent, alongside herbs and low shrubs including juniper. Finds reported from the deposit include bogbean and mountain-avens, plants whose presence speaks to cold freshwater margins and open ground rather than forest. These remains are evidence for organisms living locally or close by; they are not a complete inventory of every plant on the island. Pollen can travel, be reworked and be unevenly preserved, while a single road-cut samples only one landscape pocket.

Still, the combined evidence is powerful. Derryvree shows that Irish ground between glacial episodes could support a mosaic of wetland and tundra vegetation. It also corrects any assumption that the island was continuously buried beneath ice throughout the entire last glacial cycle. Its cold freshwater world was biologically active: mosses held wet ground together, aquatic plants occupied pools, and insects responded to seasonal warmth as well as hard winters. Such places were not merely empty spaces between ice advances; they were habitats, though harsh and likely fragile ones.

Castlepook and the Faunal Frontier

In north County Cork, Castlepook Cave near Doneraile offers a different archive. The limestone cave system, long known as Mammoth Cave, yielded more than 2,000 animal bones during excavations between 1904 and 1918. Its galleries acquired vivid names such as Hyenahall and Elephant Hall, reflecting the extraordinary finds recovered from them. Radiocarbon determinations on individual bones span a long interval, approximately 45,700 to 19,950 years BP. The cave was therefore a repository assembled over many millennia, not a single sealed moment or a straightforward snapshot of one herd, one hunt or one season.

Its fauna nevertheless establishes that Ireland supported, or was visited by, an impressive Pleistocene animal community before the Last Glacial Maximum. Woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena are represented, while Arctic fox, wolf, mountain hare and lemmings appear in the wider cave record. These species did not necessarily coexist in precisely the combinations suggested by a museum display: revised dating has shown that several older determinations from Irish caves were substantially too young because of limitations in earlier bone pretreatment. The strongest conclusion is that mammals moved through Ireland at different points during Marine Isotope Stage 3, responding to shifting habitats and connections across the north-west European region.

Predators and scavengers were central to how this archive formed. Spotted hyaenas almost certainly used Castlepook as a den or feeding place, carrying in bones and modifying them. Water movement, collapse, later disturbance and early excavation methods further complicate the deposits. These processes matter because they prevent a simple equation between a bone’s findspot and the place where an animal died. Castlepook is exceptionally valuable, but its very richness demands caution: it preserves a long story of carnivore behaviour, animal mortality and sediment movement.

The Marked Reindeer Femur

The most consequential object associated broadly with this period is a reindeer femur from Castlepook. County Cork’s heritage publication assigns it to about 31,000 BC and records a deep linear mark interpreted by the palaeozoologist Ruth Carden as having been made by a sharp stone tool during carcass processing. If that interpretation is confirmed, it would be a remarkable indication that a person handled reindeer in Ireland far earlier than the island’s previously accepted terminal-Pleistocene human evidence. It would make the bone an important, but still very limited, trace of possible Upper Palaeolithic activity.

What it does not establish is equally important. The femur is not a house floor, hearth, burial, tool assemblage or repeatedly occupied camp. No stone tool securely associated with the bone has been recovered, nor is there evidence for a permanent population, a named group or continuous settlement at Castlepook. A radiocarbon result dates the animal’s death within a probability range; it does not date a surface incision to an exact year. Whether the mark is a human cut, and whether it reflects a brief visit, hunting, scavenging or another episode of processing, are questions that require microscopic study and secure contextual evidence.

Society Beyond Recovery

Consequently, political affairs, diplomacy, organised warfare, religion, language, learning and trade cannot responsibly be described for Ireland in 31,279 BCE. There are no Irish monuments, art objects, burials, settlements or ritual deposits of secure date from which to infer them. Nor can the social arrangements of Upper Palaeolithic communities elsewhere in Europe simply be transplanted to Cork or Fermanagh. If people did reach Ireland, they may have travelled in very small, mobile groups whose material traces were vulnerable to later glaciation, erosion and rising seas. That is a possibility, not a demonstrated population history.

Economy, in the narrow sense available here, belongs chiefly to wild ecology. Reindeer would have offered meat, hide, sinew, bone and antler to hunters capable of exploiting them, while large herbivores and carnivores reveal an open food web. But the Irish evidence does not yet show which resources people used, where they camped, whether they crossed water, or whether any exchange linked them to communities in Britain or continental Europe. The cave fauna demonstrates opportunity and habitat; the marked femur, if accepted, may demonstrate one human act. The distance between those propositions is substantial.

What This Moment Means

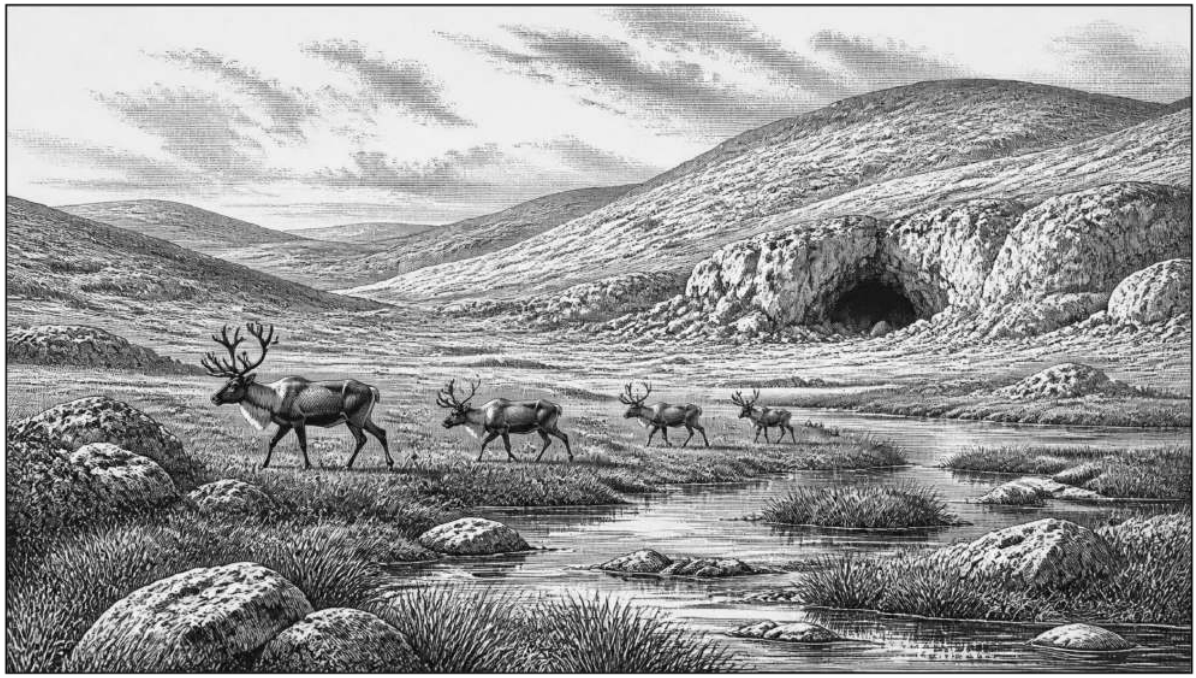
Around the modern label 31,279 BCE, Ireland’s history is best approached through its surviving natural archives. Derryvree records cold wetland life during a pre-maximum glacial interval; Castlepook records a long-lived faunal frontier in which mammoths, reindeer and hyaenas left bones in a limestone maze. Together they show an Ireland that was neither timelessly frozen nor securely settled: an exposed, changing country capable of sustaining specialised animals and perhaps visited by people at the outer edge of Upper Palaeolithic Europe.

The outstanding task is not to convert a suggestive bone mark into an unwarranted origin story. It is to preserve caves and sediment sequences, re-examine old collections with modern dating and taphonomic methods, and seek undisturbed deposits. New work at Castlepook has demonstrated that the cave still has research potential. For now, the most accurate year-by-year conclusion is restrained but compelling: this was a period of ecological possibility, severe climatic change and a tantalising question about the earliest human presence in Ireland.

Chapter 023 of 100

31278 BCE

Cork’s Reindeer Window [23]



31,278 BCE is a modern chronological label, not a year that can be matched to a recorded Irish event. There were no written calendars, named rulers or dated settlements in Ireland at this depth of time. Even the conversion is only a convenience: in the conventional system that counts calibrated ages back from 1950, this label falls roughly 33,227 years before present. Archaeology cannot distinguish what happened in one particular year. The responsible frame is therefore the later part of the Late Pleistocene, within Marine Isotope Stage 3, and the evidence must be expressed through date ranges, deposits and probabilities rather than a year-by-year narrative.

A Cold, Changing Island

Ireland around this notional date stood in a long glacial age, but not necessarily under a single, unchanging blanket of ice. Marine Isotope Stage 3, conventionally spanning about 57,000 to 29,000 calibrated years before present, was climatically unstable. Cold phases alternated with comparatively milder interludes on scales far longer than a human lifetime but short in geological terms. The large British–Irish Ice Sheet was growing and changing its limits. Its later maximum, broadly around 25,000–23,000 years ago in the Irish Sea sector, still lay in the future; yet evidence from western Ireland also indicates major earlier ice advances and substantial local ice loading before that maximum.

That complexity matters. It is unsafe to picture all of Ireland at c. 33,200 calibrated years ago as either wholly ice-covered or wholly open country. Ice margins differed between regions and advanced or retreated over time. Much of the evidence comes from deposits that have themselves been overridden, eroded, redeposited or exposed only in modern quarrying, roadworks and caves. The most defensible

conclusion is a regional one: at some points during this wider interval, ice-free or less severely glaciated landscapes existed sufficiently long for plants, animals and freshwater environments to develop, while other areas were affected by ice or lay close to its margins.

Derryvree’s Buried Wetland

A crucial environmental archive lies at Derryvree near Maguiresbridge in County Fermanagh. Road excavation in 1969 cut through a drumlin and revealed freshwater silts and fine sands between two thick tills. The organic deposit is not a diary of a particular Irish year, nor should it be assumed to represent conditions across the island. Its significance is that it records a cold, largely treeless wetland environment during an earlier Midlandian interstadial sequence, securely demonstrating that freshwater plants, insects and open-ground communities could occupy parts of Ireland between episodes of glaciation.

The Derryvree evidence suggests sedge-rich, mossy and shallow-water habitats rather than a familiar modern landscape of enclosed fields and woodland. Fossil plant remains include species suited to cold, open conditions, while insect evidence adds detail about local habitats. Pools, damp ground and vegetation along their margins could sustain a small but functioning food web. This was not a lush temperate refuge. It was a demanding northern environment, exposed to severe winters, short growing seasons and changing moisture conditions. Nevertheless, it contained biological productivity: a fact of importance when considering where grazing animals might have found forage.

Chronological correlation remains cautious. The Derryvree organic layer has been discussed in relation to cold phases around the middle of the last glacial cycle, and its radiocarbon evidence requires calibration and comparison with other records. It provides a close palaeoenvironmental analogue for the kind of Irish landscape relevant to 31,278 BCE, not proof that every Derryvree pond was open in that numbered year. Its principal lesson is methodological as well as environmental: Irish deep-time history survives in fragments, and each fragment has a local setting and its own chronological uncertainty.

Castlepook’s Animal Archive

The most important evidence from southern Ireland is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, in the Awbeg valley below the Ballyhoura Hills. Excavated principally in the early twentieth century, the cave yielded a remarkably rich collection of Pleistocene animal remains. Later research and direct radiocarbon dating have made it central to discussion of Ireland before the Last Glacial Maximum. The cave contains bones from more than one period, however, and its deposits were disturbed by water, earlier excavation and natural processes. It is an archive assembled over time, not a sealed hunting camp.

Its fauna is striking. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyena are represented in the wider Castlepook record. The association does not mean that every species shared the same valley in the same season. Direct dates on individual bones span a substantial interval, and older excavation methods did not preserve the contextual detail now expected. Still, the assemblage firmly establishes that Ireland was reached by a succession of cold-stage mammals during Marine Isotope Stage 3. The cave was connected, directly or indirectly, to a wider north-west European world of open habitats and mobile animal populations.

Reindeer are especially relevant to the approximate period represented by 31,278 BCE. They are well adapted to open, cold landscapes and could have exploited herbs, grasses, sedges, dwarf shrubs and lichens across broad seasonal ranges. Their presence does not prove an uninterrupted herd moving

through every part of Ireland, but it makes a reindeer landscape credible in suitable regions. Mammoth and giant deer point to varied grazing opportunities, while carnivores such as hyena and wolf indicate that carcasses, prey and shelter were contested resources. Caves may have served as dens, traps, temporary refuges or places where bones were washed in; each mechanism has different implications for what survives.

The Human Question

A reindeer femur from Castlepook has been reported as bearing a mark interpreted as a fresh-bone cut made with a sharp stone tool, and it has been widely presented as evidence for human activity in Ireland about 33,000 years ago. If that interpretation is upheld, it would indicate a brief Upper Palaeolithic human incursion, probably involving carcass processing, during the broader period close to this article’s notional date. It would not establish a village, a permanent population or a known community. No securely associated hearth, stone-tool assemblage, dwelling floor, human bone or undisturbed butchery area of comparable age has yet been recovered at the cave.

That distinction is essential. A single modified bone can illuminate an encounter between people and an animal, but it cannot reveal the size, language, kinship system or duration of a group. Nor can a cave fauna be transformed automatically into a story of regular reindeer hunting. The possibility of human visitation is important precisely because Ireland’s earlier Palaeolithic archaeological record is so slight. It should be described as evidence under investigation and interpretation, not as a settled fact from which a detailed social history can be built. Recent excavation at Castlepook located surviving deposits and recovered faunal material, but reported no cultural artefacts.

If people did reach Ireland in this period, they would have belonged to the wider Upper Palaeolithic human world of north-west Europe. Comparisons with Britain and continental Europe make small, mobile hunter-gatherer parties a reasonable model, especially where seasonal animal movements offered opportunities. Yet comparison is not evidence of identity. No Irish site of this age has produced the blades, points, ornaments, portable art, shelters or burials that could tie visitors to a particular archaeological culture. The distance across changing sea, shelf and ice conditions is also unresolved at the needed scale. Lower global sea levels exposed land now submerged, but that alone does not demonstrate a dry, accessible route from Britain to Ireland at this moment.

No Polities, No Diplomacy

There is no evidence for political institutions, territories, chiefs, warfare, diplomacy or collective identities in Ireland around 31,278 BCE. Those are not subjects hidden by a lack of written sources; the material record is far too sparse to support them. Nor can religion be responsibly reconstructed. Ireland has no demonstrable shrine, burial rite, cave art, ceremonial object or structured deposit from this date. It is possible that any visiting people possessed social rules, stories, ritual practices and learned ecological knowledge, as all human groups do, but none can presently be identified as Irish evidence.

The same restraint applies to culture and economy. There was no agriculture, livestock keeping, metalworking, pottery production or built settlement in evidence. If humans were present, their subsistence may have included opportunistic hunting, scavenging or butchery of large mammals, supplemented in ways invisible to the record by smaller game and gathered foods. Such possibilities are

interpretations based on the ecological setting and Upper Palaeolithic comparison, not observations from an excavated Irish camp. There is no direct evidence for trade, regular exchange routes or seafaring at this date.

A Landscape Before Erasure

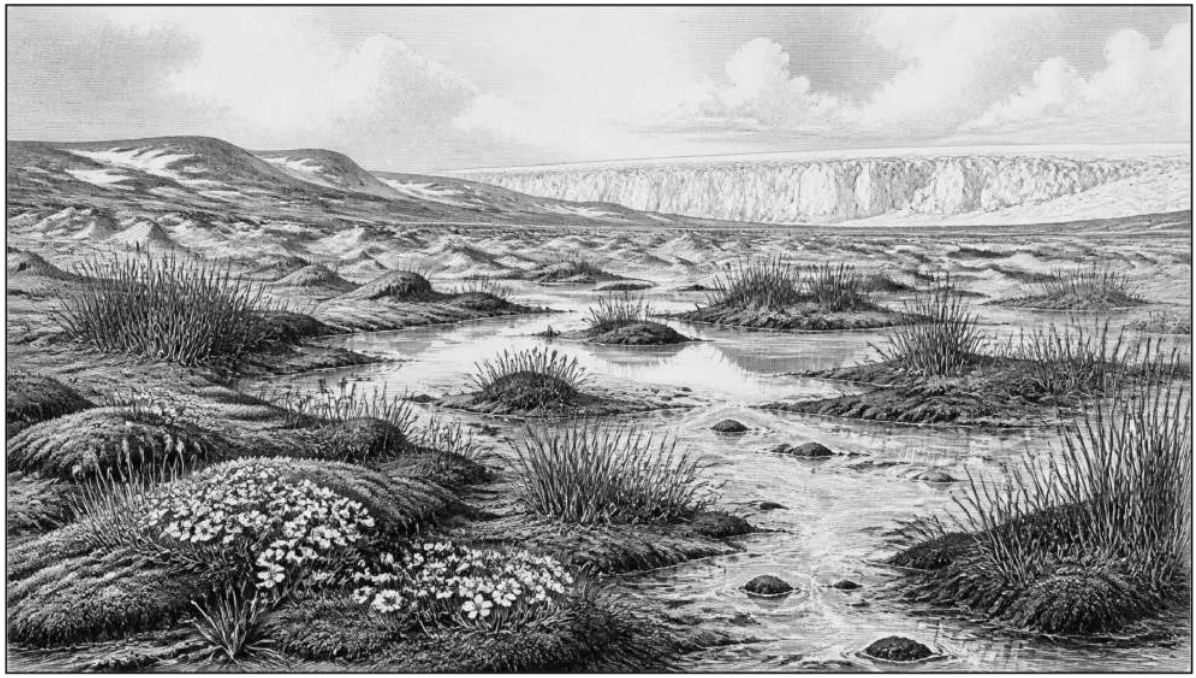
The greatest historical development appropriate to this point is not a named human event but the formation of a fragile environmental and fossil record before the harshest stages of the last glaciation reshaped much of the island. Ice could scour landscapes, rework sediments and destroy or bury open-air sites. Sea-level change later drowned parts of the former coastal plain. Those processes help explain why caves such as Castlepook and sediment pockets such as Derryvree have disproportionate importance: they are rare survivors from a period for which Ireland has no continuous archaeological sequence.

Thus Ireland at 31,278 BCE can be approached, but not narrated with false precision. The evidence supports a cold and variable late-Ice-Age setting, locally capable of sustaining wetland vegetation and cold-adapted mammals. Castlepook offers compelling evidence of a rich fauna and a debated indication that people may have briefly processed reindeer there. It does not support claims of an established Irish population, a named culture or an event assigned to one calendar year. The honest history of this moment is an unfinished one: written in bone, silt, pollen, insects, cave sediments and the careful revision of older collections.

Chapter 024 of 100

31277 BCE

Derryvree’s Silted Pond [24]



“31,277 BCE” is a modern chronological label, not a date that can be recovered from Irish evidence with calendar-year precision. No community in Ireland kept a written calendar at this depth of time, and neither archaeology nor earth science can identify an event, ruler, battle, settlement or individual belonging to that particular year. In the conventional archaeological count from AD 1950, the label lies roughly 33,226 years before present. That arithmetic conversion must not be mistaken for a scientific date: radiocarbon determinations require calibration, carry statistical uncertainty, and usually illuminate spans of centuries or longer. The responsible subject is therefore Ireland in the later part of Marine Isotope Stage 3, during the long climatic descent towards the Last Glacial Maximum.

For this period Ireland has no historical narrative. Its record consists instead of cave bones, organic silts, pollen, plant remains, beetles, landforms and measurements of radioactive decay or cosmogenic exposure. These traces establish some things securely: climates were severe and unstable; ice masses were growing and shifting around Ireland and the Irish Sea; and cold-adapted animals could occupy at least parts of the region during ice-free intervals. They establish other things poorly or not at all: human population, language, social organisation, religious practice, territorial control and trade. A year-by-year account must begin by recognising that the most important evidence is environmental, not political.

A Cold Stage in Motion

The Irish name for the last major glacial episode is the Midlandian glaciation. Around the requested date, the British–Irish Ice Sheet was not yet necessarily at its single, universally simultaneous maximum. Modern reconstructions instead show a complicated and asynchronous growth of ice between roughly 35,000–32,000 and 27,000–21,000 years ago, with different sectors advancing, stabilising or retreating at

different times. In the Irish Sea sector, substantial expansion is placed broadly between about 30,000 and 26,000 years ago. The global Last Glacial Maximum came later, conventionally about 26,500–19,000 years ago.

This means that it would be misleading to picture one uniform Irish landscape in 31,277 BCE. In some places ice may already have overridden the ground; elsewhere, exposed terrain, marine margins, lakes or wetlands could survive temporarily. Ice-sheet reconstructions are continually refined because their evidence is uneven. Moraines, streamlined drumlins, meltwater channels, offshore sediment cores and dated shells preserve different parts of the story, often recording the passage of ice rather than the precise time of its arrival. The later ice sheet also scoured away or buried much of what had existed before it. Ireland’s apparent archaeological silence is therefore partly a product of preservation.

The Fermanagh Freshwater Archive

The closest and most informative Irish environmental evidence comes from Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 exposed fine sands and freshwater organic silts sealed between two thick tills within a drumlin. The deposit was investigated by Eric Colhoun, James Dickson, A. M. McCabe and F. W. Shotton, who recovered pollen, seeds, mosses and insect remains. A conventional radiocarbon determination of about 30,500 ± 1,100 radiocarbon years before present is not equivalent to a single modern calendar date; later calibration discussions place it broadly in the mid- to later-MIS 3 world, with a range extending over millennia. It is near enough to the requested horizon to be illuminating, but it is not proof of conditions in Ireland in one numbered year.

What the Derryvree silts do show is a local freshwater environment in an otherwise cold, open landscape before a later ice advance sealed it beneath till. The recovered flora includes sedges, mosses and aquatic plants such as bogbean; records also include cold-tolerant plants including mountain avens and rosy saxifrage. Beetle evidence complements the botanical material. Together, these proxies support an interpretation of shallow water, wet margins and tundra-like or periglacial ground, rather than forested countryside. Trees were not the defining feature of this northern landscape. Summers may have permitted a brief growing season at favourable wetland edges, while winters were long and severe.

This is a valuable corrective to a familiar image of an Ireland wholly entombed beneath ice. Ice certainly dominated the broader glacial history, and later ice helped create the drumlin landscape now associated with Fermanagh. But the inter-till deposit shows that open water and living communities of plants and invertebrates could exist during a cold interval between episodes of glaciation. It does not allow us to reconstruct a pleasant oasis or a stable ecosystem. Its value lies precisely in revealing an austere, changeable habitat at the edge of expanding ice.

Animals in Open Country

Caves in southern Ireland provide another fragmentary line of evidence. The old collections from Castlepook Cave near Doneraile, County Cork, include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Some radiocarbon determinations on the assemblage fall in the broad pre-Last-Glacial-Maximum period, though the cave’s deposits accumulated over long spans and were excavated before modern recording standards. Bones found in the same cave need not be contemporary, and animal lists should not be turned into a precise inventory for every Irish valley.

Even with that caution, the fauna is significant. Reindeer, lemmings and Arctic fox indicate cold open habitats; mammoth and giant deer suggest that large herbivores at times reached Irish landscapes capable of sustaining them. Spotted hyaena and wolf point to predator-scavenger networks, while the cave itself may have been used repeatedly by carnivores bringing in prey or by animals dying in its passages. Their presence demonstrates regional ecological connections across a north-west European world whose coastlines and ice margins differed greatly from those of today. It does not demonstrate that these species all lived together at one moment, nor that their range extended continuously across every part of Ireland.

The Human Question

Human activity is the most tempting and the most uncertain subject. A reindeer femur from Castlepook has been reported as carrying a deep linear mark consistent with stone-tool butchery and as dating to approximately 33,000 years ago. If the modification is confirmed as human-made, it would be extraordinarily early evidence that one or more Upper Palaeolithic people processed an animal in Ireland before the great ice advance. It would indicate a visit or a short-lived use of the island, not a settled population, a named people or a durable colony.

The qualification is essential. The specimen derives from an old cave collection rather than a newly excavated occupation floor with associated tools, hearths, dwelling traces and a securely dated series of butchered remains. A radiocarbon measurement dates the animal’s death, not automatically the cut or its maker. Sharp marks may be evaluated against damage caused by carnivores, trampling, sediment movement, breakage, weathering and earlier excavation. Ireland has no securely associated stone-tool assemblage, human bone, camp or burial of comparable antiquity. The National Museum of Ireland consequently still describes clear Palaeolithic human presence on the island as unproven, while the better-supported terminal Pleistocene evidence is far later: a butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to about 12,810–12,590 calibrated years BP.

It is reasonable to say that mobile hunter-gatherers elsewhere in Upper Palaeolithic Europe possessed sophisticated stone technologies, used fire, made clothing and equipment from organic materials, shared food, and maintained social ties over wide areas. It is not reasonable to assign those practices directly to Ireland in 31,277 BCE. The possibility of a brief human encounter with a reindeer belongs to the evidence; an Irish campfire, kin group, language, ritual or hunting territory belongs to inference beyond what the island’s record presently bears.

No Politics, No Trade, No Named Communities

Accordingly, there are no identifiable political affairs, conflicts, diplomatic exchanges, institutions or leaders for Ireland at this time. Nor is there evidence for agriculture, herding, permanent settlement, craft production, formal religious monuments, graves, seaborne commerce or long-distance trade from this horizon. Lower global sea levels exposed portions of the surrounding seabed, but the exact geography of routes between Ireland and Britain remains model-dependent and changed with ice loading, crustal movement and the sea. Physical access alone would not prove human movement.

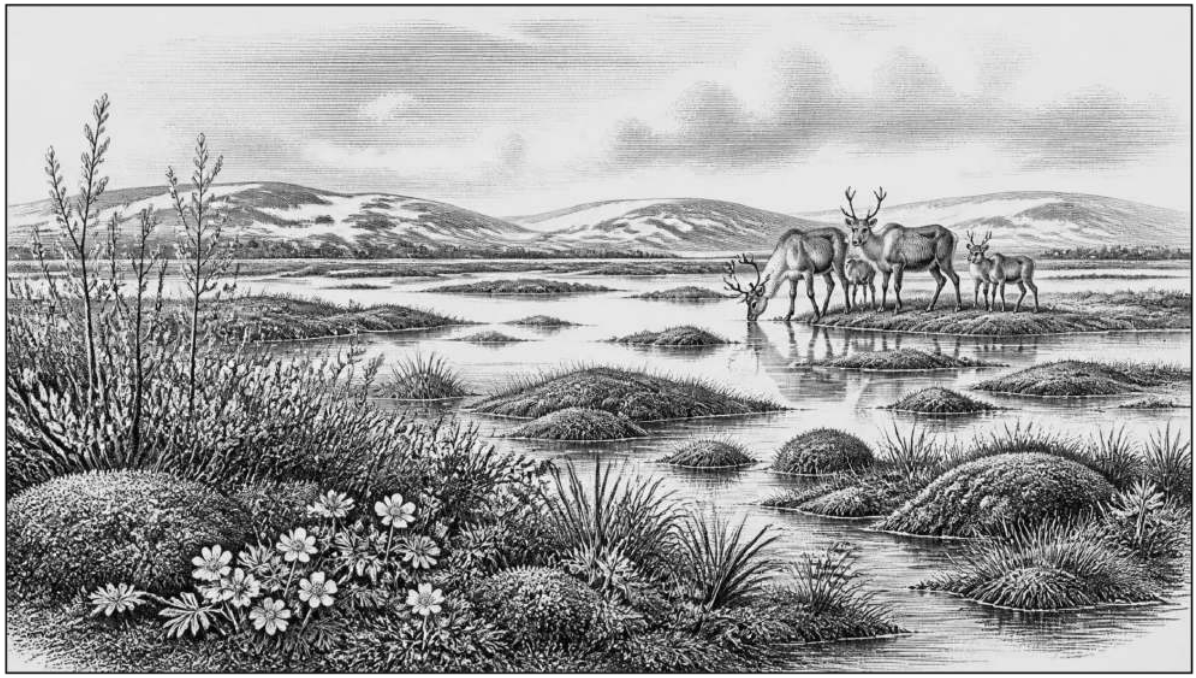
The major development around 31,277 BCE was therefore environmental: Ireland was entering a harsher phase in which advancing ice and polar-desert or tundra conditions increasingly constrained life. Derryvree’s buried freshwater bed preserves a fleeting counterpoint—plants, insects and water persisting in a cold landscape before later ice covered the site. The cave fauna shows that animals occasionally

found a way into this changing world. Whether people did so too remains an important question, not a settled fact. For Ireland, this is not yet history in the conventional sense. It is deep time, reconstructed patiently from the small survivals that ice did not erase.

Chapter 025 of 100

31276 BCE

BIRM-166’s Dwarf Willow [25]



The label 31,276 BCE gives a useful point of reference, but it cannot describe a known Irish event in a single calendar year. No written record, settlement sequence or precisely dated human action exists for that year. In archaeological terms it falls about 33,226 calendar years before AD 1950, within the later part of Marine Isotope Stage 3, a long and unstable phase of the last ice age. The responsible history is therefore regional and approximate: a reconstruction from sediments, fossils, cave deposits and ice-sheet evidence, expressed in calibrated ranges rather than annual certainty.

The closest major Irish environmental archive is the Derryvree freshwater series, exposed during roadworks in 1969 near Maguiresbridge, County Fermanagh. There, organic silts and fine sands lay between two tills: the unsorted debris deposited by successive glaciers. This order matters. It proves that, at least locally, an ice-free freshwater environment existed after one phase of glaciation and before another. A conventional radiocarbon measurement, BIRM-166, produced an age of 30,500 years BP with a large error margin. Modern calibration has been discussed as a broad span of roughly 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The notional year lies within that range, but cannot be pinned to a particular season, layer or moment in the life of the wetland.

A Wetland Between Ice Advances

Derryvree offers an unusually vivid, if local, view of Ireland at this time. Its plant remains, pollen and insects indicate a cold, open, treeless landscape with standing or slow-moving fresh water, mossy margins and patches of wet ground: what researchers described as a muskeg or tundra wetland. Sedges and grasses were important parts of the vegetation. Fossils include species associated with Arctic or alpine conditions, among them dwarf willow, mountain avens and bogbean, while water-milfoil points to freshwater pools.

Insects of cold northern aspect reinforce the botanical evidence. This was not an empty, uniform plain of snow; it was a seasonally changing mosaic of shallow water, saturated ground, low plants and exposed mineral soil.

That reconstruction needs careful limits. The Derryvree deposits record their immediate catchment, not the whole island. Pollen can travel, sediments can be redeposited, and a drumlin cutting is a rare survivor of a landscape repeatedly reshaped by ice. Nevertheless, its position between tills establishes an important negative point against an older simplified picture: Ireland was not continuously buried beneath a single unbroken ice cover throughout the last glacial period. At the same time, Derryvree does not demonstrate that every region was ice-free, nor that a stable climate endured for centuries without interruption.

Other northern sites help to frame this uncertainty. Organic deposits at Hollymount, also near Maguiresbridge, and at Greenagho near Belcoo show that cold, open, non-forested conditions occurred in Fermanagh during portions of the Midlandian, the Irish name for this part of the last glacial cycle. Their dates and correlations are not equally secure. Greenagho’s radiocarbon result, for example, has been treated cautiously as a minimum age. Such evidence is more useful for identifying recurring environmental states than for drawing a single island-wide map for 31,276 BCE.

Before the Greatest Expansion

The date belongs before the global Last Glacial Maximum, generally placed around 26,500–19,000 years ago, and before the maximum extent of the last British–Irish Ice Sheet. That does not mean conditions were mild. Ice sheets expand, thin and reorganise asynchronously; local glaciers, sea ice, permafrost and severe winters could shape life far beyond an ice margin. Recent reconstructions of the British–Irish Ice Sheet begin at about 31,000 years BP and show substantial growth and changing flow patterns in the millennia that followed. Around the nominal date, Ireland was entering a world in which cold conditions and advancing ice would increasingly determine the survival of landscapes and their inhabitants.

The physical geography was also unlike that of the modern republic and Northern Ireland. Global sea level was much lower because immense volumes of water were held in ice sheets, but coastlines around Ireland cannot be reconstructed from sea level alone. Isostatic movements of the land, glacier margins and later marine erosion complicate the picture; much of the relevant coastal plain is now underwater or has been reworked. It is therefore unsafe to claim a simple, permanent land bridge from Ireland to Britain or continental Europe. Movement of animals and any people must be considered possible only through changing, poorly resolved routes, rather than assumed from a map of lowered seas.

Animals in the Open Country

Southern Ireland provides a complementary but differently problematic record. Castlepook Cave, near Doneraile in north County Cork, has long been known as Mammoth Cave because of its rich Pleistocene fauna. Its deposits and old excavations produced remains attributed to woolly mammoth, reindeer, giant deer, wolf, fox or Arctic fox, brown bear, spotted hyaena, mountain hare and lemmings. Together these species support the broad inference of open, cold habitats capable of sustaining grazing animals and their predators. Mammoth, reindeer and giant deer should not, however, be imagined as a single herd encountered on one day. Cave assemblages can accumulate through carnivore activity, natural deaths, water transport and human collecting over long periods.

Dating has made that warning especially important. Earlier radiocarbon programmes placed elements of the Castlepook fauna in the middle of the last glaciation, broadly comparable in age to the Derryvree evidence. Later work on improved pretreatment of bone samples demonstrated that some older Irish cave determinations could be misleading. Castlepook is thus a crucial archive, but not a securely stratified census of the island at 31,276 BCE. What it can support is a cautious image of animal communities reaching Ireland during Marine Isotope Stage 3, when the island's ecology included species now absent from it.

For animals, the practical economy was seasonal movement through an exposed landscape. Reindeer could exploit lichens, grasses and sedges; hares and lemmings occupied low vegetation and sheltered ground; large herbivores would have concentrated opportunities for wolves and hyaenas. This is ecological interpretation, not direct observation. There are no Irish kill sites, camps, storage pits or trackways dating securely to this point that reveal how prey and predators used a particular valley. Yet the mixture of wetland flora at Derryvree and large-mammal fossils at Castlepook makes clear that the island had resources as well as hazards.

The Human Question

Whether people were present in Ireland around this period remains the most arresting and the most constrained question. A reindeer femur from Castlepook has been publicised as bearing a deep mark consistent with cutting on fresh bone by a stone tool, and has been associated with an age of about 33,000 years. If the mark is confirmed as anthropogenic and contemporary with the animal's death, it would indicate a brief Upper Palaeolithic human encounter with a reindeer carcass, perhaps by a very small travelling group. It would not by itself prove a permanent population, a village, or a continuing Irish hunting tradition.

The distinction is essential. Castlepook has not supplied a securely associated hearth, stone-tool assemblage, house floor, human bone, burial or dense cluster of deliberately butchered remains from this early period. Antiquarian excavation and the complex history of cave deposits make association difficult. Elsewhere in north-west Europe, Upper Palaeolithic communities made sophisticated stone and organic tools, developed artistic traditions and hunted large game. Those continental and British comparisons show what was possible, but they are not evidence that such practices were established in Ireland. Ireland's own record remains too thin to assign a language, ethnicity, social structure or named culture to the inhabitants of this notional year.

What Cannot Be Recovered

Accordingly, there were no demonstrable Irish political affairs, diplomacy or organised warfare to record in 31,276 BCE. No chiefdom, territory, treaty, fortification or conflict has been identified. Nor is there evidence for local religion, formal burial, art, schooling, farming, herding, metalworking, pottery, long-distance trade or seafaring at this date. These are not merely missing details awaiting a name: the surviving evidence is of a kind that cannot sustain such claims. A possible act of butchery, if upheld, concerns subsistence at a single point, not a documented society.

The most meaningful development is environmental. In the Fermanagh evidence, freshwater life and tundra plants occupied ground later sealed beneath glacial sediment. In the Cork caves, mammals preserve evidence of an Irish fauna that later climatic deterioration would transform. The interval was one of

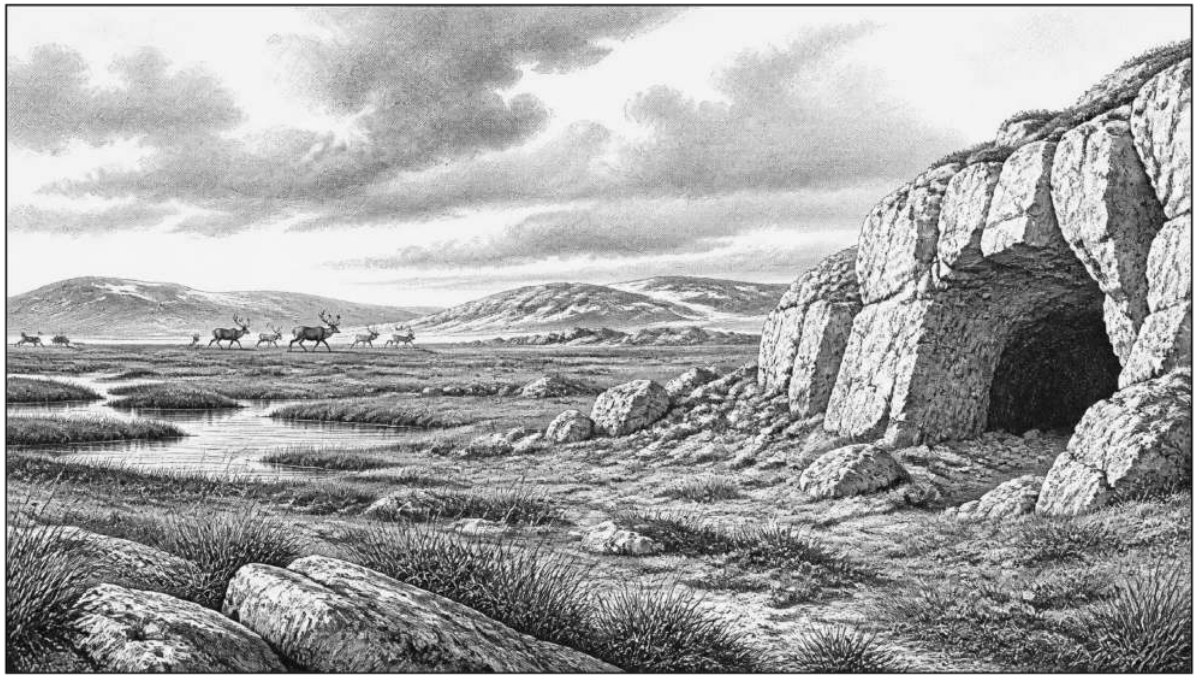
repeated thresholds: between ice advances, between wetland and frozen ground, and perhaps between animal-only landscapes and occasional human visits. Its history survives not in chronicles but in a dwarf willow fragment, a bogbean seed, insect remains, cave bone and the sedimentary boundary left by ice.

For that reason, 31,276 BCE should be approached as an archaeological horizon rather than a date of certainty. The calibrated ranges permit Derryvree and aspects of the Castlepook fauna to illuminate the broad period, while demanding restraint about exact simultaneity. Ireland at this point was cold, open and environmentally dynamic; parts of it were capable of supporting freshwater ecosystems and large mammals; and human presence is a serious but still limited possibility rather than a settled fact. That modest conclusion is also a substantial one: it replaces a blank, frozen island with a difficult, changing Pleistocene landscape whose few surviving records deserve to be read closely.

Chapter 026 of 100

31275 BCE

Castlepook’s Reindeer Margin [26]



The modern label 31,275 BCE is useful for placing this article in a long sequence, but it must not be mistaken for a date that archaeology can resolve in Ireland. No calendar, written record or year-specific event survives from this depth of time. In archaeological terms, the point is approximately 33,224 calibrated years before present (cal BP, where “present” is conventionally 1950), within the Late Pleistocene and Marine Isotope Stage 3. Radiocarbon results are reported as probability ranges, not as single historical days or years; deposits can also mix material accumulated at different times. What can responsibly be described is therefore Ireland’s changing Ice Age setting around the early thirties of thousands of years ago, and the unusually important but fragile evidence from a limestone cave near Doneraile in north County Cork.

A Date Before the Ice Maximum

This was not yet the Last Glacial Maximum, the interval of greatest global ice volume generally placed between about 26,500 and 19,000 years ago. Yet it was plainly a glacial world. Across the wider British–Irish region, ice sheets were advancing and retreating asynchronously, responding to shifts in temperature, snowfall, sea level and the behaviour of fast-flowing ice streams. Reconstructions of the British–Irish Ice Sheet now show that different sectors reached their maxima at different times, broadly between 30,000 and 22,000 years ago. That result is an important warning against imagining a single, uniform Irish ice front on a particular modern-calendar year.

For about 33,000 cal BP, the exact distribution of ice in Ireland remains less secure than its later maximum extent. Geological evidence demonstrates that the island was profoundly reshaped by repeated glaciations, but it does not permit a confidently drawn map for 31,275 BCE. Southern Ireland, including the limestone country of north Cork, may have contained exposed ground during part of this earlier

interval, even as ice expanded elsewhere or lay nearby. Later ice advance, erosion, frost action and meltwater removed or buried much evidence that might once have recorded the landscape more clearly. The absence of a site is consequently not proof that no animal or person ever entered an area.

Land, Sea and Open Country

Ireland was not then the sea-bounded island familiar today. Global sea level stood far lower than at present because vast quantities of water were locked in continental ice. The Irish Sea basin and surrounding shelves were correspondingly altered, and Ireland belonged to a wider north-west European land-and-coastscape whose routes changed with sea level and ice. This does not mean that every journey was easy, or that a continuous dry passage existed at every moment. Rivers, marshes, proglacial lakes, ice margins and unstable coastlines could make travel hazardous. But the geographical separation that later constrained Ireland’s fauna and human settlement had not yet assumed its modern form.

The most defensible environmental picture is of a cold, largely treeless mosaic rather than an unbroken white desert. Wind-exposed grassland, herb-rich steppe-tundra, patches of dwarf shrub, bare mineral ground, seasonal pools and sheltered valleys could each have existed in differing proportions. Plant macrofossils, pollen, insects, animal bones and sediments are the means by which such landscapes are reconstructed; none supplies a photograph of one particular year. Conditions also varied sharply over centuries and millennia. A short warm pulse might encourage vegetation and grazing animals, while renewed cooling could reduce food, deepen permafrost and alter the accessibility of whole regions.

The Castlepook Faunal Archive

Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, is central to any account of this period. Early twentieth-century excavators recovered a remarkable collection from its passages: remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, red fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Re-dating has transformed understanding of this material. Improved pretreatment of bone collagen showed that several results obtained in the 1990s were too young, with Castlepook specimens yielding dates thousands of radiocarbon years older on re-analysis. The assemblage belongs substantially to Marine Isotope Stage 3, rather than forming a simple late-glacial animal list.

These animals are evidence for the presence of species in Ireland over broad spans of time, not proof that all stood together in one herd or shared one season. Cave deposits are especially difficult archives. A hyaena may have dragged in bones; carnivores may have chewed or scattered them; water, sediment movement, later animals and human excavation can redistribute them. Castlepook’s original excavation between 1904 and 1913 was invaluable in rescuing bones but took place before modern recovery, recording and dating standards. Recent work has sought surviving deposits and has confirmed their research potential, but a 2022 excavation did not identify cultural artefacts and found that many sediments had been disturbed or were recent. The cave is a major palaeontological archive, not a securely excavated Palaeolithic campsite.

Reindeer and a Possible Human Trace

A reindeer femur from Castlepook gives this otherwise remote date special historical interest. County Cork heritage interpretation has described a deep mark on the bone as consistent with processing by a sharp stone implement, and has associated the specimen with an age of roughly 33,000 years ago. If that interpretation is sustained by further microscopic and contextual work, it may record a brief human encounter with a reindeer carcass during the Middle Upper Palaeolithic. It would be immensely significant: a hint that people reached what is now Ireland long before the better-known post-glacial settlement of the island.

That possibility must be kept distinct from what the evidence proves. A radiocarbon measurement dates the animal's death within a range; it does not, by itself, date the making of a surface mark or establish who made it. Nor has Castlepook produced a securely associated hearth, stone-tool assemblage, dwelling floor, burial, repeated butchery area or occupation layer of comparable age. One modified bone cannot tell us how many people may have been present, whether they lived locally, what language they spoke, or whether any visit led to continued occupation. It cannot support an invented hunting party, a named 'first settler', or a claim that Ireland possessed a settled population in 31,275 BCE.

There is a useful comparison in the later Irish record. At Alice and Gwendoline Cave in County Clare, a brown-bear kneecap bearing cut marks has been directly dated to calibrated ranges of roughly 12,890–12,678 cal BP and 12,680–12,252 cal BP. That terminal-Pleistocene find has been published as evidence of human activity, while its cave context and implications have also been debated. Subsequent excavation showed that much of the cave sediment had arrived through natural processes. The lesson applies even more strongly to Castlepook: old bones can illuminate possibilities, but rigorous interpretation depends on taphonomy, independent dating, secure stratigraphy and reproducible study.

Society Beyond Recovery

There is no evidence from Ireland around this point for political communities, rulers, territorial states, diplomacy or organised warfare. Equally, there is no Irish evidence for houses, clothing, family structure, burial practice, ritual sites, art, music, language, teaching, exchange networks or formal religion. These are not neglected subjects; they are questions for which the surviving Irish record currently has no dependable answer. A cave bone with a possible cut mark may imply the use of a sharp tool and knowledge of carcass processing, but it does not disclose a social system.

Across north-western Europe, Homo sapiens groups of the Upper Palaeolithic did make sophisticated stone tools, hunt and scavenge large animals, maintain social ties across landscapes, and in some places create ornaments and cave art. Those wider comparisons establish what humans were capable of, not what occurred in Ireland. It is reasonable to infer that any visitors capable of processing a reindeer would have needed practical knowledge, co-operation and mobility. It is not reasonable to transfer the settlements, art traditions or political relationships of France, Britain or continental Europe directly to County Cork without Irish finds.

Economy, Movement and Risk

If people did reach Ireland in this period, their economy would have been one of mobile foraging rather than farming. There were no crops, domestic livestock, pottery villages, metal tools or trade ports. Reindeer could have offered meat, fat, hides, sinew, antler and bone; large herbivores may have been

important resources but also difficult and dangerous targets. Carnivores mattered as competitors as well as scavengers. Spotted hyaenas at Castlepook are particularly revealing: caves could serve as carnivore dens and bone accumulators, making them attractive archives for modern researchers but risky shelters for humans.

Seasonality was probably decisive. Animal movements, snow cover, access to freshwater and the availability of fuel and plant foods would all have shaped where small groups could travel and how long they could remain. The apparent richness of Castlepook's fauna should not be confused with abundance everywhere or throughout the year. Ice Age ecosystems could be productive in brief summers yet punishingly exposed in winter. The later expansion of ice during the Last Glacial Maximum probably erased many routes, habitats and traces of earlier activity, helping explain why Ireland's record for this era is so sparse.

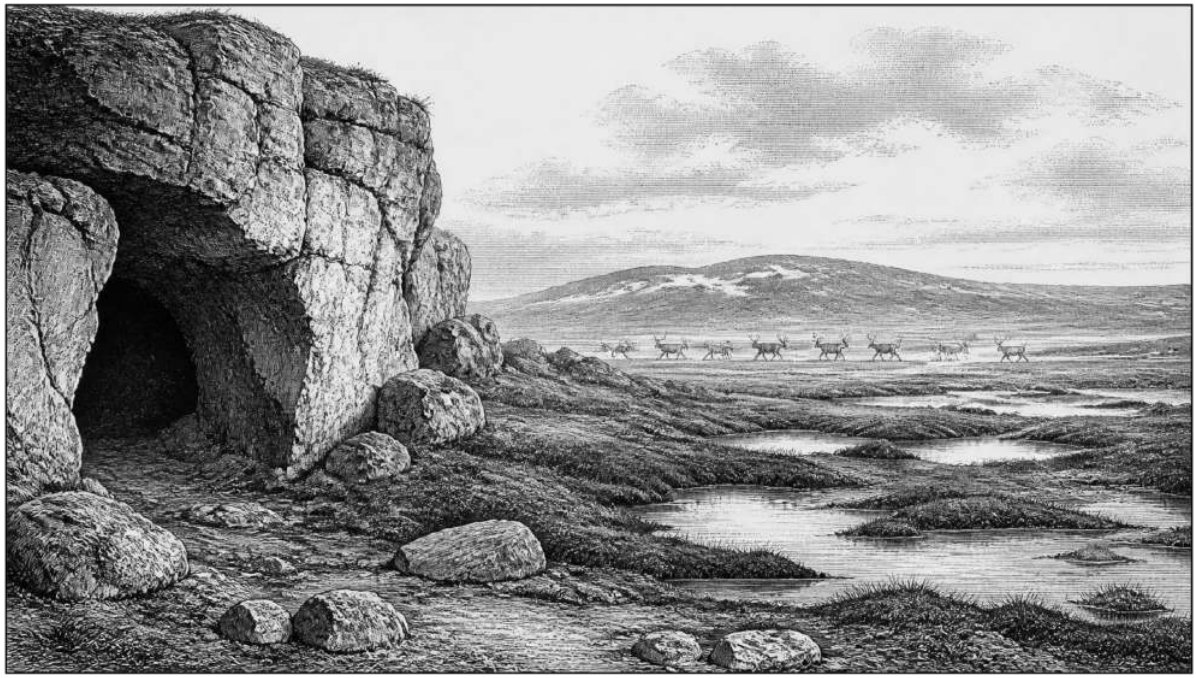
What This Year Can Mean

For Ireland, 31,275 BCE is best understood not as an anniversary but as a carefully bounded horizon of inquiry. Around 33,224 cal BP, Ireland lay within a volatile pre-maximum Ice Age world connected to wider European environments by lowered seas and changing terrain. Castlepook Cave demonstrates that cold-adapted mammals, including reindeer and spotted hyaena, reached this western edge of Europe. Its reindeer femur raises the consequential possibility of human handling. At present, however, it remains a possible trace rather than a foundation for a detailed national prehistory. The most important development is therefore methodological as much as historical: re-dating old collections, re-excavating surviving deposits and resisting the temptation to convert one compelling bone into a fully peopled past.

Chapter 027 of 100

31274 BCE

Castlepook’s Closing Corridor [27]



“31,274 BCE” is a useful modern label, not a date at which Ireland’s inhabitants recorded an event. At this depth of time, calendar-year precision is unavailable. Converting the label conventionally places it at about 33,200 calibrated years before present (cal BP, with “present” fixed at AD 1950), within the later part of Marine Isotope Stage 3, or MIS 3. Dates for this period come as ranges, often with substantial uncertainties, and Ireland’s evidence is especially fragmentary. The responsible history of this moment is therefore not one of named rulers, battles or settlements, but of a changing cold-world landscape, cave deposits and animal bones.

A Late MIS 3 Landscape

Ireland lay on the north-western edge of Europe’s inhabited and changing Ice Age world. MIS 3, broadly c. 57,000–29,000 years ago, was not one uniform freeze. Greenland ice-core records and European environmental archives show abrupt swings between comparatively milder interstadials and colder stadials. Such shifts altered vegetation, snow cover, river behaviour and the practical routes available to animals and people. The numbered year in this article falls during the long climatic deterioration that preceded the fullest development of the last British–Irish Ice Sheet.

This was not yet the Last Glacial Maximum in its conventional sense. The British–Irish Ice Sheet reached its greatest overall extent later, with major advances and changing sectoral maxima broadly between c. 30,000 and 22,000 years before present; the wider global glacial maximum belongs mainly to c. 26,500–19,000 years ago. Nevertheless, ice was already an active and consequential force. It was growing in the mountains and across surrounding seas, and its future expansion would remove, bury or rework much of the terrestrial evidence from this earlier interval.

That later destruction is central to the difficulty of writing Ireland’s deep prehistory. A landscape repeatedly overridden by ice does not preserve campsites, hearths or footprints easily. The surviving record is uneven: protected caves, sediment trapped beneath glacial deposits, offshore cores, pollen, plant macrofossils, insects, animal remains and the landforms left when ice finally retreated. Each source records a different duration and place. None can securely describe an exact day, season or political community in 31,274 BCE.

Open Ground, Pools and Wind

The best Irish evidence for a cold late-MIS-3 environment comes from scattered natural archives rather than a single landscape preserved intact. At Derryvree near Maguiresbridge in County Fermanagh, roadworks exposed freshwater silts and fine sands between two tills in a drumlin. Radiocarbon results from the organic deposit gave 30,500 +1,170/−1,030 radiocarbon years BP, a measurement which must not be treated as an exact equivalent of the article’s BCE label. Yet it belongs to the same broad Late Pleistocene setting and offers Ireland’s most revealing local environmental comparison.

Derryvree’s pollen, mosses, seeds and animal remains point to open tundra vegetation and periglacial conditions. Sedges, mosses and cold-adapted herbaceous plants occurred around shallow freshwater habitats. Plants such as mountain-avens, Arctic willow, dwarf birch, bogbean and water-milfoil have been identified from the wider inter-till record. The evidence does not recreate a continuous carpet of vegetation across all Ireland; indeed, sparse cover is likely in exposed ground. It does show that, where water and sheltered sedimentary basins permitted, a low, treeless mosaic of wet ground, pools and tundra plants could persist.

Such terrain should not be imagined as lifeless white desert. In summer, short growing seasons could produce grasses, herbs, mosses and insect activity; in winter, frost, snow and wind would have imposed severe constraints. Rivers and temporary ponds shifted with meltwater and freezing. The familiar outlines of modern Irish farming country, woodland and bog had not yet formed. Nor did the modern shoreline exist. Lower global sea levels exposed broad shelves, although ice, shifting coasts, water crossings and local topography determined whether particular routes were usable at any given time.

Castlepook’s Faunal Archive

The principal Irish cave archive for this interval is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations undertaken between 1904 and 1908 produced a remarkable collection, now substantially held by the National Museum of Ireland. It includes reindeer, brown bear, wolf, fox, mountain hare, lemmings, giant deer, woolly mammoth and spotted hyaena. Not every species necessarily lived together at one moment, and antiquarian excavation methods did not recover the contextual detail expected today. Still, modern re-dating has confirmed that Castlepook contains important fauna from before as well as after the Last Glacial Maximum.

Spotted hyaena is particularly evocative. Its presence is firm evidence that carnivores characteristic of Pleistocene north-west Europe reached Ireland during parts of this cold stage. Hyenas could carry prey remains into caves, scatter and chew bones, and create deposits that resemble a human food discard only superficially. Brown bears may have used caves differently, including as shelter or dens. Reindeer suggest open grazing country, while lemmings and mountain hare reinforce the picture of cold-adapted habitats.

Mammoth and giant-deer remains demonstrate that large herbivores entered Ireland at some points in the Late Pleistocene, but their bones do not license a claim that they were common, permanent or all contemporaneous around 31,274 BCE.

Recent work has made the chronology more secure and, at the same time, more cautious. Improved accelerator mass spectrometry and chemical pretreatment produced dates for several southern Irish cave bones thousands of radiocarbon years older than earlier determinations. The revision indicates that some animals, including giant deer and spotted hyaena, were present in Ireland during MIS 3 and may have disappeared locally before the Last Glacial Maximum. It also demonstrates why old dates and old collections must be revisited rather than repeated as settled fact.

The Reindeer Bone Question

Castlepook matters to human history because a reindeer femur, recovered in 1972 and subsequently dated to roughly 33,000 years ago, bears a single deep linear mark. Zooarchaeologist Ruth Carden has interpreted the incision as potentially made by a sharp stone tool during butchery. If that interpretation is sustained by further microscopic study, comparison and securely stratified finds, it would be evidence for a fleeting human presence in Ireland far earlier than the long-accepted terminal-Pleistocene record.

But the conditional is essential. One modified bone is not a settlement, a toolkit, a hearth, a burial or proof of a resident population. The bone lacks the secure excavated context that would allow archaeologists to link it confidently to a particular occupation surface. Carnivore damage, sediment movement, excavation history and the limited nature of the mark all require scrutiny. The National Museum of Ireland still rightly describes Palaeolithic human presence in Ireland as unproven, while acknowledging that the island’s Pleistocene faunas are scientifically important. The best securely dated published evidence for human activity remains much later: a butchered brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to c. 12,810–12,590 cal BP.

Accordingly, no political affairs, diplomacy, conflict, religion, language, art or learning can responsibly be assigned to Ireland in this year. There are no known Irish communities from which to infer leadership, territory or belief. If people did reach the island during late MIS 3, they would have been mobile Upper Palaeolithic hunter-gatherers operating within wider north-west European networks. They might have travelled in small groups, used perishable equipment and sought animal resources, shelter and workable stone. That is a regional archaeological inference, not an established account of Irish life.

Connections Without States

Economic “trade” and diplomacy are equally inappropriate in their later historical meanings. There is no evidence for exchange institutions or enduring political entities in Ireland at this time. What can be discussed is ecological connectivity. Animals reached the island when conditions, sea level and ice geometry allowed. Their movements imply that Ireland was not always biologically isolated, although the routes and timings remain debated. The narrow seas were landscapes in transition, not fixed modern barriers; low sea level did not automatically create a simple, dry and safe land bridge.

Any human visit, should the Castlepook mark eventually be verified, would belong to this same geography of movement. A crossing to Ireland would have demanded knowledge, planning and favourable conditions, whether by a terrestrial corridor, a short water passage or some combination of routes changing through time. Yet the archaeological silence after the possible trace is as significant as the

trace itself. There is no demonstrated continuous occupation through the advancing ice. The later ice sheet would have made much of Ireland profoundly inhospitable and would have erased or concealed evidence of earlier visits.

What This Year Can Mean

For Ireland, 31,274 BCE is best understood as an evidence horizon at the edge of a major glacial transformation. Cold, largely open environments supported mobile animal populations in at least some regions. Castlepook Cave preserves the most powerful reminder: Ireland’s Ice Age fauna included creatures now absent from the island, among them reindeer and spotted hyaena. Derryvree preserves a complementary environmental record of tundra plants and freshwater habitats beneath later glacial deposits.

The period has no recoverable Irish state, tribe or calendar, and perhaps no demonstrable human population. Its importance lies elsewhere. It establishes the deep environmental preconditions from which Ireland’s later human history emerged, and it shows how scientific knowledge advances: not by filling silence with stories, but by testing bones, recalibrating dates, excavating surviving deposits and allowing a single promising mark to remain a question until the evidence is strong enough to answer it.

Chapter 028 of 100

31273 BCE

BIRM-166’s Organic Bed [28]



The label 31,273 BCE cannot identify a day, season or year in the lived experience of Ice Age Ireland. It is a modern calendar conversion, roughly 33,200 years before AD 1950, and the scientific evidence available is nowhere near precise enough to distinguish one calendar year from another. The responsible historical setting is therefore a calibrated range: the late part of Marine Isotope Stage 3 (MIS 3), before the Last Glacial Maximum. Ireland’s strongest local evidence comes not from a settlement but from a small, waterlogged deposit exposed in a County Fermanagh drumlin at Derryvree, near Maguiresbridge. Its laboratory number, BIRM-166, has become shorthand for an exceptionally rare glimpse of an Irish landscape between episodes of glaciation.

A Date Within a Range

Derryvree was revealed by a road cutting in 1969. Beneath the drumlin’s surface lay a sequence of glacial sediments, then freshwater silts and fine sands rich in organic remains, then a further sheet of till. Till is debris laid down directly by glacier ice. The intervening organic bed records a time when plants grew, water stood or flowed locally, and sediment accumulated before later ice or ice-related processes sealed the evidence beneath it.

A radiocarbon determination from this deposit gave a conventional age of 30,500 radiocarbon years before present, with a substantial uncertainty. When calibrated, later scholarship has commonly expressed the probable calendar age as about 36,900–31,700 years before present: approximately 34,950–29,750 BCE. The notional year 31,273 BCE falls inside that broad interval, but it cannot be pinned to a particular layer, event or climatic episode within it. Calibration curves, sample contamination, the old age of the measurement and the fact that organic sediment can contain material of slightly differing ages all demand caution.

This is not a minor technical qualification. It defines what can honestly be said. Derryvree provides evidence for a cold, ice-free local environment sometime across a span of several millennia; it does not report what happened across all Ireland in one numbered year. The prehistoric past is reconstructed from such overlapping ranges, stratigraphic relationships and comparisons between sites, not from an annual chronicle.

A Wetland Between Glaciers

The plants and insects recovered from Derryvree indicate an open tundra or muskeg-like landscape. Mosses, sedges and cold-adapted herbs occupied wet ground, with shallow pools and organic mud in hollows. Fossil evidence includes aquatic and waterside plants such as bogbean and water-milfoil, alongside species associated with cold, exposed conditions. Insects reinforce the picture of a periglacial wetland: not a uniform frozen desert, but a patchwork of saturated ground, standing water, sparse vegetation and seasonally available plant matter.

That reconstruction is local, not a map of the island. A basin beneath a drumlin preserves what grew in and around its own catchment particularly well; it cannot tell us whether every coast, valley and upland looked the same. Yet it decisively challenges any simple image of Ireland as continuously buried beneath an unchanging ice sheet. At least at Derryvree, there was a phase in which the ground supported tundra vegetation and freshwater life.

Conditions would nevertheless have been severe. Winter cold, prolonged frost, short growing seasons and periglacial processes shaped the terrain. Ground repeatedly freezing and thawing could disrupt soils and move sediment. Trees were absent from the Derryvree record, so there was no woodland shelter, timber resource or forest canopy. The living landscape was low, open and exposed to wind. In productive summer weeks, however, pools and wet ground could have supported abundant small-scale plant and insect life, attracting grazers and predators to a landscape that was difficult rather than lifeless.

Ice Growth and Uneven Landscapes

At this date Ireland lay within the long, complex build-up towards the maximum of the last British–Irish Ice Sheet. The maximum extent of that ice sheet came later, chiefly around 26,000–23,000 years before present in Irish sectors, rather than at 31,273 BCE. Newer reconstructions emphasise that the advance was asynchronous: ice expanded, altered its flow and reached maximum limits at different times in different regions. It is therefore misleading to say simply that “Ireland was under ice” at the date in question.

The evidence also permits more than one interpretation of the wider glacial history. Derryvree and the older Greenagho organic deposits demonstrate episodes of ice-free ground in north-central Ireland before later glacier advance. Marine shells and sediments around Donegal Bay have been used both to investigate changing relative sea level and to argue about the size and timing of western Irish ice. Some syntheses favour extensive but regionally variable ice well before the global maximum; others emphasise a later major expansion from landscapes that had been at least partly ice-free. The uncertainty is genuine and is part of the history of research, not a gap to conceal.

Crag Cave in County Kerry supplies a separate kind of clue. Uranium-thorium dating shows that calcite formations grew episodically in the cave during MIS 3. In a shallow cave, dripping calcite requires liquid water moving through soil and rock, so these growth pulses are evidence for periods of climatic

amelioration rather than permanently frozen conditions. They do not prove that every Irish region warmed at the same moment, but they support a picture of sharp, millennial-scale climatic fluctuations linked to North Atlantic change.

Animals at Castlepook

County Cork's Castlepook Cave, near Doneraile, offers Ireland's most important faunal archive for this general period. Its deposits have yielded remains attributed to reindeer, woolly mammoth, brown bear, wolf, spotted hyaena, arctic fox, hare and large deer. These animals were not a single herd photographed in time. Cave deposits accumulated through repeated carnivore activity, deaths, scavenging, water movement and nineteenth- and early twentieth-century excavation. Bone dates from the cave likewise span a long interval, and recent re-dating has shown that several older determinations required revision.

Still, the assemblage is valuable. Reindeer and mammoth point to open, cold grassland-tundra habitats; hyaenas and wolves indicate large carnivores able to exploit carcasses; bears and foxes reveal a more varied animal community than a bare ice sheet could sustain. Castlepook was probably a den, scavenging place and trap for bones more often than it was a human camp. The bones tell us that animals moved through southern Irish landscapes during parts of MIS 3. They do not establish stable animal populations across the whole island, nor do they make every identified species contemporary.

The Human Question

One Castlepook reindeer femur has particular importance. It bears a deep mark interpreted by specialist examination as having been made on fresh bone with a sharp stone tool during butchery. The bone has been publicised as dating to around 33,000 BCE, close in broad terms to the calendar label considered here. If that interpretation is sustained, it is evidence that one or more Upper Palaeolithic people processed a reindeer in Ireland far earlier than the formerly accepted record of human activity.

But the evidence is necessarily narrow. A cut-marked animal bone is not a house, hearth, tool-kit, burial ground or settlement. It cannot reveal the number of people involved, their language, kinship, identity, route to Ireland, length of stay or whether they returned. It does not prove continuous occupation. No securely associated stone-tool assemblage has yet supplied the fuller archaeological context that would turn this fleeting signal into a settled history of a community. The most prudent conclusion is that Ireland may have received very small, mobile human groups during this period, probably following seasonal resources, while the scale and continuity of their presence remain unknown.

No Polities, No Proven Trade

There is no evidence for political institutions, chiefs, territories, diplomacy, warfare or organised trade in Ireland at 31,273 BCE. Nor is there evidence for farms, crops, livestock, pottery, monuments, metalwork, writing or formal religious sites. To impose such categories on Derryvree or Castlepook would be to project much later Irish prehistory backwards into a radically different world.

If people were present, their economy would have depended on knowledge of animals, weather, stone and seasonal movement. Processing a carcass would imply practical skill, sharing and planning, but not necessarily permanent settlement. Any contact with Britain or continental Europe is an inference from

geography and the wider distribution of Upper Palaeolithic populations, not something demonstrated by an Irish route, boat or traded object. Lower sea levels changed coastlines, yet the precise combinations of sea, ice, exposed shelf and passable terrain varied through time. The crossing problem remains open.

What This Year Can Mean

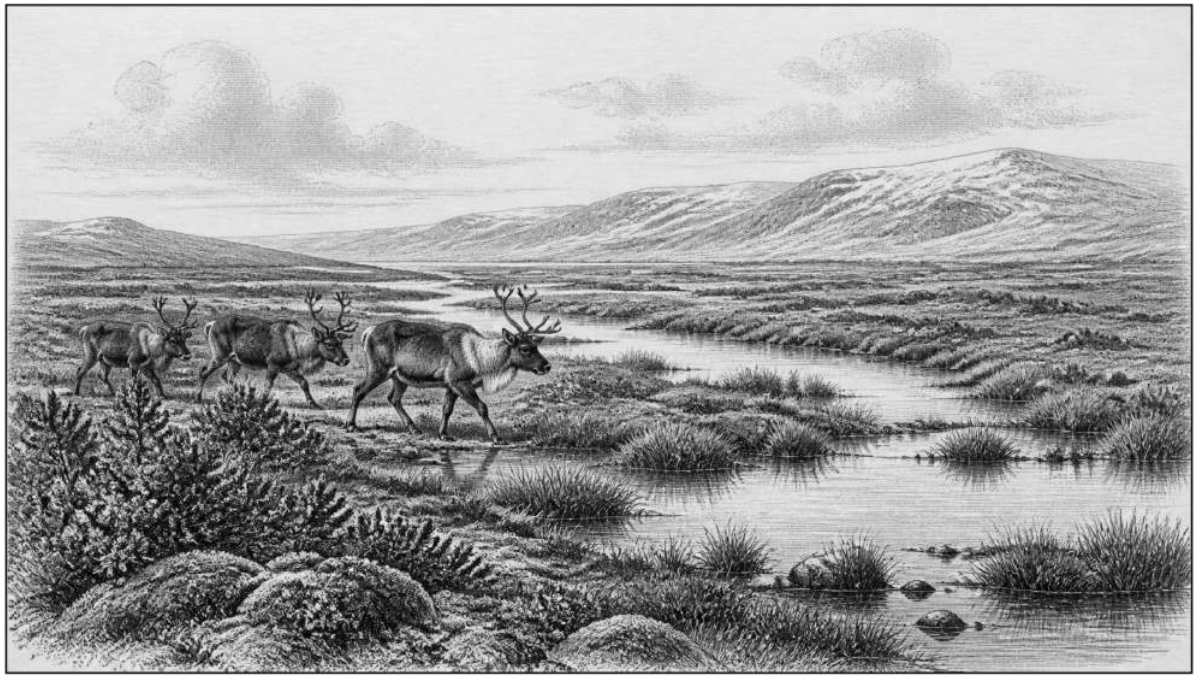
The central Irish development represented by 31,273 BCE is environmental possibility. At Derryvree, freshwater sediment, tundra plants and insects document a cold but habitable local landscape between glacial episodes. At Castlepook, animal remains show that large mammals and predators used parts of the island during the broader period; one marked reindeer bone raises the possibility of human butchery. Crag Cave records climatic pulses in the southwest. Together, these archives replace a blank Ice Age Ireland with a changing, regionally uneven world.

They do not yield an annual narrative, a named people or a national event. Their value lies precisely in their restraint: mud beneath a drumlin, calcite in a cave, and bones in a Cork limestone chamber show what was present, while reminding us how much remains beyond recovery. For this distant point in Irish history, the most accurate story is not of a kingdom or a battle, but of life persisting in the narrow intervals between ice.

Chapter 029 of 100

31272 BCE

Derryvree’s Open Pools [29]



The label 31,272 BCE gives a false impression of precision. No Irish document, settlement layer or environmental record can tell us what happened in that individual modern calendar year. Expressed in the conventions used by Quaternary scientists, it falls roughly 33,200 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). At that depth of time, chronology is built from radiocarbon determinations, sediment sequences and correlations with ice-core climate records. Each has uncertainty. The responsible history of this moment is therefore not an anniversary narrative, but an account of a cold, changeable Irish landscape represented by wide calibrated ranges.

The closest important evidence comes from Derryvree, near Maguiresbridge in County Fermanagh, and from Castlepook Cave near Doneraile in north County Cork. They do not describe the whole island, and neither preserves a dated village of this age. Together, however, they show that parts of the landmass now called Ireland supported freshwater wetlands and substantial Ice Age animals during a phase before the Last Glacial Maximum reached its fullest extent.

A Date Within a Range

At Derryvree, roadworks exposed fine sands, silts and organic deposits caught between two tills: dense, stony sediments laid down by separate episodes of glacial ice. This order of layers is the crucial fact. It demonstrates that a biologically active freshwater environment existed after one advance of ice and before a later one. An organic sample, BIRM-166, produced a conventional radiocarbon determination of about 30,500 ± 1,100 radiocarbon years before present. Published calibrations have placed it broadly around 36,900–31,700 calendar years before present, while later regional discussions have proposed different modelled positions within that large span.

The nominal year in question lies within the older published calibrated range, but it cannot be identified as the start, height or end of the Derryvree deposit. Radiocarbon years are not calendar years, because atmospheric carbon-14 has varied through time; calibration curves convert one into a probabilistic calendar range, not a pinpoint date. Modern IntCal20 work has further refined the deep radiocarbon timescale, reinforcing the need to treat any apparent single-year correspondence with caution.

MIS 3 was neither a simple thaw nor an unbroken freeze. It was a long glacial interval marked by abrupt shifts in North Atlantic climate. Greenland ice cores divide it into colder stadials and comparatively milder interstadials. Those events provide an international climatic framework, but they cannot be mapped mechanically on to one Fermanagh pool or Cork cave. Ireland sat at the Atlantic edge of Europe, where ice, sea, wind and local topography could produce strongly regional conditions.

Wet Ground Between Ice Sheets

Derryvree is unusually eloquent because organic matter rarely survives repeated glaciation. Its plant remains, pollen and insect evidence point to an open, treeless and waterlogged environment often described as muskeg: mossy, sedge-rich ground with pools and abundant decaying vegetation. Grasses, sedges, juniper and herbs occur in the record. Aquatic and wet-ground plants, including bogbean and water-milfoil, indicate freshwater or saturated ground rather than a featureless frozen desert. Mosses and beetles add detail that pollen alone cannot supply.

That evidence supports a landscape of shallow water, peaty margins, frost-affected soils and short growing seasons. It does not establish that every part of Ireland looked the same. The west-facing uplands, limestone lowlands, river valleys and exposed coasts would have responded differently to snow cover, drainage and proximity to ice. Nor should the word ‘tundra’ conjure an empty white plain. Derryvree’s biological remains show summer growth and standing water, even in a climate severe enough for winter cold and periglacial processes to dominate.

Later ice covered, eroded and redeposited vast areas of Ireland. The two tills enclosing Derryvree are therefore more than geological backdrops: they explain why evidence for this period is so scarce and fragmented. They also warn against assuming continuity. A wetland visible in a favourable phase could be overwhelmed or buried when ice conditions changed. At around 31,272 BCE, Ireland was not approaching a stable post-glacial recovery; it remained within an unstable Ice Age world.

Castlepook’s Animal Archive

Far to the south, Castlepook Cave preserves Ireland’s richest known assemblage of vertebrate remains from before, during and after the last cold stage. The cave has yielded bones of woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, alongside wolf, foxes, hares and lemmings from different episodes. The species demonstrate that Ireland was, at least intermittently, accessible to animal populations also known from Britain and continental north-west Europe. They are powerful evidence against any image of an utterly lifeless island.

Yet the cave must be read carefully. Much of its material was excavated in the early twentieth century, before modern field recording, and water movement, animal activity and later disturbance have complicated the deposits. Individual bones have returned notably different radiocarbon ages. Improved pre-treatment and re-dating have shown that several earlier dates underestimated the antiquity of

Castlepook material; one modern reassessment concluded that some large mammals were present in Ireland during MIS 3 and that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years before present.

Thus Castlepook does not license a scene in which mammoths, hyaenas and reindeer are all placed beside one another on a particular day in 31,272 BCE. It does support a broader conclusion: during the relevant millennia, Irish habitats could sustain a varied cold-stage fauna. Reindeer were especially well suited to open country. Mammoths and giant deer imply extensive feeding grounds, while hyaenas and wolves signal predators and scavengers within that ecological network. Caves themselves may have served as dens, traps, shelters or repositories for bones moved by carnivores and water, rather than as neat snapshots of the countryside outside.

The Human Question

The most consequential, and most limited, evidence for people near this horizon is a reindeer femur from Castlepook. It has been presented as about 33,000 years old and bears a deep mark interpreted as having been made by a sharp stone tool during butchery. If that interpretation is sustained, it is potentially Ireland’s earliest evidence of human handling of an animal, immensely earlier than the long-established record of post-glacial settlement.

The appropriate conclusion remains modest. A marked bone can indicate an episode of carcass processing; it does not demonstrate a permanent population, a camp, a dwelling, a hearth, a tool-making floor, a burial ground or a route used year after year. The bone’s date is the age of the animal material, within a statistical range, not a timestamp for the cut itself. Nor has an associated Upper Palaeolithic stone-tool assemblage yet been recovered at Castlepook to describe the technology of whoever may have made the mark.

It is reasonable to infer that any visitors, if present, would have needed practical knowledge of seasonal weather, animal behaviour and sharp-edged stone tools. Reindeer could supply meat, marrow, hide, sinew, antler and bone. But these are possibilities derived from hunter-gatherer practice elsewhere in Upper Palaeolithic Europe, not direct observations of an Irish household. Archaeology presently supports transient human incursions more readily than a settled Irish community at this date.

No Polities, No Proven Religion

There were no known Irish kingdoms, chiefs, borders, treaties or wars in the political sense. There is no evidence from this period for a named people, language, ethnic identity or diplomatic relationship. It would be misleading to call the land ‘Ireland’ in a national sense: the term is used here only for the territory of the modern island and its changing surrounding shelf. Lower global sea levels altered coastlines and may have made crossings less formidable than today, but fossil animals alone cannot prove a continuous land bridge at this exact time.

Likewise, there is no Irish evidence for shrines, burials, ritual, figurative art, music, teaching institutions or formal learning around this date. Upper Palaeolithic groups elsewhere in Europe created art and used complex social knowledge, but importing such achievements into an undocumented Irish setting would turn comparison into invention. The same restraint applies to economy and trade. There is no evidence for farming, livestock, fields, pottery, metalworking, exchange networks or established trade within Ireland. If people reached the island, subsistence would have depended on mobile foraging and the opportunities of a seasonal landscape, not an agricultural economy.

A Recoverable Deep Past

The most important development around this notional year was environmental, not political: Ireland contained places where freshwater life persisted between advances of ice, while cold-adapted and large grazing mammals ranged through at least some landscapes. Derryvree records sedges, mosses, pools and short-lived biological productivity. Castlepook records animals whose bones survived in limestone chambers, as well as the tantalising possibility that people processed reindeer there.

That is a sparse record, but not an empty one. It shows an Ireland of open ground, wet hollows, severe winters and shifting ecological frontiers. It also sets a necessary limit on storytelling. Around 31,272 BCE, the island’s history cannot responsibly be told through rulers or events. It must be reconstructed from the sediments below a Fermanagh drumlin, the bones in a Cork cave, and the calibrated ranges that connect both to a changing Ice Age world.

Chapter 030 of 100

31271 BCE

Derryvree’s Arctic Waterline [30]



The label 31,271 BCE gives a useful position on a modern timeline, but it must not be mistaken for a recoverable year in Ireland’s human past. No calendar used on the island can be projected so far back, and neither archaeology, radiocarbon dating nor palaeoclimate evidence can identify an occurrence in this particular twelve-month period. The responsible subject is therefore Ireland during the broad interval in which this nominal date falls: the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), before the Last Glacial Maximum.

This was not the familiar green and wooded island of later prehistory. It was a changing northern landscape in which ice, bare ground, shallow freshwater, tundra vegetation and mobile animal populations all mattered. Much of the evidence is fragmentary because subsequent glaciers eroded, rearranged or buried older deposits. Yet a handful of sites, especially Derryvree near Maguiresbridge in County Fermanagh and Castlepook Cave near Doneraile in County Cork, permit a cautious reconstruction. They illuminate episodes and environments, not a national narrative or an event dated precisely to 31,271 BCE.

Dating a Buried Landscape

The nearest valuable environmental archive is Derryvree, where roadworks in 1969 cut through a drumlin and revealed sands, silts and organic sediments between two tills. Till is the unsorted debris deposited by moving glacier ice. The sequence matters as much as any individual specimen: an earlier ice advance left the lower till; freshwater and wetland deposits accumulated during a non-glacial interval; a later glacier overrode and sealed them beneath more till. It is an unusually clear demonstration that this locality had a period of open water and wet ground between episodes of glaciation.

Organic material from the Derryvree deposits produced a conventional radiocarbon determination of about 30,500 ± 1,200 radiocarbon years before present. Calibrated estimates published in discussions of the sequence place it broadly around 36,900–31,700 calendar years BP, or approximately 34,950–29,750 BCE. The modern label 31,271 BCE lies within that broad span. It does not, however, date a particular pool, plant, insect or season, still less establish that all Ireland shared Derryvree's conditions at that instant. Radiocarbon ages require calibration because atmospheric carbon-14 has varied through time, and uncertainties at this depth of time are substantial.

Derryvree is consequently evidence for a local landscape during a lengthy cold-stage interval, rather than a photograph of the whole island. It nonetheless makes an essential point: around the notional date, at least parts of north-central Ireland could sustain freshwater habitats between glacial advances. The island's Ice Age history was not a simple alternation between total ice cover and temperate forest. It included shifting margins, cold but productive refuges, wetlands and open ground.

Wetland Amid Open Tundra

The plant and animal remains in the Derryvree organic beds suggest cold, treeless or very sparsely wooded country. Mosses, sedges and other herbaceous plants were suited to wet soils, while records cited from the deposits include cold-adapted species such as mountain avens, dwarf willow and juniper. These remains support an interpretation of low, open vegetation with damp hollows, shallow pools and patches of more sheltered growth. They do not justify imagining a uniform carpet of tundra from Cork to Donegal. Topography, exposure, drainage and proximity to ice would have made conditions highly local.

Insects and plant macrofossils are especially valuable because they record habitats at a finer scale than a general statement about climate. A wetland basin could preserve aquatic or waterside plants even while surrounding slopes remained dry, frost-shattered and exposed to severe winds. Such a setting offered seasonal resources: edible plants for animals, water, sheltered ground and perhaps corridors along valleys. It would still have been a demanding place, with short growing seasons and abrupt climatic shifts characteristic of the North Atlantic during MIS 3.

There is no evidence for cultivated fields, livestock, houses, monuments, pottery, textile production or managed woodland. None should be inferred from the presence of wetland vegetation. The Derryvree record predates Ireland's securely attested farming communities by tens of millennia and even precedes the island's demonstrable long-term human settlement by a vast interval.

Animals at the Western Edge

The Irish Quaternary Fauna Project and subsequent re-dating work show that Ireland supported a more varied mammal fauna during parts of MIS 3 than older accounts once allowed. Cave and other deposits have yielded evidence from different phases for reindeer, giant deer, brown bear, wolf, Arctic fox, hare, spotted hyaena and woolly mammoth. These animals were not necessarily contemporaries at every site, nor did every species occupy every region simultaneously. Their dated bones instead demonstrate repeated animal access to Ireland before the Last Glacial Maximum.

Castlepook Cave is central to this picture. Its faunal collection was assembled largely through early twentieth-century excavations and comes from deposits whose original layers were disturbed or incompletely recorded. Modern ultrafiltration and accelerator radiocarbon dating have shown that several southern Irish cave bones are older than earlier conventional dates suggested. That revision has

strengthened the case for a pre-Last Glacial Maximum fauna, while also making clear why individual cave finds must be handled carefully: bones may have been moved by carnivores, water, excavation or later disturbance.

Reindeer are particularly evocative, but they should not be made into a symbol of a settled ‘reindeer people’ in Ireland. Herds may have entered during favourable windows, following open-country forage across landscapes that differed sharply from the later island. Predators could have followed them. A cave containing animal bone was not automatically a human camp; it may have been a carnivore den, a trap, a place where remains washed in, or some combination of these processes over thousands of years.

Ice, Sea and Changing Connections

At this time the British–Irish Ice Sheet was developing towards its later maximum, but its build-up was neither instantaneous nor spatially uniform. Research on Derryvree, Greenagho and western Irish landforms indicates that some areas retained ice-free or less heavily glaciated intervals before the fullest Last Glacial Maximum conditions. Large-scale reconstructions are strongest for the period from roughly 31,000 calendar years BP onwards; they show a dynamic ice sheet whose advancing and retreating margins transformed drainage, sediment movement and access to habitats.

It would be wrong to state that Ireland was wholly ice-free in 31,271 BCE, or wholly covered by ice. The evidence supports a mosaic interpreted from deposits of different ages and places. Derryvree records freshwater conditions in Fermanagh during one interval; mountain trimlines, tills, offshore sediments and exposure dates constrain ice elsewhere and often later. The later Last Glacial Maximum, conventionally placed at about 26,000–20,000 years ago, would erase or conceal much of the evidence from the preceding period.

Sea levels were lower than today because much water was stored in continental ice sheets. That changed the configuration of coasts and shallow seas, but it does not permit a simple claim of a dry land bridge from Ireland to Britain at this date. Connections and barriers varied with sea level, ice extent, marine channels and the practical realities of traversing cold terrain. For large mammals, intermittent dispersal routes are a reasonable interpretation; for people, the evidence is much less secure.

The Human Question at Castlepook

A fragment of reindeer femur from Castlepook has attracted attention because it bears a deep mark interpreted by its analyst as damage made with a sharp stone tool during fresh-bone butchery. It has been associated in heritage publications with an age of about 33,000 BCE. If that interpretation and chronological association are sustained, it would be an exceptionally early indication that one or more people handled a reindeer carcass in Ireland during the Upper Palaeolithic.

The limits are crucial. The bone comes from an antiquarian cave collection rather than a modernly excavated occupation surface. No stone tool has been found in direct association with it; nor is there a securely associated hearth, shelter, food-processing area, human bone or repeated set of butchery marks. The mark cannot tell us whether people killed the animal, scavenged it, or processed it elsewhere before carnivores or natural processes brought the bone into the cave. The National Museum of Ireland accordingly continues to describe clear evidence for Palaeolithic human presence as absent.

Thus the most careful conclusion is not that Ireland possessed a population, tribe, polity or permanent settlement in 31,271 BCE. It is that Castlepook raises a serious possibility of fleeting human activity during a period when reindeer and other cold-stage animals reached the island. Any visitors would

probably have been highly mobile foragers using perishable gear and stone tools, but even that is an inference from wider Upper Palaeolithic Europe rather than something demonstrated by an Irish settlement.

No Kingdoms, No Recorded Beliefs

Political affairs, diplomacy and organised warfare cannot be recovered for Ireland at this date. There are no documents, named groups, forts, graves, weapons assemblages or settlement plans from which institutions or conflicts could responsibly be inferred. Equally, there is no evidence for formal religion, ritual monuments, art traditions or systems of learning on the island. Silence in the record is not proof that no person ever travelled there; it is a warning against supplying stories that the evidence cannot bear.

Nor is there evidence for trade in the usual historical sense. The movement of animals and the possible movement of people across changing western European landscapes are not evidence for exchange networks, commerce or diplomatic contact. The most meaningful ‘economy’ visible here is ecological: plants captured energy during short summers; herbivores converted it into meat and hides; predators and scavengers exploited herds and carcasses; ice and meltwater repeatedly altered the ground on which all moved.

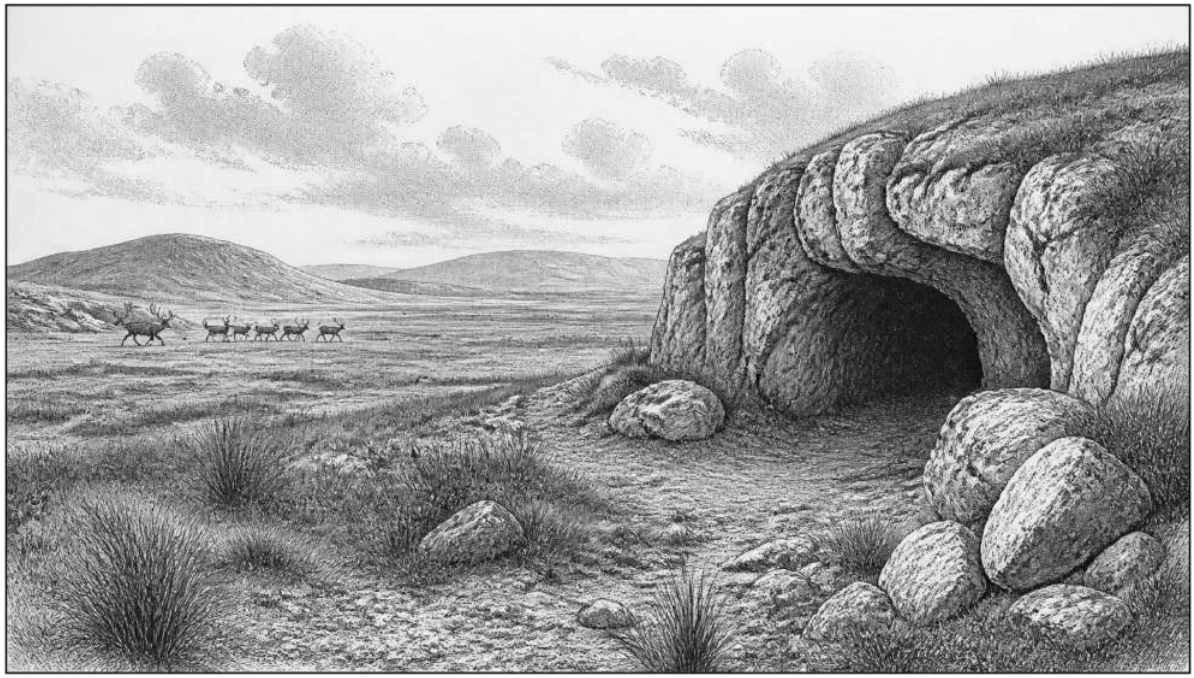
What This Date Can Mean

For Ireland, 31,271 BCE is best understood as a point within a long environmental interval rather than a year of recorded history. Derryvree preserves the strongest local testimony: an Arctic-alpine wetland existed between glacial episodes in Fermanagh. Castlepook demonstrates that an unexpectedly rich fauna reached southern Ireland and preserves a provocative, still limited possible trace of human carcass processing. Together they replace an empty Ice Age map with a more complicated one—one of water, vegetation, animals, unstable ice margins and perhaps occasional people at Europe’s north-western edge.

Chapter 031 of 100

31270 BCE

Doneraile’s Single Cutmark [31]



“31,270 BCE” is a modern way of placing a point very deep in time, not a year for which Ireland possesses a historical record. Mechanically, it lies about 33,220 years before the conventional radiocarbon reference year of 1950, but neither written evidence nor an archaeological sequence permits calendar-year precision on the island at this depth. The responsible framework is therefore broad: late Pleistocene Ireland during Marine Isotope Stage 3 (MIS 3), before the climatic nadir known as the Last Glacial Maximum. Individual scientific dates carry ranges, methods and uncertainties; some Irish deposits are difficult to correlate securely at all. What can be described is an Ice Age landscape in transition, and the unusually important but problematic evidence from Castlepook Cave near Doneraile, County Cork.

A Date Without a Chronicle

This was not an Irish “year” in any political or cultural sense. There were no kingdoms, named peoples, towns, treaties or institutions that can be recovered from the evidence. No person is known. There is no demonstrable settlement, hearth, tool-kit, grave, artwork or structure in Ireland that can securely be assigned to this precise point in time. It is consequently misleading to imagine a continuous national community extending back to 31,270 BCE. Ireland was part of a changing north-west European physical landscape, and the sparse evidence that survives concerns animal remains, cave sediments, landforms and deposits shaped by ice, water and frost.

The wider climatic record does, however, give the date context. Around 33,000 calendar years before present, the North Atlantic world was marked by abrupt millennial-scale swings between colder stadials and relatively milder interstadials. The Greenland ice-core chronology identifies an interstadial phase, GI-5.2, in this general interval, but that does not supply a weather report for Cork, Fermanagh or Donegal. It

is an external chronological framework against which Irish evidence may cautiously be compared. Local conditions depended upon altitude, proximity to ice margins, the sea, prevailing winds and the changing extent of the British–Irish Ice Sheet.

Before Maximum Ice

At this date Ireland was not yet at the Last Glacial Maximum, conventionally placed broadly between about 26,500 and 19,000 years ago. The later maximum brought extensive ice cover across Ireland and the surrounding continental shelf. Yet the growth of that ice mass was not a simple, island-wide advance occurring everywhere at once. The major BRITICE-CHRONO reconstruction finds that advance, maximum extent and retreat differed between sectors of the British–Irish Ice Sheet; maximum positions were reached at different times, roughly between 30,000 and 22,000 years ago. Thus 31,270 BCE belongs to an early and poorly resolved part of a major glacial build-up, rather than to a settled picture of an island wholly buried beneath ice.

That qualification matters. Much of the present Irish landscape has been remodelled by later ice, especially during and after the Last Glacial Maximum. Glaciers eroded bedrock, moved sediment, reshaped valleys and deposited tills, drumlins, moraines and meltwater gravels. They also removed or mixed older archaeological deposits. Absence of campsites is therefore not proof that no humans ever entered Ireland during MIS 3; it is also a consequence of the poor odds of preservation and discovery. Conversely, an isolated bone or surface mark cannot, by itself, establish a settled population.

Regional reconstructions underline the complexity. Donegal later developed an independent ice-dispersal centre within the larger British–Irish Ice Sheet. In the west and offshore, marine geophysical work shows that ice eventually reached far onto the continental shelf. Southern Ireland has its own contested record of ice limits and re-advances. For the period around 31,270 BCE, the most defensible picture is therefore one of severe, changeable environments, with ice and periglacial processes increasingly important, rather than a map with confidently drawn coastlines, vegetation zones or inhabited districts.

Castlepook’s Faunal Archive

The strongest directly relevant evidence comes from Castlepook Cave, also called Mammoth Cave or Doneraile Cave, in north County Cork. Excavations undertaken between 1904 and 1913 recovered a remarkable concentration of Pleistocene animal remains from passages in Carboniferous limestone. The assemblage has included mammoth, reindeer, giant deer, brown bear, wolf, fox, mountain hare, Arctic and Norway lemmings, and spotted hyaena. Taken together, these finds show that southern Ireland was available to a distinctive cold-stage fauna during parts of the late Pleistocene. They do not show that all these animals lived together at the same moment, in the same numbers, or in the exact landscape represented by 31,270 BCE.

That distinction is especially important because Castlepook is a cave archive, not a sealed hunting camp. Carnivores can carry carcass parts into caves; water, sediment movement and later animals can disturb deposits; nineteenth- and early twentieth-century excavation methods, although valuable, did not meet modern standards. Some younger material was found among older remains. The Irish Quaternary Fauna Project therefore treated cave collections with caution and used accelerator radiocarbon dating to

test the ages of selected bones. More recent work has shown that improved preparation and measurement can substantially alter the apparent ages of some Castlepook specimens. The assemblage is immensely informative, but it is neither a single event nor a simple calendar.

A mammoth bone from Castlepook once produced a radiocarbon result of 33,400 ± 1,200 BP, an uncalibrated measurement that helped place part of the fauna in MIS 3. Subsequent reassessment has argued that some faunal components are older than earlier results implied, and that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years BP. This does not erase the importance of the cave. Instead, it demonstrates why the date of an animal, the date of deposition, and the date of human activity must be kept separate.

The Reindeer Femur

The object most closely associated in public interpretation with c. 31,000 BCE is a reindeer femur from Castlepook. County Cork heritage material identifies it as bearing a single mark considered by palaeozoologist Ruth Carden to have been made by a sharp stone tool during butchery. If that diagnosis is sustained, it would be evidence that people handled a reindeer in Ireland during the Upper Palaeolithic, far earlier than the formerly accepted evidence for human presence. It would be a striking discovery: not a settlement or a named hunter, but a moment of contact between people and a carcass in an Ice Age ecosystem.

However, this must remain a carefully framed interpretation rather than a foundation for detailed storytelling. The femur was recovered from an old cave collection rather than a modern excavation of an undisturbed floor. The apparent tool mark is a taphonomic judgement about how a surface was modified; the date of the bone establishes the age of the animal, not automatically the circumstances of the incision. The cave’s carnivore activity supplies a plausible alternative history for how discarded or scavenged remains reached its passages. No securely associated stone blade, spear point, hearth or habitation surface has yet been recovered in Ireland for this proposed episode. A single cutmark may point to a brief human incursion; it cannot demonstrate permanent occupation.

This uncertainty is not a weakness to conceal but the central historical fact. Archaeology advances by asking whether evidence can survive repeated scrutiny. Reanalysis of museum collections, microscopic examination of marks, direct dating of additional bones, sedimentary ancient-DNA work and fresh cave excavation may clarify the question. Until then, the responsible conclusion is modest: a reindeer bone from Castlepook offers a potentially significant indication of human butchery in late Pleistocene Ireland, but it does not permit certainty about population size, ancestry, language, route of arrival or duration of stay.

Life in a Cold Landscape

The fauna nevertheless permits a cautious reconstruction of the ecological setting. Reindeer and lemmings are consistent with open, cold environments; mammoth and giant deer indicate large-herbivore opportunities during suitable phases; wolves and spotted hyaenas reveal a food web with major predators and scavengers. Such associations are often described as mammoth-steppe or tundra-steppe, but those labels should not imply a uniform plain across all Ireland. Vegetation and terrain could have varied sharply between exposed uplands, sheltered valleys, river margins, cave districts and land close to glacier fronts.

Evidence from Derryvree and nearby Maguiresbridge in County Fermanagh illustrates why environmental reconstruction needs local archives. Organic sediments preserved between tills have yielded plant macrofossils and insects indicating cold, open wetland conditions during an earlier Middle Midlandian interstadial. Mosses, sedges, bogbean, dwarf willow, mountain-avens and other taxa point to pools, marshy ground and treeless tundra-like vegetation. These deposits are not securely dated to 31,270 BCE, nor should Fermanagh's wetland be treated as a portrait of north Cork. Their value is comparative: they demonstrate the kinds of detailed evidence that can survive from Irish cold-stage intervals and the environmental mosaics that broad labels can hide.

If people did enter Ireland in the Castlepook period, they would have been highly mobile hunter-gatherers operating within this unstable ecological world. Following animal herds, processing carcasses, exploiting shelter and moving seasonally are reasonable possibilities drawn from Upper Palaeolithic practice elsewhere in north-west Europe. They are not direct observations from Ireland. There is no Irish evidence at this date for farming, herding, pottery, metalworking, weaving, monument building, long-distance trade or permanent village life. Nor is there evidence for political authority, organised warfare, diplomacy, formal religion or learning in the later written sense.

What Cannot Be Recovered

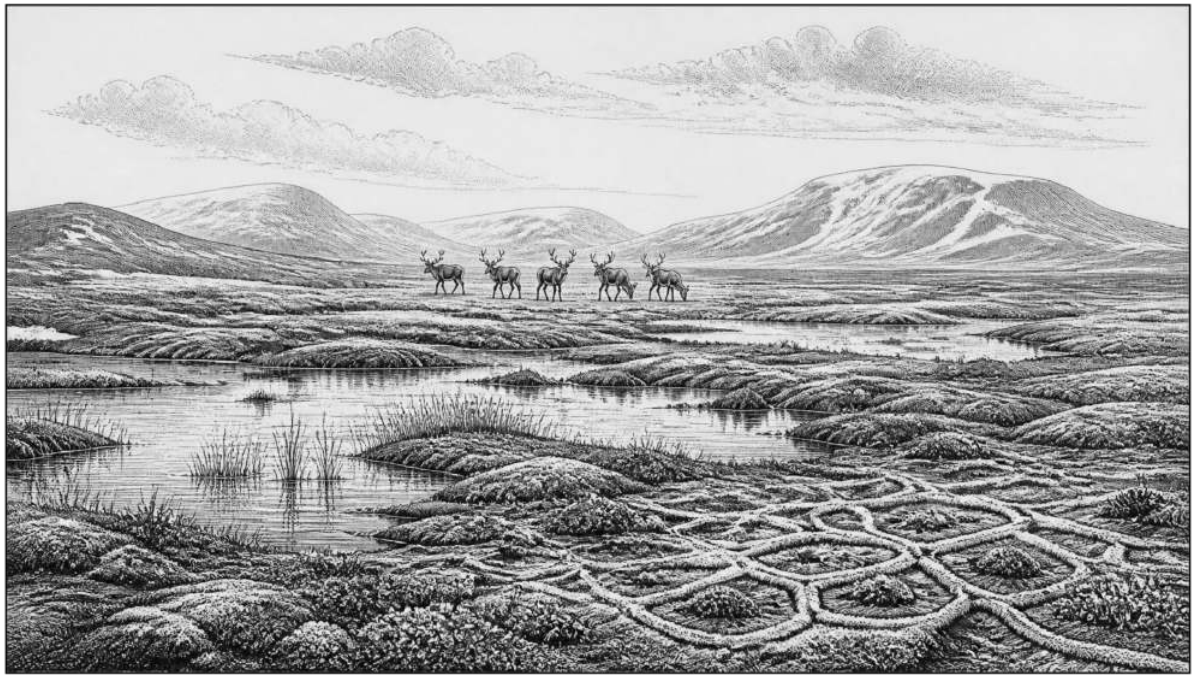
Religion and culture are almost wholly beyond recovery here. A cut bone may record subsistence, but it tells us nothing secure about beliefs, ritual, kinship or language. The absence of evidence for exchange does not prove that people carried nothing between Ireland and Britain or continental Europe; during low sea-level phases the geography of the Irish Sea region differed greatly from today, and movements could have occurred through landscapes now drowned or destroyed. Yet no direct Irish evidence currently supports a trade network at 31,270 BCE. It is better to acknowledge that silence than to populate it with imagined tribes and voyages.

For Ireland around 31,270 BCE, then, the principal development was environmental rather than political: the island lay within a volatile late-glacial world on the approach to more extensive ice-sheet conditions. Castlepook Cave preserves evidence that cold-adapted and large mammals reached southern Ireland, while one marked reindeer bone raises the possibility of a very early human encounter. Its importance lies precisely in its scale: a single, contested trace that asks a large question about Ireland's human past, while reminding us how little a calendar year can reveal when the archive is ice, bone and stone.

Chapter 032 of 100

31269 BCE

Derryvree’s Open-Pool Tundra [32]



The label 31,269 BCE is useful for ordering a long chronology, but it cannot identify a recoverable year in Irish prehistory. No one in Ireland counted time by this calendar, and neither radiocarbon dating, cave deposits nor glacial sediments can isolate a single season, household or event so far back. In the conventional archaeological scale of years before AD 1950, the label falls at roughly 33,200 years ago. It belongs to the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3): an unstable part of the last Ice Age, before the fullest expansion of the last British–Irish Ice Sheet.

The responsible history for this point is therefore not one of named rulers, settlements or battles. It is a history assembled from unusually fragile traces: freshwater silts sealed beneath ice-laid deposits in County Fermanagh; cave bones from north County Cork; calcite laid down in a Kerry cave when liquid water could percolate underground; and the wider pattern of glacial landforms on land and beneath the surrounding seas. These sources illuminate a changing Irish environment and the possibility, rather than the demonstrated permanence, of human presence.

Calendar Labels and Deep Time

The closest Irish chronological anchor is the Derryvree deposit near Maguiresbridge, County Fermanagh. Its organic sediments produced a radiocarbon result of 30,500 +1,170/−1,030 radiocarbon years BP, conventionally known as Birm-166. When calibrated, this has been published as a broad range of about 36,900–31,700 calibrated years BP. The modern label 31,269 BCE lies within that span, but this is not evidence that every layer at Derryvree, let alone every part of Ireland, dates precisely to that named year. The deposit records an interval whose duration and internal changes cannot be resolved to calendar-year precision.

That distinction matters. A radiocarbon measurement dates organic material, subject to statistical uncertainty and the complexities of calibration; it does not date a map of Ireland or a moment in human history. The Derryvree range has been related broadly to several Greenland interstadials, short-lived warmer episodes registered in ice cores, but it should not be treated as an exact synchronisation with one particular climatic pulse. Around the notional date, Ireland may have contained both locally ice-free ground and expanding ice in different regions or at different moments. The evidence is strong enough to reject a simple image of an island uniformly entombed beneath ice, but not to draw a precise coastline or ice margin for 31,269 BCE.

A Wetland Beneath a Drumlin

Derryvree is important because road excavations in 1969 cut through a drumlin and revealed fine sands and organic freshwater silts trapped between two thick tills. Till is sediment deposited directly by glacier ice. The lower till shows that ice had previously occupied the site; the intervening freshwater sediments show that ice did not cover that locality while they accumulated; and the upper till demonstrates a later return or expansion of ice. This is a stratigraphic sequence of successive environmental regimes, not a village floor or a human campsite.

Its biological contents nevertheless permit a vivid, disciplined reconstruction. Pollen, plant macrofossils, mosses and insect remains indicate open tundra vegetation and a periglacial climate. “Periglacial” does not mean the ground lay underneath a glacier. It denotes a severe cold environment shaped by repeated freezing and thawing, sparse or low vegetation, seasonal water and frost action, near the margins of ice. The insect evidence has been interpreted as pointing to muskeg-like wet ground: shallow open pools rich in plant matter, bordered by mosses and sedges. Derryvree was therefore neither a modern Irish bog nor an empty white wilderness. It was a cold, treeless wetland mosaic, with standing water in sheltered hollows and exposed ground beyond them.

This landscape placed strong limits on life. Long winters, short growing seasons and frozen or waterlogged ground constrained plants and animals alike. Yet the very existence of freshwater sediments and their fossil biota shows that the locality supported more than bare rock and ice. Plant communities could occupy wet margins and disturbed mineral soils. Such habitats supplied grazing, browse, cover and water in a landscape that would have changed rapidly with temperature, snow cover and the proximity of ice.

Ice, Water and Uneven Ireland

Later glaciation has greatly complicated the record. The drumlins, tills, streamlined bedrock and moraines familiar in Ireland are products of moving ice, but their prominent survival does not make them a simple map of one phase. They register advances, changes in flow and retreat across many millennia. Modern reconstructions indicate that the main growth to the extensive Last Glacial Maximum configuration came after the period represented by Derryvree. In broad terms, evidence suggests that much of Ireland was ice-free until about 34,000 years ago, while the ice sheet expanded over a long, regionally uneven interval and reached offshore limits later, around 27,000–23,000 years ago in different sectors.

Thus, 31,269 BCE belongs to an interval of mounting instability rather than the later maximum of continuous, island-wide ice cover. Organic material below till at Greenagho, also in County Fermanagh, provides another indication of ice-free conditions in north-central Ireland earlier in MIS 3. In south-west

Ireland, episodes of speleothem growth at Crag Cave demonstrate that, at intervals during MIS 3, liquid water entered cave systems and temperatures were sufficiently ameliorated for calcite to form. These records do not show a mild climate, nor do they prove that all regions experienced the same conditions at once. They demonstrate variation: a crucial fact in an island whose topography, exposure to the Atlantic, proximity to ice and changing sea levels all mattered.

Lower sea levels altered the geography around Ireland, but it is unwise to imagine a permanent, straightforward land bridge. Ice, sea, rivers, exposed shelves and coastal lowlands changed through time. The movement of mammals from Britain to Ireland is evidence that routes existed during parts of the wider period, yet no surviving route can be assigned to this particular calendar label. Much potential evidence from low-lying coasts and shelves now lies submerged, was later eroded, or was overridden by ice.

Castlepook’s Animal World

In County Cork, Castlepook Cave, also called Mammoth Cave, offers a complementary archive. Excavated principally in the early twentieth century, it yielded Ireland’s most important collection of mammal remains from the last cold stage. The National Museum of Ireland preserves, among other material, a spotted hyena skull from the cave, donated through the Royal Irish Academy’s cave-exploration work. Associated dating and environmental interpretation place hyenas and other mammals moving from Britain into Ireland broadly between about 45,000 and 30,000 years ago.

The cave assemblage shows that a cold-adapted large-animal community ranged through at least parts of Ireland before the coming glacial maximum. Reindeer are especially significant; other finds and recent investigations indicate a fauna including hyaena, brown bear, fox, hare, lemmings and mammoth remains. A cave collection is not a census of a single moment. Bones may have accumulated through natural death, carnivore activity, scavenging, water movement and excavation disturbance, and individual specimens need not all be contemporary. Still, the assemblage decisively widens the environmental picture supplied by Derryvree: Ireland could sustain, or be traversed by, sizeable mammals and formidable predators in a cold open landscape.

The Human Question

One reindeer femur from Castlepook has made this period exceptionally important for Irish archaeology. Modern accelerator radiocarbon dating has placed the bone at roughly 33,000 years ago, close to the broad period under discussion. A deep linear modification has been interpreted as a cut or chop made by a sharp stone tool while the bone was fresh. If that interpretation is confirmed, it would indicate that Upper Palaeolithic people processed a reindeer in Ireland long before the better-attested post-glacial settlement of the island.

It must remain a conditional conclusion. The bone is not accompanied by a securely stratified stone-tool assemblage, hearth, dwelling, human skeleton, burial or repeated occupation surface. Recent excavation at Castlepook has located surviving deposits and additional faunal material, but reported no cultural artefacts in the 2022 fieldwork. The mark is therefore intriguing evidence of possible butchery, not proof of a resident population, a named group or a continuous Irish Palaeolithic tradition. It is equally unsafe to turn one modified bone into a story of a hunting party on a particular day in 31,269 BCE.

What Cannot Yet Be Claimed

There is no evidence for political institutions, chiefs, territorial boundaries, diplomacy or warfare in Ireland at this date. Nor is there evidence for farming, herding, metalworking, long-distance trade in finished goods, formal religious monuments, art, writing or learning institutions. The absence is not proof that no people ever crossed the landscape; it reflects the extraordinary difficulty of preserving and finding traces in a terrain later transformed by ice and sea-level change. But historical restraint requires that absence to be acknowledged.

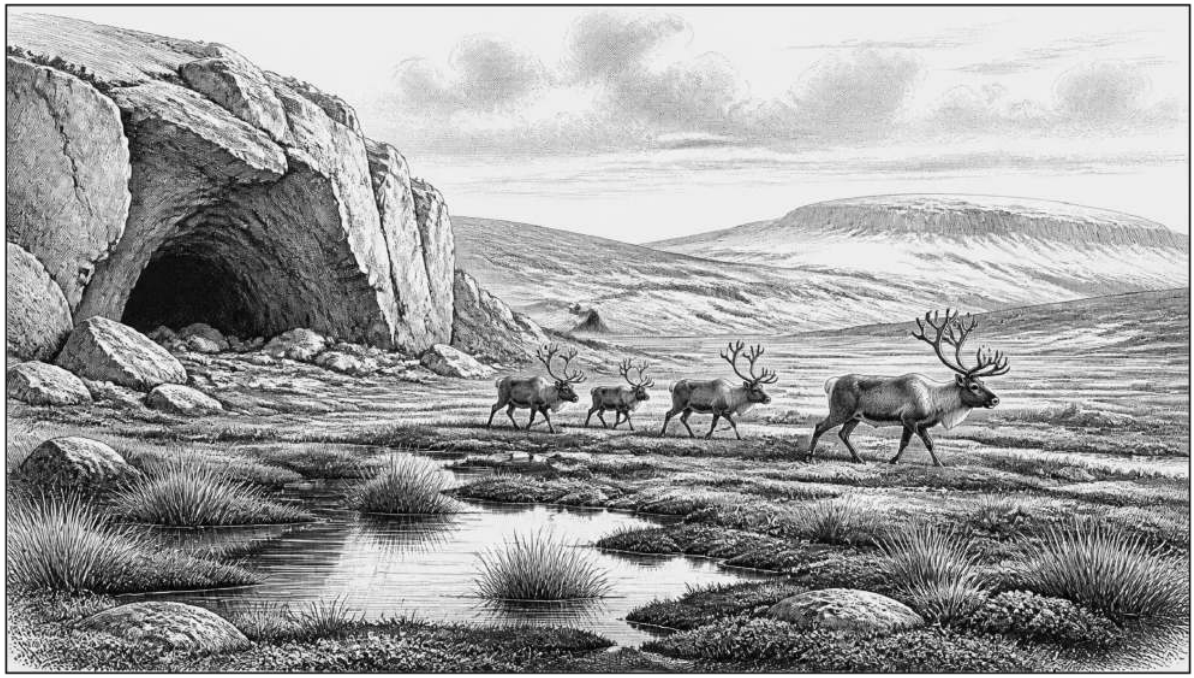
If people did reach Ireland in this wider interval, their lifeways were likely to have been highly mobile and dependent on knowledge of animals, weather, water, stone and seasonal terrain. That is an inference from Upper Palaeolithic lifeways elsewhere in north-west Europe, not direct evidence from an Irish camp. It cannot tell us what language was spoken, how people organised kinship, whether they returned repeatedly, or what beliefs accompanied the handling of a reindeer carcass. The evidence supports a possible brief human act, not a recovered society.

The most important development around this notional year was environmental: Ireland stood in a volatile pre-maximum Ice Age world. At Derryvree, cold open wetlands and pools existed between episodes of glaciation. At Castlepook, animals including reindeer and spotted hyaena left bones in a limestone cave, while one reindeer bone poses a still-unsettled question about human action. Those fragments are slight, but they transform the subject. Rather than a blank before later settlement, Ireland at this depth of time was a changing northern landscape, intermittently habitable for plants and animals, and perhaps briefly visited by people whose wider story has not survived.

Chapter 033 of 100

31268 BCE

Mammoth Cave’s Reindeer Mark [33]



The label 31,268 BCE offers a useful point of orientation, but it cannot identify a known day, season, event or community in Ireland. For this depth of time, modern calendar-year precision is unavailable. The date corresponds only approximately to 33,200 years before AD 1950, and the evidence comes from radiocarbon determinations, sediment layers and fossil assemblages whose calibrated ranges commonly span centuries or millennia. The responsible history of Ireland at this point is therefore a history of environments and probabilities, not a chronicle of named people or dated happenings.

Broadly, this was the later part of the Pleistocene, within Marine Isotope Stage 3, a long and climatically unsettled segment of the last glacial cycle. Ireland was not yet in the Last Glacial Maximum, when the British–Irish Ice Sheet later covered much of the island. Yet neither was it a stable, mild landscape. Cold phases and relatively less severe intervals repeatedly altered the reach of ice, the spread of vegetation, the routes open to animals and the likelihood that people could visit.

A Date Measured in Ranges

Radiocarbon ages are not calendar dates straight from the ground. The amount of radioactive carbon surviving in an organic sample must be calibrated against independently dated environmental records, because atmospheric radiocarbon has varied through time. The further back one goes, the wider the probable calendar range may become. Moreover, a dated animal bone tells us when the animal lived and died, not necessarily the precise moment at which its bones were deposited, moved by water, gnawed by a carnivore or, if applicable, cut by a person.

This is especially important in Ireland, where later ice movement, erosion and changing sea levels have destroyed or obscured many old land surfaces. Caves, buried sediments and museum collections are unusually valuable precisely because they can preserve small remnants of a much larger vanished world. They also demand caution. Some Irish cave collections were excavated in the late nineteenth and early twentieth centuries, before modern recording standards. Individual fossils can be securely identified and redated, but their original associations within a cave are sometimes difficult to reconstruct.

Water Between the Tills

The best directly relevant environmental evidence is not in Cork but at Derryvree near Maguiresbridge in County Fermanagh. There, road works exposed organic freshwater silts and sands enclosed between separate sheets of glacial till. The deposit is known as a Middle Midlandian freshwater series: ‘Midlandian’ is the Irish regional name for the last glacial period. Its organic material produced a conventional radiocarbon age of 30,500 ± 1,100 radiocarbon years BP, calibrated in later syntheses to a broad range of about 36,900–31,700 calendar years BP.

That range includes the approximate chronological position represented by 31,268 BCE. It does not mean that the Derryvree deposit records that individual year. Rather, it demonstrates that, during part of this long interval, north-central Ireland possessed ice-free ground with freshwater habitats between episodes of glaciation. Plant remains, pollen, mosses and invertebrate evidence point to cold, open and wet terrain rather than woodland. Bogbean, an aquatic plant whose distinctive seeds preserve well, is among the notable finds. The wider flora included plants able to endure short growing seasons, exposed ground and severe winter conditions.

Derryvree therefore corrects the tempting picture of an Ireland continuously smothered by ice throughout the Ice Age. There were pools, marshy margins, mineral-rich silts, flowing or standing water and low vegetation. Such environments could support insects, small mammals and grazing animals, even though they were far removed from the later forested island familiar from historical times. Their survival was precarious: a change in snowfall, summer warmth or ice flow could transform a wetland into a glacially overridden landscape.

An Island in Transition

Regional evidence shows that the growth of the last Irish ice sheet was neither instantaneous nor uniform. Studies of Derryvree and nearby Greenagho indicate ice-free conditions in parts of Fermanagh before roughly 34,000 calendar years ago. Marine shells and sediments around Donegal Bay show that western waters and ice margins also changed repeatedly over a far longer interval. At about this notional date, it is safest to envisage a patchwork of exposed country, local or regional ice and shifting coastal or marine conditions, rather than a single island-wide climate.

Southern Ireland had its own history. Deposits along the south coast formed during Marine Isotope Stages 4–3, before the later maximum expansion of ice. Ice-sheet reconstructions place the major build-up after roughly 35,000–32,000 years ago, with maximum extent substantially later, principally between about 27,000 and 21,000 years ago. Thus 31,268 BCE belongs to a threshold in the long approach towards greater glaciation, not to the height of the Last Glacial Maximum.

It would be unwise to map modern shorelines onto this setting. Lower global sea level altered the form of surrounding seas, while ice and crustal movements affected relative sea level locally. The evidence does not allow a simple claim that people or animals crossed a particular land bridge into Ireland

at this time. Any movement between Ireland, Britain and continental north-west Europe depended on changing water barriers, ice, exposed terrain and weather, all of which varied through the glacial cycle.

The Cave Evidence at Castlepook

Castlepook Cave, near Doneraile in north County Cork, is the most evocative Irish site for this period. Also called Mammoth Cave, it was excavated chiefly between 1904 and 1913 under the direction of the naturalist Richard J. Ussher and his collaborators. Its collections include remains attributed to a cold-stage fauna: woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, lemmings and spotted hyaena. The assemblage is not a snapshot. Bones accumulated across different episodes, and later re-dating has shown that older radiocarbon measurements could substantially underestimate the true ages of some specimens.

Modern ultrafiltration and redating of Castlepook material have nevertheless established that important elements of the southern Irish fauna belong to MIS 3. This supports the conclusion that, at favourable times within this cold and variable period, southern Ireland could sustain a diverse animal community. Reindeer imply open country and seasonal grazing opportunities; lemmings and Arctic foxes reinforce the picture of rigorous climates; mammoths and giant deer show that large herbivores could reach, or persist within, Irish landscapes. Spotted hyaena remains also remind us that a cave may have been a carnivore refuge or den, not merely a passive storehouse of animal bones.

A reindeer femur from Castlepook has transformed the discussion. It has been publicly identified as bearing a deep mark interpreted by palaeozoologist Ruth Carden as a stone-tool cut made during the processing of a fresh carcass, and it has been presented as dating to about 33,000 years ago, broadly close to the date considered here. If that interpretation is sustained by continued specialist study, it would be Ireland’s earliest presently claimed evidence of human activity, extending the record far beyond the securely established terminal Palaeolithic traces known from County Clare.

But the limits of this evidence matter as much as its promise. A single marked bone is not a village, a camp, a burial or a population. It does not establish whether one or more visitors killed the reindeer, scavenged it, transported part of it, or encountered an already dead animal. No securely associated hearth, stone-tool assemblage, dwelling surface, human remains or repeated butchery floor of comparable age has yet been recovered at Castlepook. The 2022 excavation located surviving cave deposits but found no cultural artefacts. The femur offers a serious question about human presence, not a completed account of settlement.

Life, Society and What Cannot Be Known

If people did handle a reindeer in Ireland around this time, they were almost certainly highly mobile hunter-gatherers operating in a wider Upper Palaeolithic world. In Britain and continental Europe, such communities used stone tools and animal materials, made clothing and shelters, and maintained connections over considerable distances. Reindeer could yield meat, marrow, hide, sinew, antler and bone. These comparisons help explain why a carcass might have mattered. They cannot demonstrate that an Irish group possessed a particular tool-kit, language, artistic tradition or route of travel.

There is no evidence from Ireland at this date for political institutions, chiefs, territorial states, diplomacy, warfare, formal trade networks, agriculture, permanent settlements, monuments, graves, temples, visual art or writing. It would be misleading to invent them merely because comparable

phenomena are known elsewhere or at much later dates. Nor can a bone mark reveal family structure, gender roles, belief or ritual. The proper archaeological conclusion is simpler and more remarkable: a cold but living Irish landscape may have been entered, at least briefly, by people during the Upper Palaeolithic.

For the rest, the strongest evidence concerns ecology. Fermanagh’s freshwater sediments show that plants and wetland life survived between ice advances. Castlepook’s fossils show that large mammals and predators formed part of a changing southern fauna. Ice-sheet research shows that the land was approaching a later phase of greater glaciation. Together, these archives make 31,268 BCE less an empty blank than a carefully bounded frontier: an Ireland of tundra-like wetlands, limestone caves, mobile herds and unstable ice margins, in which the possible human trace remains no larger than a single incision on a reindeer bone.

Chapter 034 of 100

31267 BCE

Derryvree’s Moss Macrofossils [34]



The label 31,267 BCE supplies a point on a modern chronological grid, not an anniversary from which an Irish narrative can be recovered. At this depth of time, archaeology cannot identify a political event, a named person, a battle, a migration or a particular day. It cannot even securely describe a single year’s weather. In calendar terms the date lies about 33,200 years before AD 1950, the conventional reference point for “BP” dates. It belongs to the later part of the Last Glacial Period, within Marine Isotope Stage 3 (MIS 3), a long and climatically changeable interval before the Last Glacial Maximum.

The responsible subject is therefore an environmental and archaeological horizon rather than a year-by-year chronicle. The best evidence close to this notional date comes from two very different Irish archives: freshwater deposits at Derryvree near Maguiresbridge, County Fermanagh, and the Ice Age bone assemblage from Castlepook Cave in the Awbeg Valley of north County Cork. Together they show that parts of Ireland could support cold-adapted plants and animals before the later expansion of the British–Irish Ice Sheet. They do not prove that the whole island looked alike, nor do they establish permanent human settlement.

A Date Within a Broad Range

Radiocarbon dates are not calendar dates. A measurement records the remaining carbon-14 in a sample and is expressed in radiocarbon years BP; it must then be calibrated against independently constructed curves because atmospheric carbon-14 has varied through time. At around 30,000 radiocarbon years BP, calibration commonly produces wide and sometimes uneven probability ranges. This limits

precision honestly rather than imperfectly. The Derryvree organic deposit produced determination BIRM-166, conventionally dated to 30,500 with an uncertainty of roughly 1,100 radiocarbon years BP. Modern calibration places its age broadly within approximately 36,900–31,700 calibrated years BP.

Thus 31,267 BCE falls within the wide chronological window to which Derryvree is relevant; it is not the date of a particular seed falling into a pool, an animal drinking there, or an episode of human activity. The range is a valuable corrective to the false exactness invited by a numbered BCE year. It places the site in a cold, pre-maximum phase of the last glaciation, when conditions shifted markedly over centuries and millennia. Ireland’s later ice cover erased or disturbed much evidence of this kind, making a protected organic layer beneath glacial sediment especially significant.

Freshwater Beneath the Drumlin

Road construction in 1969 cut through a drumlin at Derryvree, north-east of Maguiresbridge. The exposed sequence contained freshwater silts and fine sands, including organic material, enclosed between two deposits of till: unsorted debris laid down by moving glacier ice. That order of layers provides the central fact. An earlier glacial episode affected the locality; a subsequent interval allowed water, sediment, plants and small animals to accumulate; later ice advanced and sealed the record under another till.

This was not a familiar Irish bog or woodland. Pollen was poorly preserved, but plant macrofossils, mosses and insects supplied a more detailed picture. The assemblage included sedges, grasses and herbs, alongside cold-adapted plants such as mountain avens, dwarf willow and bogbean. Their presence is evidence for suitable habitats around the deposit, especially damp ground and open freshwater margins. It is not a complete list of every plant in Fermanagh, and a few grains of tree pollen cannot demonstrate nearby forest: pollen can travel long distances. The balance of evidence supports open, treeless tundra or muskeg-like country shaped by periglacial conditions, severe winter cold and seasonal thaw.

Such a landscape need not have been a blank expanse of snow. The word “tundra” includes variation. Around shallow pools, sluggish channels and wet hollows, mosses and emergent plants could flourish during a short growing season. More exposed ground may have carried sparse herbaceous cover and low shrubs. Frost action, waterlogging and wind restricted soils and vegetation. Derryvree therefore records an Ireland that was biologically active but austere: an environment with local resources for insects, small animals and grazing mammals, not a temperate, forested island.

The Castlepook Animal Archive

At the opposite end of the island, Castlepook Cave near Doneraile preserves Ireland’s richest known assemblage of vertebrate remains from the period leading towards the Last Glacial Maximum. Also called Mammoth Cave, it is a maze of limestone passages and chambers in the Awbeg Valley below the Ballyhoura Hills. Early twentieth-century excavations recovered more than 2,000 bones. Later radiocarbon work showed that individual specimens span a very long interval, approximately 45,700 to 19,950 BP. Castlepook is consequently not a frozen scene from one generation or even one climatic phase.

Its fauna nevertheless establishes that Ireland was intermittently reached by a striking range of cold-stage mammals. The cave has produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared and Norwegian lemmings, and spotted hyaena. These animals did not necessarily occupy the same patch of ground at the same time. Their bones could

have arrived through several processes: an animal might have died close to an entrance, a predator or scavenger might have carried in part of a carcass, water might have shifted material, and early excavation methods removed much of the contextual detail now expected.

That caution matters particularly for the hyaena. Castlepook is Ireland’s principal evidence for spotted hyaena during the last cold stage. Hyaenas can accumulate bones in dens and modify them while feeding, so their presence offers both ecological information and a warning about interpretation. Mammoth remains need not mean a mammoth died in the chamber; reindeer bones do not map a herd’s exact route. Yet the overall archive strongly indicates that southern Ireland, at intervals during MIS 3, formed part of a wider north-west European zone of open-country animal movement. Large herbivores required forage, while wolves and hyaenas occupied predator and scavenger roles within a complex food web.

People: A Serious but Unsettled Question

The human question at Castlepook is important precisely because the evidence is so slight. A reindeer femur in the historic collection has been reported as bearing a deep mark consistent with cutting or chopping by a sharp stone implement while the bone was fresh. The associated animal bone has been described as about 33,000 years old, making the find broadly relevant to the period represented by 31,267 BCE. If the mark is confirmed as anthropogenic, it would be remarkably early evidence that people handled a reindeer carcass in Ireland before the Last Glacial Maximum.

But a modified bone is not a campsite. It does not disclose the number, identity, language, kinship system or duration of stay of any people involved. It cannot demonstrate a settled population, a regular hunting territory, boats, a land crossing, or an unbroken ancestry to later inhabitants. The bone was recovered from a complex cave archive investigated long before present-day recording standards, and the interpretation of a surface mark is separate from the radiocarbon date of the bone itself. Natural damage, carnivore activity and post-depositional alteration must always be excluded through detailed taphonomic study.

Accordingly, the strongest wording is conditional: Castlepook provides a plausible and consequential indication of very early human contact with an Irish animal carcass, not secure proof of an established Palaeolithic community. The best securely dated published evidence for human activity in Ireland remains much later: cut marks on a brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to the terminal Pleistocene, around 12,800–12,600 calibrated BP. New work in previously unexcavated parts of Castlepook offers the possibility of testing the older evidence in properly stratified deposits.

No Polities, No Proven Trade

Nothing currently supports a discussion of Irish government, diplomacy, warfare, religion, formal learning, trade networks or monuments at this date. There were no known kingdoms, farms, villages, graves, shrines, metal objects, writing systems or built ceremonial sites in Ireland around this horizon. To supply them would convert later prehistoric patterns into fiction. Even the presence of humans remains uncertain. If brief visits did occur, they would most plausibly have involved highly mobile hunter-gatherers equipped with perishable gear and stone tools, but that is an inference from wider Upper Palaeolithic Europe, not a demonstrated Irish social record.

Nor can fossils alone settle how animals, or people if present, moved to Ireland. Lower global sea levels altered coastlines, while ice and sea conditions changed repeatedly, but a simple continuous land bridge from Ireland to Britain or continental Europe should not be assumed. The cave fauna proves that

movements happened during suitable intervals. It does not reconstruct every route, season or crossing. The same distinction applies to economy: reindeer, mammoth and giant deer are evidence of animal communities and potential resources; they are not direct proof that people hunted each species in Ireland.

A Landscape Before the Great Expansion

By the time of the Last Glacial Maximum, after roughly 26,000 calibrated years BP, the British–Irish Ice Sheet became much more extensive and the preservation of earlier landscapes was drastically reduced. Research on Irish and offshore ice-sheet chronology places major later advances well after the Derryvree window, although the timing and geometry of ice growth varied by region. The interval represented by Derryvree is therefore a reminder that “Ice Age Ireland” was not one uniform state. There were episodes of local ice, ice-free ground, cold wetlands, shifting coastlines and changing ecological opportunities.

The enduring importance of 31,267 BCE lies in that correction. Derryvree’s mosses, seeds and freshwater silts show an open northern landscape capable of sustaining specialised life. Castlepook’s bones show that large mammals and formidable carnivores reached southern Ireland across a longer sequence of cold-stage episodes. A single marked reindeer bone raises, but does not resolve, the possibility of a human presence far earlier than once thought. This is not a year of kings or recorded deeds. It is an archaeological threshold: a cautiously reconstructed Ireland of frost, pools, sedges, migrating animals and tantalisingly incomplete human evidence.

Chapter 035 of 100

31266 BCE

Maguirebridge’s Silt Lens [35]



“31,266 BCE” is a modern calendar label, not a date that can be recovered from Irish deposits with year-by-year precision. No event, person, settlement or political act can responsibly be assigned to that particular year. The useful historical frame is the later part of Marine Isotope Stage 3 (MIS 3), within the Midlandian cold stage of the Irish Pleistocene. In calendar terms, the label falls roughly 33,215 years before the radiocarbon reference year of AD 1950, but such arithmetic must not be mistaken for an archaeological date. The relevant evidence is measured in broad calibrated ranges, sediment sequences and changing animal communities.

The closest and most informative Irish record is at Derryvree, near Maguiresbridge in County Fermanagh. There, roadworks in 1969 cut through a drumlin and exposed freshwater silts and sands containing organic remains between two separate tills: unsorted debris deposited by glacier ice. The order of events is clear even if its calendar precision is not. Ice laid down the lower till; later, water and vegetation accumulated sediments in an ice-free locality; eventually another advance of ice sealed the deposits under upper till. A radiocarbon determination from the organic material, Birm-166, was reported as 30,500 ± 1,170/1,030 radiocarbon years BP. Modern calibration places it broadly around 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The requested year lies within that very wide interval, not at an identifiable moment within the bed.

An Island in a Changing Cold Stage

This was not yet the Last Glacial Maximum, when ice later became far more extensive across Ireland and the surrounding seas. Nor was it a mild, stable prelude to it. MIS 3 was characterised across the North Atlantic world by sharp climatic shifts, registered especially clearly in Greenland ice cores. Irish deposits cannot be matched securely to a single short-lived Greenland warming or cooling episode merely because

their broad dates overlap. What the Fermanagh sequence establishes is more limited, and more valuable: at some point within its dated span, ground near Maguiresbridge was not beneath glacier ice and supported a freshwater environment in a severe periglacial climate.

That distinction matters for Ireland as a whole. Derryvree is firm evidence for local conditions in south Fermanagh, not proof that every coast, mountain and lowland was simultaneously ice-free. Glaciers respond to local topography, snowfall, temperature and the dynamics of neighbouring ice masses. Other evidence from Ireland, including marine shells and glacial deposits, suggests that the last Irish Ice Sheet expanded over a long interval rather than appearing everywhere at once. Around the time represented by this article, some landscapes could have been open, wind-exposed and biologically productive while other regions were affected by advancing ice or lay beyond the available evidence.

The familiar outlines of the modern island were also misleading guides to movement. Sea level was considerably lower than today because large volumes of water were locked in continental ice sheets. Coastlines lay farther out, and the Irish Sea basin had a different geography. Yet no securely demonstrated land route, sea crossing or seasonal passage can be assigned to a particular year around 31,266 BCE. The presence of mammals shows that animals reached Ireland during favourable parts of the wider cold-stage interval; it does not reveal every route, every generation or the exact shape of the shore.

Freshwater Among the Tundra

Derryvree’s organic horizon is a rare environmental archive. Plant macrofossils, pollen, mosses, sedges and fossil insects preserve a picture of cold, largely treeless country. The vegetation was not woodland. It was an open mosaic of wet ground, shallow water, sedge-rich margins and sparsely vegetated mineral soils, shaped by frost, short growing seasons and strong seasonality. The recovery of aquatic and wetland plants, including bogbean, shows that liquid water persisted during the warmer part of the year. Mosses and herbs associated with northern or alpine environments indicate conditions far colder than those of modern Fermanagh.

Such evidence is direct evidence for particular organisms and habitats, but reconstruction requires care. A pollen grain can travel; an insect or plant remains only where sedimentation and preservation allow it to survive; a buried pool tells us little about an upland ridge a few kilometres away. Still, the combined record strongly supports a tundra-like, periglacial setting rather than a forested Irish landscape. In places, seasonally frozen ground would have affected drainage and vegetation. Pools and sedge marshes could have been biologically rich in summer, while winter imposed darkness, cold and restricted plant growth.

There is no basis for imagining farms, fields, villages or a managed countryside. There was no agriculture in Ireland at this depth of time, no domesticated livestock, no pottery, metalworking or written learning. What can be discussed instead is an ecosystem in which the annual productivity of grasses, herbs, mosses and wetland plants sustained mobile animal populations. The principal history is therefore environmental: water collecting between glacial episodes, plants recolonising exposed ground, animals moving through available habitat, and ice eventually returning to transform or destroy that landscape.

Castlepook and the Mammal Record

County Cork provides another essential, though differently preserved, window. Castlepook Cave near Doneraile, historically called Mammoth Cave, has yielded Ireland’s richest known assemblage of vertebrate remains from the period leading towards the Last Glacial Maximum. Excavations in the early

twentieth century recovered more than 2,000 bones from cave sediments. Subsequent direct radiocarbon dating has shown that its fauna represents a long span, broadly from about 45,700 to 19,950 years BP. It is therefore not a snapshot of one living community, still less of a single year, but a repository assembled over millennia by natural processes as well as animal activity.

Its fauna demonstrates that, during parts of MIS 3, Ireland supported mammals now absent from the island: woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, alongside wolf, Arctic fox and lemmings in later cold-stage deposits. A cave containing bones does not necessarily mark a hunting camp. Carnivores may have carried prey into chambers; scavengers, water, sediment movement and repeated disturbance can mix material of different ages. At Castlepook, the presence of spotted hyena is especially significant, because hyenas can accumulate bones and alter them through gnawing and transport. Their denning behaviour is part of the explanation for the assemblage, not an inconvenience to be ignored.

For the date in question, reindeer are particularly evocative but should not be romanticised. Their bones show that cold-adapted deer occurred in Ireland during this broad era and that open country could support grazing or browsing herds. They do not demonstrate a permanent annual migration route through every Irish region. Mammoth and giant deer similarly belong to a changing fauna rather than to a guaranteed cast of animals visible together at Maguiresbridge in 31,266 BCE. The sound conclusion is that Irish landscapes were capable, at intervals, of sustaining a much richer Pleistocene mammal community than survives today.

The Human Question

A reindeer femur from Castlepook has been publicised as bearing a deep mark consistent with cutting or butchery using a stone tool, and the bone has been dated to roughly 33,000 years ago. If that interpretation is sustained, it may be Ireland’s earliest evidence of human handling of an animal and would push possible human activity far earlier than the well-known post-glacial evidence. It is an important claim, but it remains necessarily narrow. A radiocarbon determination dates the animal bone, while deciding whether an incision was made by a tool rather than another process is a separate taphonomic judgement.

Crucially, no securely associated stone-tool assemblage, hearth, dwelling floor, burial, repeated occupation surface or food-processing area of comparable age has been recovered at Castlepook. One marked bone cannot establish a resident population, a language, ancestry, a route of arrival or continuous occupation of Ireland. It cannot support invented hunters around a campfire, however tempting such a scene may be. Recent work at the cave is valuable precisely because new excavation and modern scientific techniques may test the old collections and their disturbed contexts more rigorously.

Accordingly, there are no political affairs, diplomacy, named communities or conflicts that can be responsibly narrated for Ireland in this year. If people did reach the island during this part of MIS 3, they would have been mobile Upper Palaeolithic hunter-gatherers operating at the north-western edge of Europe. Their social relations, beliefs, speech, exchange networks and artistic practices are unknown in an Irish context. Continental European evidence shows that such populations possessed sophisticated stone technologies and rich cultural lives, but transferring those details to Ireland without Irish finds would be speculation.

What This Date Can Mean

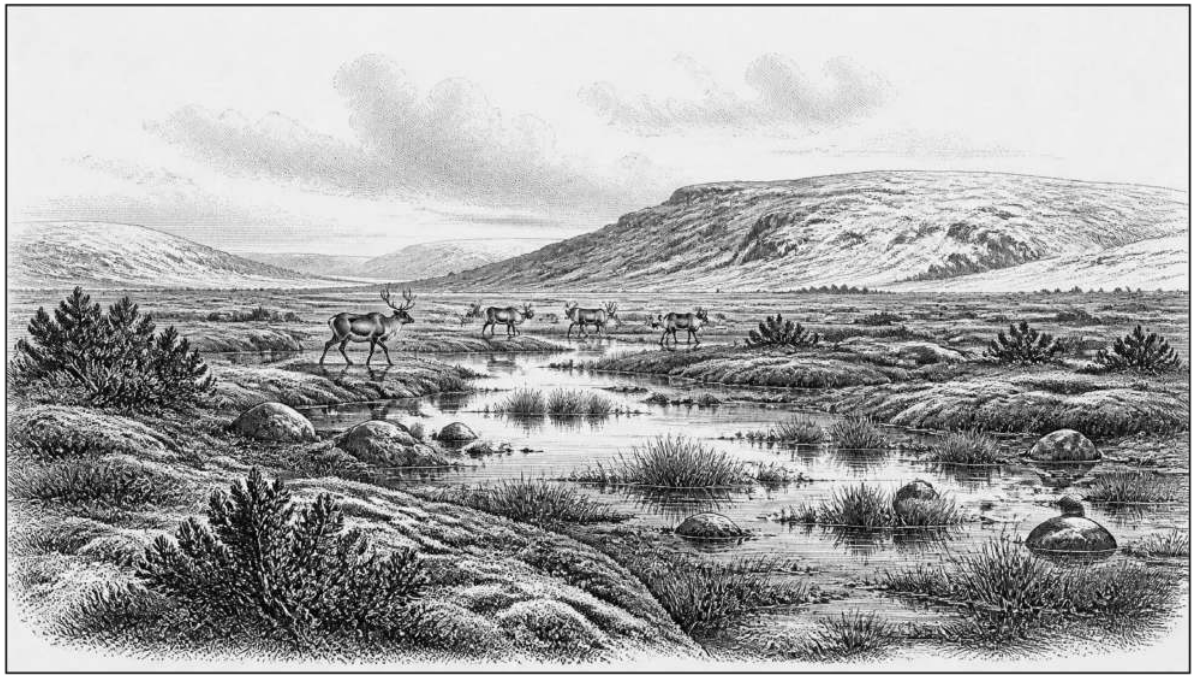
The most historically meaningful development around this notional date was the unstable availability of habitable ground. Fermanagh's buried freshwater deposits show that an ice-free interval allowed a cold wetland ecosystem to exist between glacial advances. Castlepook's bones show that large mammals, carnivores and cold-adapted species entered Irish environments during the broader period. Together, the sites challenge any simple picture of an Ireland either wholly frozen or continuously inhabited. They reveal a landscape repeatedly opened and closed by climate: a place of tundra pools, sparse vegetation, animal movement and encroaching ice.

That is both a substantial history and the limit of the evidence. Ireland around 31,266 BCE was not a blank before later human settlement, but neither can it be populated with invented tribes, rulers or events. The surviving record is geological and biological, preserved by chance beneath drumlins and in limestone caves. Its restraint is its strength: silts, mosses, insects and bones allow us to see an island undergoing profound environmental change long before historical time.

Chapter 036 of 100

31265 BCE

Derryvree Before the Till [36]



The label 31,265 BCE is useful only as a modern point on a very long prehistoric timescale. It does not denote a year that anyone in Ireland recorded, named or could have recognised. At this depth in time, archaeology cannot isolate a particular winter, hunt, journey or political act to a calendar year. In the conventional system that counts backwards from AD 1950, it corresponds roughly to 33,214 years before present. The responsible setting is therefore a broad interval in the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), rather than an annual chronicle.

Ireland at this notional date was not yet the familiar island of later prehistory, with farms, monuments, territorial communities and sea routes known from archaeology. It was a changing northern landscape in the last Ice Age. Its evidence survives unevenly: in silts sealed beneath glacial deposits, pollen and plant remains, insects, cave bones, and the shapes left by later ice. These sources illuminate environment and animal life far better than human institutions. They require a distinction throughout between what has been found and what may reasonably be inferred.

A Date Within a Range

The closest important Irish chronological anchor is the Derryvree sequence near Maguiresbridge in County Fermanagh. Roadworks exposed organic-rich freshwater silts and fine sands caught between two tills, the unsorted sediments laid down by glacier ice. The order is decisive evidence: ice had occupied the site; a period without local glacier cover then allowed water, plants and sediment to accumulate; and a later advance sealed the deposit beneath another till. It is a record of profound environmental change, not a layer belonging to one named year.

Organic material from Derryvree produced a radiocarbon age of 30,500 ± 1,200 radiocarbon years BP. When calibrated, this has been placed broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The date 31,265 BCE lies within that wide span, but it cannot be assigned to a particular part of the deposit. Radiocarbon ages must be converted through calibration curves because atmospheric carbon-14 has changed over time; at more than 30,000 years ago, the resulting calendar ranges are necessarily broad.

That limitation is not a failure of the evidence. It defines what good history can say. Derryvree can responsibly illuminate a cold phase of Ireland’s Late Pleistocene, while it cannot establish that a particular pool, plant, animal or person existed there in 31,265 BCE. Nor should its local history be projected unaltered across the entire landmass now called Ireland.

Wet Ground in Cold Country

The Derryvree fossils point to open, treeless country rather than forest. Grasses, sedges, herbs, juniper and mosses, together with insect evidence, indicate a tundra or muskeg environment: wet, peaty ground with shallow open pools, plant-rich margins and extensive frost-affected terrain. A fossil seed of bogbean, a plant of wet places, is particularly vivid evidence for freshwater habitats amid the cold. The climate was harsh, with long cold winters, but the deposits show that this locality was not continuously entombed beneath glacier ice while the sediments formed.

This was a periglacial world. Seasonal freezing and thawing would have disturbed soils, moved sediment and limited woody vegetation. In warmer months, however brief, wet hollows and stream margins could support a productive mosaic of grasses, sedges, mosses and flowering herbs. Such ground was neither empty nor uniform. It offered forage to grazing animals, cover to smaller mammals and insects, and freshwater to anything moving through the landscape. Yet its productivity must not be confused with comfort: exposure, wind, frost and rapidly shifting seasonal conditions governed daily survival.

The wider glacial picture remains regionally complex. Geological reconstructions suggest that north-central Ireland had remained ice-free until at least about 34,000 years ago, before the last Irish Ice Sheet expanded. At around the broad horizon represented by this article, ice was beginning to become a more important force in the region, but neither the exact margin nor the timing of advance can be fixed everywhere. Later growth was substantial: reconstructions show the British–Irish Ice Sheet building from 31,000 to 26,000 years ago and reaching maximum volume around 23,000 years ago.

Animals and Cave Archives

Irish cave deposits supply the strongest evidence for the animals able to live in, or reach, this cold landscape. Castlepook Cave near Doneraile in north County Cork, long also known as Mammoth Cave, has produced remains attributed to woolly mammoth, reindeer, spotted hyaena and other Pleistocene fauna. Earlier dating work identified mammoth and hyaena remains of roughly the relevant age range. Such assemblages demonstrate that Ireland was accessible to a changing suite of large mammals before the fullest glaciation, although cave collections are often old, incomplete and disturbed by water, carnivores or later excavation.

Reindeer were especially suited to open ground and, alongside mammoth, evoke an ecosystem in which grazing and browsing animals could range across broad, sparsely wooded terrain. Spotted hyaenas indicate predators and scavengers capable of moving bones into caves; a cave assemblage is therefore not

automatically a picture of animals living together at one moment. It may instead be an accumulation made across generations or millennia. The Irish Quaternary Fauna Project stressed both the remarkable range of mammals present before the Last Glacial Maximum and the severe limits imposed by sparse, reworked evidence.

The Castlepook Human Question

One object makes this period exceptionally important for Irish archaeology: a reindeer femur from Castlepook Cave, publicly reported as about 33,000 years old and bearing a deep mark interpreted by palaeozoologist Ruth Carden as a stone-tool cut or chopping mark. If that interpretation is confirmed, it is evidence that a person processed a reindeer in Ireland during the Upper Palaeolithic, much earlier than the long-established record of post-glacial settlement. County Cork's heritage publication identifies the bone as a Palaeolithic reindeer femur from Castlepook and dates it broadly to c. 31,000 BC.

Its importance should not be inflated into a story the evidence cannot bear. The bone's date is the age of the animal, not a precisely dated moment of butchery. It came from an antiquarian cave collection, not a modern, fully stratified excavation with a securely associated hearth, tool-kit, dwelling surface or human remains. No contemporaneous settlement has yet been demonstrated at Castlepook. Carnivores may have transported discarded bone into the cave, and neither one cut-marked specimen nor one cave can establish the scale, duration or regularity of human presence.

The most cautious conclusion is also the most consequential: the femur may document a fleeting episode of human activity in Ireland around this wider period. It does not prove a permanent population, a village, a named people or a continuous ancestry leading to later inhabitants. Ongoing work at Castlepook seeks undisturbed deposits and further evidence such as lithics, charcoal, modified bone or cave art precisely because corroboration is essential for so early and unusual a claim.

Life Without Institutions

There is no evidence from 31,265 BCE for Irish political affairs, diplomacy, formal leadership, warfare, law or territorial states. There are no inscriptions, monuments, settlements or graves from which to reconstruct religion, language, kinship rules or social rank. It would be misleading to invent them. If people did reach Ireland, they would most plausibly have travelled in small, highly mobile hunter-gatherer groups, as part of wider north-west European movements following seasonal resources. That is an interpretation drawn from the possible butchery evidence, the reindeer ecology and the known character of Upper Palaeolithic lifeways elsewhere, not a directly observed Irish social system.

Under that interpretation, everyday work would have centred on movement, shelter, fire, clothing and the acquisition of food in a cold landscape. A reindeer carcass could yield meat, fat, hide, sinew, marrow and bone, but the Castlepook femur cannot reveal which of these mattered, whether hunters killed the animal, or whether they encountered an already dead carcass. No evidence supports farming, stock-keeping, pottery, metalworking, permanent houses, trade goods or long-distance exchange networks within Ireland at this date.

Religion and culture are equally beyond direct recovery. People elsewhere in Upper Palaeolithic Europe made sophisticated tools, ornaments and images, but Ireland has no securely dated artistic tradition, ritual site or learning institution from this horizon. The absence is meaningful chiefly as an

archaeological fact, not proof that visitors lacked beliefs, stories, skills or social customs. Mobile groups leave light traces; subsequent glaciation and later erosion have removed or buried much of what may once have existed.

Routes, Water and Change

How animals and possible people arrived remains uncertain. Lower sea levels altered the surrounding shelves, but this does not license a simple claim that Ireland was joined to Britain by an easy continuous land bridge. Geological scholarship has challenged that older assumption and emphasises changing coastlines, ice, water and short-lived possible connections. The cave fauna confirms that some animals reached Ireland; it does not identify the route, season or conditions of every crossing.

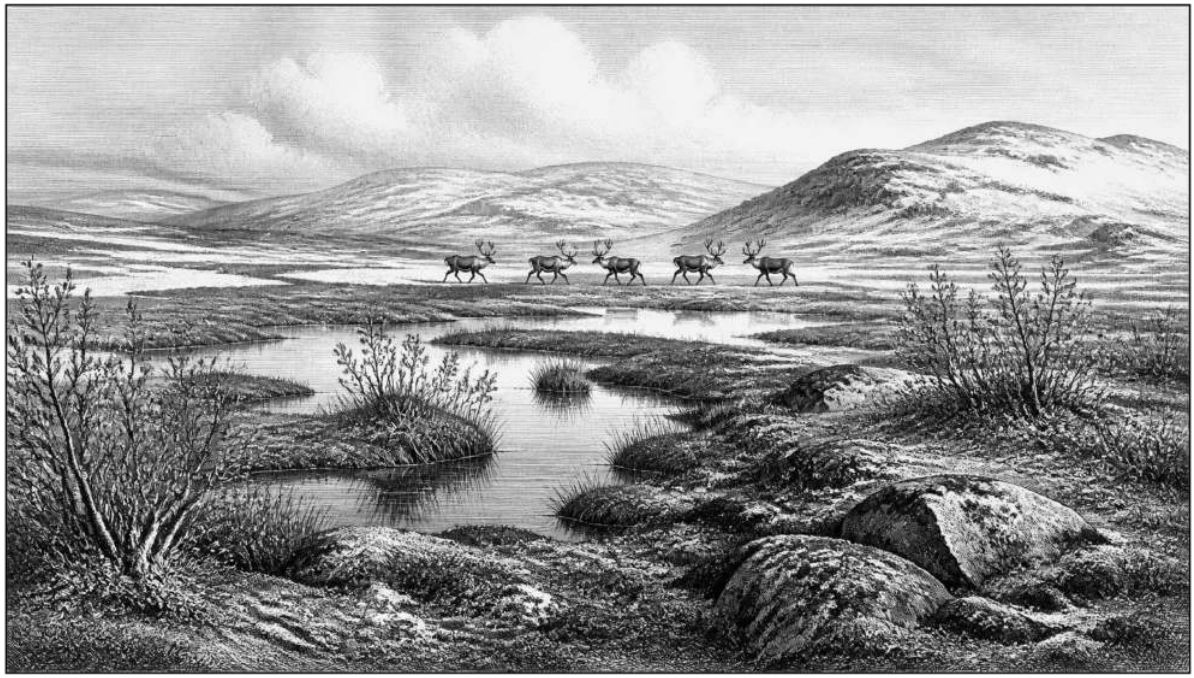
The principal historical development around this notional year was environmental instability. Derryvree preserves a freshwater tundra landscape between glacial episodes. Castlepook preserves evidence of Ice Age animals and a possible human action. Together they show an Ireland that was habitable in places, but vulnerable to the expanding power of ice. Over the following millennia, the last Irish Ice Sheet grew across much of the island, reshaping ground, disrupting habitats and destroying or concealing older archaeological evidence.

Thus 31,265 BCE is not the date of a battle, ruler or foundation. It is a cautiously placed point within a long Pleistocene interval, where sediments beneath a Fermanagh drumlin and a marked reindeer bone in a Cork cave offer rare, tantalising glimpses of Ireland before the greatest advance of the last ice sheet.

Chapter 037 of 100

31264 BCE

Ballyhoura Reindeer Carcass [37]



The label 31,264 BCE is a modern way of locating a point deep in the Ice Age, not a year from which Ireland preserves an event, a ruler or a dated human biography. It falls about 33,214 years before the conventional radiocarbon reference year of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). Archaeology and environmental science cannot resolve conditions in Ireland to one calendar year at this depth. The responsible approach is to use dated ranges, deposits and specimens: evidence that can illuminate a broad interval around the notional date, while keeping clear what remains uncertain.

A Cold-Stage Islandscape

Ireland around this time belonged to the long, unstable cold phase usually called the Midlandian in Irish Quaternary studies. It was not yet the Last Glacial Maximum, when ice expanded much more extensively across and around Ireland after roughly 26,000 years ago. The climate nevertheless oscillated sharply over centuries and millennia. Temperatures, precipitation, sea level, vegetation and the margins of glaciers all changed in response. A single nationwide landscape cannot be reconstructed for 31,264 BCE, because the surviving evidence is sparse, local and often disturbed by later ice, water and quarrying.

There is good reason, however, to reject the picture of an unbroken white wilderness. In parts of Ireland, cold but non-glacial ground supported open vegetation, wetlands and grazing animals. The wider sea floor was exposed much farther than it is now as global sea levels fell, altering coasts and the geography of travel. Yet Britain and Ireland were not thereby simply joined by a dependable dry-land corridor. Any movement of people or animals into Ireland had to negotiate an evolving, cold-water maritime and coastal landscape whose precise routes are not securely known.

Later ice sheets did more than transform the terrain: they removed or buried much of the evidence that might once have recorded camps, tracks, hearths and animal kills. This is one reason why Irish evidence for the Upper Palaeolithic is so meagre compared with that of continental Europe or even Britain. Absence of a site is not proof that no person ever arrived; equally, a small number of finds cannot demonstrate a resident population. The historical record for this period is chiefly a record of what ice-age geology and caves happened to preserve.

Derryvree’s Tundra Wetland

The clearest local environmental archive relevant to this date lies beneath a drumlin at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 exposed organic silts and fine sands trapped between two separate till sheets. The lower till records an earlier advance of ice; the upper till records a later one. Between them lay freshwater sediments made when this part of Fermanagh was ice-free, though emphatically cold.

A legacy radiocarbon determination from the organic deposit, Birm-166, was reported as 30,500 radiocarbon years BP with a large uncertainty. Calibration produces a broad range, commonly expressed as approximately 36,900–31,700 calibrated years BP. That range overlaps the notional date of 31,264 BCE, but it does not allow anyone to claim that the Derryvree wetland was sampled in that precise year. The large range matters: it represents many generations of environmental change, and the reliability of old pre-Last Glacial Maximum radiocarbon measurements is assessed cautiously in more recent ice-sheet chronologies.

What Derryvree does securely contribute is a vivid environmental pattern. Mosses, sedges, herb pollen, plant macrofossils and insects indicate a treeless, periglacial setting. The flora included cold-adapted plants associated with tundra and wet ground, while the insect evidence likewise pointed to northern conditions. Pools and waterlogged patches occurred amid open vegetation rather than dense woodland. Dry ground may have been thinly vegetated and exposed to frost action, while sheltered hollows retained freshwater. This was a productive but seasonal mosaic, not an empty desert.

Derryvree is evidence for south Fermanagh, not a complete map of Ireland. Nevertheless, it establishes an important possibility for the island at this stage of MIS 3: areas beyond active ice could carry wetland plant communities and support animal life. It also gives Irish history a rare ecological baseline. The political map, settlement pattern and social identities of the time are unknown; the rhythm best recovered is that of freezing, thawing, sedge growth, standing water and the passage of animals across open ground.

The Castlepook Faunal Archive

In north Cork, Castlepook Cave near Doneraile provides the complementary archive of animals. Its limestone passages, including galleries historically named Hyenahall and Elephant Hall, yielded more than 2,000 bones during excavations in the early twentieth century. Geological Survey Ireland describes it as Ireland’s richest known site for vertebrate fauna in the period before the Last Glacial Maximum. Radiocarbon dates on individual bones extend across a very long span, from about 45,700 to 19,950 years BP. The cave was therefore a repository used, or entered, repeatedly over thousands of years; it was not a sealed snapshot of one season.

The assemblage includes reindeer, woolly mammoth, giant deer, brown bear and spotted hyaena, alongside later records of wolf, Arctic fox, Norwegian lemming and collared lemming. These animals should not be imagined as standing together at one moment. Several species belong to different portions of the cave’s long chronology, and water disturbance has mixed some deposits. Yet the broadly pre-maximum fauna shows that Ireland could sustain a suite of large grazers, browsers, predators and scavengers in cold open landscapes. A cave could acquire bones from animals dying there, carnivores carrying prey inside, water moving material, and perhaps people.

Reindeer are especially appropriate guides to this setting. They thrive in open, cold environments and can make use of a varied tundra vegetation. Mammoths and giant deer point to substantial forage somewhere in the surrounding region, rather than a uniformly barren landscape. Spotted hyaena is equally important, because it warns against treating every accumulated bone as the result of human hunting. Carnivores are active agents in cave assemblages. Tooth marks, breakage, scavenging and redeposition can all resemble or complicate human signatures.

The Marked Femur

Castlepook has become central to the question of Ireland’s earliest people because a reindeer femur from its old collections bears a deep incision. Zooarchaeologist Ruth Carden has interpreted the mark as one made by a sharp stone tool during carcass processing. Public accounts have described the bone as roughly 33,000 years old, and the discovery prompted renewed investigation of the cave by archaeologists, cavers and specialists supported through the Royal Irish Academy. If the incision is correctly identified as a cut mark and belongs to the same broad age as the bone, it is potentially the earliest evidence that people handled an animal in Ireland.

The appropriate conclusion remains deliberately modest. The femur does not establish a year of arrival, a permanent settlement, a named Upper Palaeolithic culture or descent from these possible visitors to later Irish populations. No securely associated hearth, stone-tool assemblage, built shelter, burial, occupation surface, artwork or human skeletal remains has yet been demonstrated at Castlepook for this period. Nor does an animal-bone date automatically date the making of a mark on that bone. These limitations are not technical quibbles; they determine the difference between evidence for one act of carcass processing and a claim for an inhabited country.

Even so, the conditional human interpretation is historically significant. If a small party butchered reindeer near Castlepook, it possessed a sharp lithic edge and knowledge of how to exploit a large carcass. The meat, fat, marrow, hide, sinew and bone of such an animal could all have mattered to mobile hunter-gatherers in a cold climate. This would suggest a brief foraging visit or perhaps a wider pattern of seasonal movement, but the evidence cannot decide between them. It also cannot tell us whether the animal was hunted, scavenged after a predator kill, or encountered already dead.

Society Beyond Recovery

There is no responsible evidence for political affairs, diplomacy, warfare, leadership, property boundaries or relations between named communities in Ireland around 31,264 BCE. Nor is there evidence for formal religion, ritual monuments, writing, schools or artistic traditions on the island at this date. It would be tempting to borrow richly documented Upper Palaeolithic societies from France, Spain or

central Europe and place them in Ireland; that would be interpretation by analogy, not Irish history. Continental parallels may show what Homo sapiens elsewhere were capable of, but Castlepook's single possible human trace cannot carry that cultural weight.

The same restraint applies to economy and trade. There is no evidence for Irish exchange networks, managed herds, farming or permanent villages. If the femur records human work, the only defensible economic statement is narrow: people may have obtained useful resources from a reindeer carcass. Their tools, origins, language, kinship, clothing and destination remain unknown. The island's most securely documented inhabitants at this point are plants and animals, not people.

Regional contrast is therefore the main story. Fermanagh's inter-till freshwater deposits reveal a tundra wetland preserved below later glacial sediment. North Cork's cave preserves the bones of a changing cold-stage fauna, perhaps including one reindeer processed with a stone edge. Both records show that Ireland was environmentally diverse and intermittently habitable before the full glacial advance. Both also show why historical precision has limits. Around 31,264 BCE, Ireland was a cold, open and changing frontier whose most persuasive witnesses are mud, mosses, insects and bones.

Chapter 038 of 100

31263 BCE

Castlepook’s Cutmark Debate [38]



There can be no responsible account of events in Ireland in a literal calendar year of 31,263 BCE. No written record, settlement sequence or securely dated activity surface permits that precision. The number is a modern chronological label: expressed in the convention of calibrated years before present, it lies roughly 33,200 years before AD 1950. At that depth of time, radiocarbon results carry substantial ranges, and deposits may represent centuries or millennia rather than a single season. What can be reconstructed is a changing Late Pleistocene world in which parts of Ireland supported cold-adapted plants and animals before the Last Glacial Maximum reshaped much of the island.

A Late Pleistocene Horizon

This notional date belongs broadly to Marine Isotope Stage 3 (MIS 3), an unstable climatic interval before the coldest and most extensive phase of the last glaciation. Ireland was not simply a perpetually ice-covered land, nor a familiar temperate island. Ice expanded and contracted, sea level stood far lower than today, and the geography of western Europe differed profoundly. Britain and Ireland were connected or separated by changing lowland and marine corridors according to local ice, sea level and topography. Such reconstructions make movement by animals, and potentially by people, possible in some periods; they do not demonstrate a particular route or crossing in this particular year.

The great Last Glacial Maximum came later. Research on the British–Irish Ice Sheet places major expansion across Ireland and its surrounding shelves principally after this period, with the ice-sheet’s maximum configuration developing during the later part of the last glacial cycle. Earlier cold phases

could nevertheless bring local glaciers, permafrost, severe winters and landscapes stripped of woodland. Evidence from sediments and landforms is therefore essential: later ice eroded, redeposited and buried much of the older ground surface that might otherwise preserve campsites or tracks.

Derryvree’s Wet Ground

The most instructive Irish environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed fine sands, freshwater silts and organic material sealed between two distinct tills. The sequence is important because the lower and upper tills record separate episodes of ice deposition, while the material between them accumulated when this locality was not overridden by glacier ice. It is not a snapshot of all Ireland, and it cannot be fixed to 31,263 BCE. Its conventional radiocarbon determination of 30,500 +1,170/−1,030 BP requires calibration and has a broad calendar-age uncertainty. Yet it securely places a cold, ice-free freshwater environment within the relevant middle part of the last glacial period.

Pollen, plant macrofossils, mosses and insects in the Derryvree deposit point to open, treeless or near-treeless terrain, wet hollows and shallow freshwater. The flora included plants and mosses suited to cold ground, while the wider vegetation was dominated by herbs, grasses and sedges rather than closed forest. The term *muskeg*, used by earlier investigators, evokes waterlogged, peaty, moss-rich ground. “Tundra” is a useful broad comparison, provided it is not imagined as a uniform white wilderness: even a severe periglacial landscape contained contrasting microhabitats of pools, sedge margins, exposed mineral soil, sheltered slopes and patches of low vegetation.

Some pollen grains are difficult to interpret. Pollen can travel far, and older material can be reworked into younger sediments. A trace of pine or hazel pollen is consequently not proof of woodland growing beside the Fermanagh wetland. The stronger conclusion rests on the combined evidence: herb pollen, cold-adapted plant remains, mosses and insects indicate a sparse, northern environment with seasonal liquid water. The Derryvree record therefore gives everyday ecological substance to an otherwise almost invisible period of Irish history.

Animals at Castlepook

County Cork offers the other principal window. Castlepook Cave, near Doneraile in the Awbeg valley, produced a remarkable collection of Late Pleistocene animal remains during excavations led by Richard J. Ussher and colleagues in the early twentieth century. Subsequent study, especially the Irish Quaternary Fauna Project and later re-dating, has shown that some of these bones belong to a much older MIS 3 fauna than earlier radiocarbon work suggested. The assemblage includes remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, collared and Norwegian lemmings, and spotted hyaena.

That list must not be treated as a census of animals standing together in one valley in one year. Cave deposits accumulate through many processes. Carnivores may drag in carcass parts; animals may die in or near caves; water and slopewash can move bone and sediment; and antiquarian excavation often disturbed or removed layers before modern recording standards existed. Direct dates apply to individual specimens, rather than to the entire collection. Even so, the bones establish that Ireland was visited or occupied by a far richer cold-stage fauna than survives on the island today. Reindeer and lemmings fit open, cold conditions; mammoth and giant deer imply extensive forage landscapes; hyaenas and wolves show that large predators also formed part of the food web.

The revised dates matter in a wider sense. Improved collagen pretreatment has made clear that some older bone dates from Irish caves were too young, because later contamination can distort results close to the practical limits of radiocarbon dating. Re-dating at Castlepook, Shandon Cave in County Waterford and Foley Cave in County Cork has pushed several specimens further back into MIS 3. This does not make every early claim secure. Rather, it illustrates why deep Irish prehistory is continually revised as museum collections, laboratory methods and stratigraphic understanding improve.

The Human Question

A reindeer femur from the Castlepook collection is especially provocative. It has been reported as bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone implement during butchery. The bone has been publicised as approximately 33,000 years old, close to the broad horizon represented by 31,263 BCE. If the mark was indeed made by people while the bone was fresh, it would be evidence of human handling of a reindeer in Ireland tens of millennia earlier than the traditionally accepted terminal-Pleistocene evidence.

That conclusion remains an interpretation, not an established narrative of settlement. The dated bone does not supply a camp, hearth, stone-tool assemblage, dwelling, burial, repeated kill site or evidence for a resident population. Nor does it prove that hunters lived in Castlepook Cave. The bone may have been processed elsewhere before being carried or moved into the cave system. The National Museum of Ireland still states that no clear Palaeolithic evidence of humankind in Ireland has emerged, an appropriately cautious position given the fragmentary and disturbed nature of the record. The Castlepook mark deserves further microscopic study, comparison with carnivore and natural damage, and corroboration from securely excavated deposits.

Society Without Institutions

There is no evidence for political communities, chiefs, diplomacy, territorial states or organised warfare in Ireland at this time. There are likewise no Irish data for ritual monuments, formal burials, art, language, teaching institutions, agriculture, permanent villages, pottery, metalwork or trade networks. To invent them would confuse the rich Upper Palaeolithic record of continental Europe with the very limited Irish record. If people entered Ireland during a milder interval, they were most plausibly small, mobile hunter-gatherer groups using perishable equipment and stone tools, perhaps following seasonal animal movements. But this is a model derived from comparable environments, not a fact demonstrated by an Irish campsite of this date.

The practical economy visible in the evidence is instead an ecological one. Large herbivores would have converted sparse vegetation into meat, hides, sinew, fat and bone; predators competed for carcasses; caves could become traps, dens, shelters or sediment traps. A human group capable of processing a reindeer would have needed knowledge of animal behaviour, weather, cutting tools and the risks of cold-country travel. None of that establishes trade or long-term residence. It only defines the skills that a possible short-lived human incursion would have required.

An Island in Formation

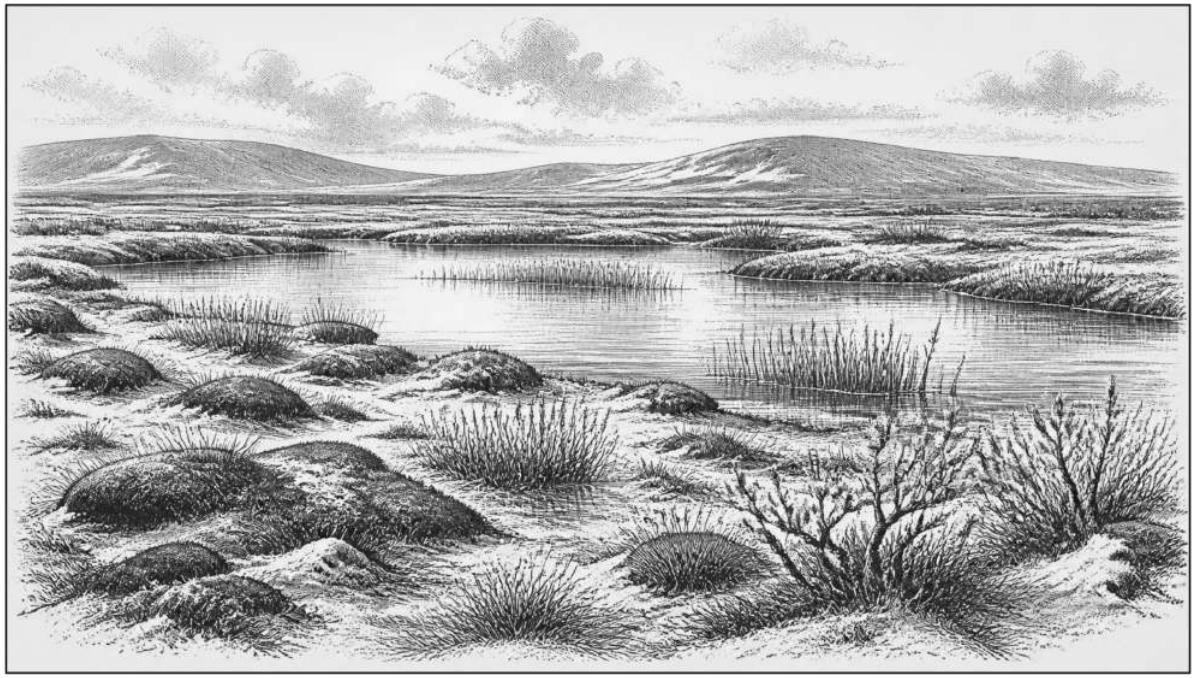
Regional change is the principal story. Fermanagh’s freshwater sediments demonstrate that an ice-free wetland existed between glacial advances. Cork’s cave fauna demonstrates that substantial mammals reached southern Ireland during MIS 3. Together, they rebut the older, over-simple picture of an island sealed beneath uninterrupted ice. They do not, however, show that every region was habitable at once. Conditions were patchy and rapidly changing, shaped by ice margins, frozen ground, drainage, vegetation, season and sea level.

For Ireland around this notional date, the most secure history is therefore environmental. Cold open ground, wetlands and mobile animal populations existed in at least some places; glaciers had not yet imposed their later maximum extent; and one contested reindeer cutmark raises the possibility of a human visit. The future Irish landscape was already being prepared by frost, flowing water, ice and sediment. But the later island of farms, kingdoms, churches and towns remained unimaginably distant.

Chapter 039 of 100

31262 BCE

Derryvree’s Freshwater Silt [39]



“31,262 BCE” is a useful modern filing point, not a year to which Irish prehistory can be dated with calendar precision. It falls roughly 33,211 years before AD 1950, the reference year used for calibrated radiocarbon ages, and belongs to the later part of the Pleistocene, broadly Marine Isotope Stage 3 (MIS 3). For Ireland at this depth of time, the responsible unit of history is not a named year, reign or event, but a wide chronological interval. The evidence consists chiefly of sediments, fossil plants and animals, cave deposits, glacial landforms and laboratory dates, each with margins of error and each requiring interpretation.

The closest important environmental archive is Derryvree near Maguiresbridge, County Fermanagh. Road works in 1969 exposed organic silts and fine sands sealed between two tills in a drumlin: deposits made by separate advances of glacier ice. The organic bed, known by its radiocarbon determination BIRM-166, produced an age of 30,500 radiocarbon years BP with a large uncertainty. A later Bayesian reconstruction of ice-sheet history places this evidence at about 33,500 ± 1,200 calendar years BP. The nominal date considered here therefore falls within the broad span illuminated by Derryvree, but cannot be identified with a particular season, generation or episode of sedimentation.

An Island Between Ice Advances

Derryvree demonstrates something fundamental: at some point before the last great expansion of the British–Irish Ice Sheet, part of Fermanagh was ice-free long enough for freshwater and wet-ground deposits to accumulate. The silt and organic material record standing or sluggish water in a cold landscape, before later ice overrode or buried it. This does not mean that the whole island was uniformly

open, hospitable or stable. Ireland’s relief, coastline, local ice masses and climate varied, while the available evidence is patchy. It does, however, rule out the simple picture of an island continuously entombed beneath ice throughout the whole Late Pleistocene.

The landscape was not a familiar green Ireland. The plant and animal remains from Derryvree indicate open tundra vegetation and a periglacial regime: severe cold, repeated freezing and thawing, exposed ground, short growing seasons and little or no woodland. Wet hollows could nevertheless sustain freshwater plants, mosses and sedges. Such places were ecologically significant. They concentrated water, vegetation and invertebrate life within a wider terrain likely shaped by frost, wind and sparsely vegetated mineral soils. Derryvree is best understood as evidence for a cold wetland mosaic, not as a complete map of Ireland.

At about this time, sea level was far below its modern position because vast quantities of water were stored in continental ice. Ireland was consequently part of a much larger north-west European landmass than it is today, although its western and southern Atlantic margins remained maritime and conditions around it changed as ice and sea shifted. Land connections or narrowed water gaps made animal movement possible across regions that are now separated by sea. They do not prove an easy, permanent or single route into every part of Ireland; access depended on terrain, climate and the changing position of ice. Later, during the Last Glacial Maximum, the ice sheet expanded much more extensively across the Irish shelf and island.

Fossils from Castlepook

The most vivid Irish evidence from the wider interval comes from Castlepook Cave, near Doneraile in north County Cork. Excavated principally in the late nineteenth and early twentieth centuries, and once called Mammoth Cave, it yielded a remarkable collection of Pleistocene bones. Direct radiocarbon measurements on selected specimens have included mammoth, reindeer, giant deer, brown bear, wolf, spotted hyaena and lemmings. Several dates lie in the broad MIS 3 period, including specimens around 34,000–38,000 radiocarbon years BP, while others are considerably younger. The fauna establishes that cold-adapted and large mammals reached Ireland in this long phase of the Ice Age.

Yet Castlepook must not be treated as a photograph of one day in 31,262 BCE. Cave deposits accumulated over millennia. Carnivores could carry in prey; animals might die naturally or fall into crevices; water, collapse and later digging could move bones. The early excavations also left limited contextual records by modern standards. A reindeer bone dated to about 33,000 years ago has been reported as bearing a deep mark interpreted as fresh-bone butchery with a stone tool. If that taphonomic interpretation is confirmed, it would be striking evidence that people handled a reindeer in Ice-Age Ireland. The radiocarbon measurement dates the animal bone, however, not an identifiable human visit; the meaning of the mark is a separate question. It cannot by itself demonstrate a settlement, population continuity, named cultural group or migration route.

Animals, Food and Risk

It is reasonable to infer an open, productive but demanding environment from the combined Derryvree and Castlepook evidence. Reindeer are strongly associated with open, cold country; lemmings and Arctic fox similarly point towards conditions unlike modern Ireland. Mammoth and giant deer indicate that substantial herbivores could use parts of the landscape, while hyaenas and wolves indicate carnivores able to exploit animal concentrations and cave shelter. But these animals need not all have

lived together, nor must every species have been present in County Cork or Fermanagh at the same moment. The evidence supports changing communities across a long interval, rather than a neatly balanced food chain.

If people did reach Ireland then, their economy would have been based on hunting, scavenging, gathering and highly mobile use of seasonal resources, not farming. That is an inference from the wider Upper Palaeolithic world and from the possible bone modification at Castlepook, not something directly demonstrated by an Irish dwelling, hearth or tool workshop. No secure house, storage pit, grave, art panel, fishing installation or sustained occupation surface is presently attributable to this date in Ireland. A possible episode of carcass processing would suggest a brief task undertaken by a small party; it would not justify claims about permanent villages or a settled Irish population.

No Politics, No Recorded Belief

There is no evidence for political institutions, leaders, territorial states, diplomacy or organised warfare in Ireland at this point. Nor is there direct Irish evidence from around this date for ritual practice, formal religion, burial customs, language, music, visual art or systems of learning. These absences matter. It is tempting to fill the silence with images borrowed from better-known Upper Palaeolithic sites in France, Iberia or central Europe, but those regions have their own histories and much richer archaeological records. Comparable hunter-gatherer societies elsewhere show that mobile people could possess complex social ties, technical knowledge and symbolic traditions; that possibility cannot be converted into a fact about Ireland without local evidence.

What can be said is that survival in a periglacial environment required practical knowledge: recognising weather and terrain, finding drinkable water, reading animal movements, selecting shelter and handling stone, bone, hide or wood where available. These are general human capacities rather than documented Irish customs. The possible Castlepook cutmark has importance precisely because it may preserve a minute physical trace of such knowledge—the controlled use of a sharp edge on animal bone—where almost all other human actions have vanished.

Approaching the Great Glaciation

The long-term regional change was towards more extensive glaciation. The last British–Irish Ice Sheet reached its greatest shelfward extent later, broadly between about 27,000 and 24,000 calendar years ago in sectors west of Ireland, with retreat beginning thereafter at different times in different places. Thus 31,262 BCE belongs before, rather than within, the clearest maximum phase. The distinction is important: a landscape capable of supporting wetlands and roaming mammals could subsequently be transformed, scoured and buried by ice. That later transformation helps explain why the record of earlier people, if they were present, is so extraordinarily slight.

Modern dating sharpens this picture without eliminating uncertainty. Radiocarbon years are not identical to calendar years because atmospheric carbon-14 has varied through time; samples must be calibrated against independently dated records. IntCal20 extends the Northern Hemisphere calibration framework to 55,000 calendar years BP, but dates in this range still produce probability ranges rather than annual certainties. At Derryvree and Castlepook, the challenge is doubled: scientists must establish both when a sample formed and what process placed, marked or preserved it.

Ireland around this nominal date is therefore not a story of kingdoms or commemorable events. It is a story of a cold island-region in transition: freshwater silts accumulating in a Fermanagh wetland; large mammals moving through open country; caves retaining bones from different episodes; and a possible humanly modified reindeer femur demanding careful scrutiny. Derryvree provides the environmental setting, Castlepook the faunal depth, and glacial research the larger framework. Together they show that Ireland was neither timeless nor empty in any simple sense, but a changing Ice-Age landscape whose human history remains tantalisingly, and responsibly, incomplete.

Chapter 040 of 100

31261 BCE

Maguirebridge’s Frostwater Flora [40]



The label 31,261 BCE is a modern chronological convenience, not a year that anyone in Ireland could have counted or recorded. It corresponds approximately to 33,210 calibrated years before present, using the archaeological convention in which “present” is AD 1950. At this depth of time, neither radiocarbon dating nor glacial stratigraphy can identify an event within a particular twelve-month span. The responsible approach is therefore to examine the Late Pleistocene landscape of Ireland during the broader interval in which this nominal date falls: Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age.

This was not an Ireland of kingdoms, farms, monuments, villages or written tradition. It was an intermittently habitable northern landmass whose landscapes were repeatedly altered by cold, ice, meltwater and changing sea levels. The surviving record is fragmentary because later glaciers eroded, buried and redeposited older sediments across much of the island. Yet a handful of caves, buried organic beds and glacial landforms allow a careful reconstruction of conditions. They reveal local environments and broad phases of change, rather than a national scene frozen at one precise date.

A Freshwater Interval at Derryvree

The strongest Irish environmental evidence relevant to this period comes from Derryvree townland, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a remarkable sequence. Organic freshwater silts and fine sands lay between two separate deposits of till, the unsorted debris left by moving glacier ice. The order of the layers is itself important evidence. Ice had occupied the locality before the organic sediments formed; then a period without local glacier cover allowed water, mud, plants and small animals to accumulate; later ice advanced again and sealed the deposit beneath fresh till.

Organic material from the Derryvree bed produced a conventional radiocarbon result of about 30,500 radiocarbon years BP, with a substantial uncertainty. When considered through modern calibration, discussion of the deposit places it broadly within roughly 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The nominal year considered here falls within that wide range. That overlap is useful, but limited: it means Derryvree can illuminate the kind of Irish environment that may have existed around 31,261 BCE; it does not date every grain of silt, plant fragment or pool at the site to that year.

The Derryvree sequence also supplies an essential corrective to a simple image of an entirely ice-covered Ireland. It demonstrates that, during part of the Middle Midlandian glaciation, this area of Fermanagh contained a freshwater environment between glacial advances. It does not demonstrate that all parts of Ireland were simultaneously free of ice, nor does it establish a stable island-wide climate. Ice-sheet margins and local conditions changed through time, and the evidence for the earlier stages of the last glaciation remains much less secure than that for its later maximum.

Tundra, Pools and Frozen Ground

The biological remains at Derryvree point to open tundra-like vegetation and a periglacial climate. Pollen of herbaceous plants, mosses, plant macrofossils and insect remains indicate a landscape with wet ground, shallow water and sparse dry-land cover. Sedges and mosses could thrive around pools and saturated hollows; cold-adapted plants occupied exposed ground. Such a setting was not a lifeless white desert. It was a working ecosystem, with seasonal growth and freshwater habitats, but one constrained by a short growing season, harsh winters and ground affected by frost.

Small quantities of tree pollen should not be turned into evidence for local woodland. Pollen can travel considerable distances, and the wider assemblage is overwhelmingly consistent with treeless or near-treeless country. Nor should the word “tundra” suggest a single uniform surface. The Derryvree evidence instead implies a mosaic: wetter margins, pools, silty shallows, mossy ground and more open, drier patches. The contrast between the freshwater sediment and the tills above and below it reminds us that even this mosaic was temporary on geological timescales.

Climate across the North Atlantic during MIS 3 was marked by abrupt shifts, recorded especially clearly in Greenland ice cores. Ireland stood at the Atlantic edge of that volatile system. It would have experienced the consequences in temperature, precipitation, snow persistence, vegetation and the extent of ice. The landscape around 33,000 calibrated years ago should therefore be understood as part of a changing sequence rather than as the opening stage of a settled, predictable climatic regime.

The Cave-Bone Record in Cork

In north County Cork, Castlepook Cave near Doneraile provides a very different archive. The cave, also known as Mammoth Cave, has yielded one of Ireland’s richest Pleistocene vertebrate assemblages. Finds from its chambers and deposits include remains attributed to animals such as reindeer, giant deer, wolf, brown bear, Arctic fox, hare, lemmings, woolly mammoth and spotted hyaena. Together, these remains show that Ireland was connected ecologically, at least at intervals, to the wider north-west European Ice Age world.

That statement needs caution. Cave collections were often recovered during early excavations, when recording methods were uneven by modern standards. Bones may have been moved by animals, water, excavation or later disturbance; specimens from different episodes can become mixed. Recent

reassessment of radiocarbon measurements has shown why older determinations require renewed scrutiny. A species found in Castlepook Cave cannot automatically be placed at Derryvree, nor can every animal in the cave fauna be assigned to 31,261 BCE.

Nonetheless, the faunal evidence makes the cold landscape more tangible. Reindeer and hare suit open country; lemmings and Arctic foxes indicate severe climatic conditions; large herbivores could exploit the seasonal productivity of steppe-tundra vegetation. Predators and scavengers, including wolf and spotted hyaena, belonged to the same food web. A hyaena den is not evidence of human habitation, but it does show that caves were contested or repeatedly used refuges within an animal landscape. The remains offer a picture of ecology, not a list of creatures seen together on one day.

The Human Question

The possibility of people in Ireland during this broader period is one of the most important and least settled questions. A reindeer femur from Castlepook has been reported as bearing an incision consistent with a stone-tool cutmark and has been associated with an age of roughly 33,000 years. If its context, date and interpretation are confirmed together, it would be exceptionally early evidence for human activity in Ireland, long before the well-attested post-glacial settlement of the island.

For this particular nominal year, however, the claim must remain carefully phrased. The bone is not a house, hearth, tool assemblage, human burial or securely excavated camp. It cannot demonstrate a permanent population, a named group, or continuous occupation. Nor can it establish that people were present in 31,261 BCE itself. At most, it raises the possibility that small Upper Palaeolithic parties reached, crossed or used parts of Ireland during a broader MIS 3 interval. Such visitors may have been highly mobile hunters following animal resources, but that is an interpretation based on the wider European archaeological context rather than a fact directly demonstrated by an Irish settlement site.

The distinction matters because later evidence is clearer. The butchered bear bone from Alice and Gwendoline Cave in County Clare dates to the terminal Pleistocene, around 12,800–12,600 calibrated years BP, and provides evidence for human activity many millennia after the period considered here. Substantial evidence for more enduring settlement belongs later still, in the Mesolithic. The great chronological gap warns against projecting later communities, identities or technologies backwards into the Middle Midlandian.

No Polities, No Diplomacy

There is no evidence for political institutions, rulers, territorial states, warfare between organised Irish communities, diplomacy, religion or formal learning in Ireland at this date. It would be misleading to fill those headings with imagined clans or rituals. If humans did occasionally enter the island during MIS 3, their social organisation cannot be recovered from the current Irish evidence. The same restraint applies to economy and trade. No Irish evidence demonstrates farming, metalworking, long-distance exchange networks, permanent markets or maritime commerce around 31,261 BCE.

There were, however, ecological connections. The presence of continental-style Ice Age fauna implies routes by which animals could disperse between Ireland, Britain and mainland Europe during suitable phases of low sea level and changing ice extent. The exact geography and timing of those routes remain debated. Lower sea levels did not automatically create a simple dry land bridge, and glacial ice, cold seas, rivers and exposed coastal plains could each facilitate or obstruct movement. For animals and any human visitors, access was a shifting geographical problem rather than a permanent corridor.

Approaching a Greater Freeze

The landscape represented by Derryvree belongs before the fullest expansion of the later British–Irish Ice Sheet, conventionally associated with the Last Glacial Maximum. Reconstructions increasingly show that this ice sheet developed asynchronously: different sectors advanced, merged, thickened and retreated at different times. By the later part of the glacial cycle, extensive ice reshaped much of Ireland and removed or concealed earlier evidence. The survival of the Fermanagh freshwater bed is therefore especially valuable, precisely because it records a local interruption in glacial conditions.

Ireland around 31,261 BCE was thus a place of environmental possibility and deep uncertainty. At Derryvree, freshwater and cold-adapted vegetation existed during a broad ice-free interval. At Castlepook, cave deposits preserve evidence of a rich, changing Ice Age fauna and a tantalising but still limited question about early human activity. These are not foundations for an annual political narrative. They are the surviving traces of tundra pools, animal movements and advancing ice: enough to show that the island had a history at this depth of time, but not enough to turn one modern calendar year into a recorded human episode.

Chapter 041 of 100

31260 BCE

BIRM-166’s Mossy Reedbed [41]



The label 31,260 BCE is useful for ordering deep time, but it must not be mistaken for a date at which an Irish event can be placed. It corresponds only approximately to 33,210 years before the conventional radiocarbon reference year of AD 1950. Ireland then lay in the Late Pleistocene, during Marine Isotope Stage 3 (MIS 3), a climatically unstable interval within the last Ice Age. There are no annals, named peoples, political communities or calendar-dated actions. Even the best scientific evidence normally yields probability ranges spanning centuries or millennia. The responsible history of this point is therefore an account of landscape, animal life and the narrow limits of what archaeological traces may indicate.

Dating an Uncalendared Past

Radiocarbon dating does not identify a year in the modern historical sense. It measures residual radioactive carbon in material that was once alive, reports an age in radiocarbon years BP (“before present”, with present fixed at 1950), and then requires calibration against independently reconstructed changes in atmospheric carbon. Far back in the Pleistocene, calibration can produce wide or irregular calendar ranges. A result on an animal bone establishes, within a statistical range, when that animal died; it does not automatically date a scratch upon it, an imagined hunt, or the arrival of a human group.

The most valuable environmental anchor near this notional year comes from Derryvree, close to Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed freshwater silts and fine sands enclosed between two substantial sheets of till. The organic horizon produced the radiocarbon determination BIRM-166: 30,500 radiocarbon years BP, with a substantial uncertainty.

Published calibrated treatments have expressed its likely age broadly as about 36,900–31,700 calibrated years BP. Thus 31,260 BCE falls within the broad chronological span represented by that deposit, but cannot be assigned to a particular layer, season or episode within it.

A Wetland Beneath a Drumlin

Derryvree is unusually important because the later glacier effectively sealed a fragment of an older landscape beneath its debris. The freshwater sediments contained poorly preserved herb pollen, plant remains and an insect and other small-fauna record of cold conditions. Moss macrofossils were especially significant: they provided rare direct evidence for Irish vegetation during the last glacial period. The assemblage also included aquatic and wet-ground plants, including bogbean, demonstrating that even an austere landscape had ponds, slow water and saturated margins rather than being an unbroken expanse of bare frost-shattered ground.

The evidence supports a picture of open tundra around the Fermanagh basin. Herbs, sedges, mosses and low-growing plants occupied exposed ground; water gathered in hollows; and the soil was subject to periglacial conditions, freezing for part of the year and thawing during the warmer season. Trees were not a defining feature of this local record. A few grains of tree pollen can travel long distances or be redeposited, so they do not demonstrate nearby woodland. This was a biologically active but thinly vegetated environment, with short growing seasons and strong seasonal constraints.

That conclusion is evidence-based, but it should not be stretched into a photographic reconstruction of every Irish region. Derryvree records one locality in what is now northern Ireland. Altitude, exposure, drainage and proximity to ice would have varied sharply across the island. South-western lowlands, uplands, cave valleys and coastal shelves may each have offered different mixtures of snow cover, bare ground, wetlands and sparse forage. In a changing glacial climate, the map of usable habitat could alter markedly over generations.

Ice on the Move

At about 33,210 calibrated years BP, Ireland was approaching a phase of major ice-sheet growth, not yet securely describable as uniformly buried beneath the ice of the Last Glacial Maximum. Reconstructions of the British–Irish Ice Sheet show that its southern Irish Sea sector expanded over a long interval beginning around 34,000 years ago, while its fullest late-glacial extent came later, broadly around 27,000–23,000 calibrated years BP. The Derryvree freshwater horizon, laid down before it was overridden by a later ice advance, independently shows that at least part of north-central Ireland had been ice-free during a relevant MIS 3 interval.

There is an important qualification. Evidence from western Ireland has also been interpreted as indicating substantial earlier ice loading and high relative sea levels before the Last Glacial Maximum. Ice cover was not a simple on-or-off condition across Ireland: local glaciers, advancing ice margins, sea ice, changing drainage and ice-dammed water could coexist with open terrain elsewhere. The exact configuration at 31,260 BCE remains unresolved. What can be said is that the Derryvree landscape belonged to a cold interval between glacial episodes and that, on the larger timescale, the advance that would reshape much of Ireland was drawing nearer.

Later ice was a destructive as well as a depositional force. It scoured bedrock, moved sediment and buried or removed older soils and campsites. That helps explain why the archaeological record is so meagre. Absence of a surviving campsite is not proof that no person ever stood in Ireland during MIS 3;

equally, the loss of evidence is not a licence to fill the gap with presumed populations. The physical history of glaciation sets the limits within which early human archaeology must be read.

Castlepook’s Uneven Faunal Archive

In north County Cork, Castlepook Cave, also known as Mammoth Cave near Doneraile, supplies the principal Irish cave assemblage for animals of the last cold stage. Excavations undertaken mainly in the early twentieth century recovered remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings, among other species. The cave is of national importance, and much of its surviving collection is held by the National Museum of Ireland. It demonstrates beyond doubt that an Ice Age fauna reached Ireland during different parts of the Late Pleistocene.

It does not, however, provide a single, neatly contemporaneous animal community for 31,260 BCE. The old excavations took place before modern standards of stratigraphic recording, sample treatment and dating. Carnivores could have dragged bones into the cave; water and sediment movement could have disturbed them; and finds from different episodes may have been mixed. Modern reassessment and improved collagen pretreatment have shown that several southern Irish faunal dates were appreciably older than previously thought. In particular, some species once assumed to have persisted close to the Last Glacial Maximum may have disappeared locally much earlier, around 40,000 calibrated years BP.

The proper conclusion is both more cautious and more interesting. Castlepook records repeated access by cold-adapted animals to Ireland in MIS 3, rather than one frozen tableau. Reindeer are especially relevant to a tundra setting, but their presence should not be turned into a claim that herds passed Castlepook in the precise numbered year. Mammoths, predators and herbivores occupied food webs whose membership altered with climate, geography and access routes. Cave bones reveal presence over spans of time, not the daily rhythms of a single landscape.

The Human Question

A reindeer femur from the Castlepook collection has been reported as bearing a mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during the butchery of fresh bone. County Cork heritage material has placed the bone broadly at about 31,000 BC. If the cut-mark interpretation is sustained, it would be exceptionally important: it would indicate that one or more people processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the long-accepted evidence for human activity on the island.

Yet this is a possibility, not a demonstrated settlement history. No securely associated stone-tool assemblage, hearth, dwelling floor, burial, human remains, artwork or stratified processing area of comparable age has been recovered from Castlepook. The bone’s date is not a date for an exact cutting event, and the cave is not a sealed hunting camp. A mark on bone must be distinguished from damage made by carnivore teeth, sediment abrasion, excavation or other processes. Further excavations at Castlepook have sought surviving Pleistocene deposits precisely because a securely recorded context would allow these questions to be tested more decisively.

If people did visit Ireland in this broad period, the evidence permits only a modest inference: they may have been members of small, mobile foraging groups familiar with the wider north-west European world. A reindeer carcass could supply meat, marrow, fat, hide, sinew, antler and bone, and a sharp stone

edge would be an effective tool for dismemberment. But hunting, scavenging, the duration of a visit, the route taken and whether the people returned are all unknown. There is no basis for identifying an Irish tribe, language, religious practice or lasting descent from such a possible episode.

Society Beyond Recovery

Consequently, conventional headings such as political affairs, diplomacy, war, economy and learning have no direct content for Ireland at this date. There were no documented rulers, territories, alliances, battles, trade agreements or institutions. Nor is there evidence for farming, permanent villages, monuments, metalworking, writing or formal religious sites. To project later Celtic, medieval or modern Ireland backwards into this glacial world would be a serious anachronism.

The evidence does nevertheless illuminate conditions that shaped any life possible here. Seasonal cold and sparse plant cover limited reliable resources. Wetlands created local ecological niches; herbivores and predators moved through a landscape exposed to climatic change; caves could trap, preserve and confuse traces of animal activity. Lower global sea levels altered coastlines, while ice loading and local sea-level change made the geography of approaches to Ireland complex. Animal dispersal demonstrates that connections existed at intervals, but the precise routes and their accessibility to people cannot be reconstructed for one calendar-like year.

What 31,260 BCE Can Mean

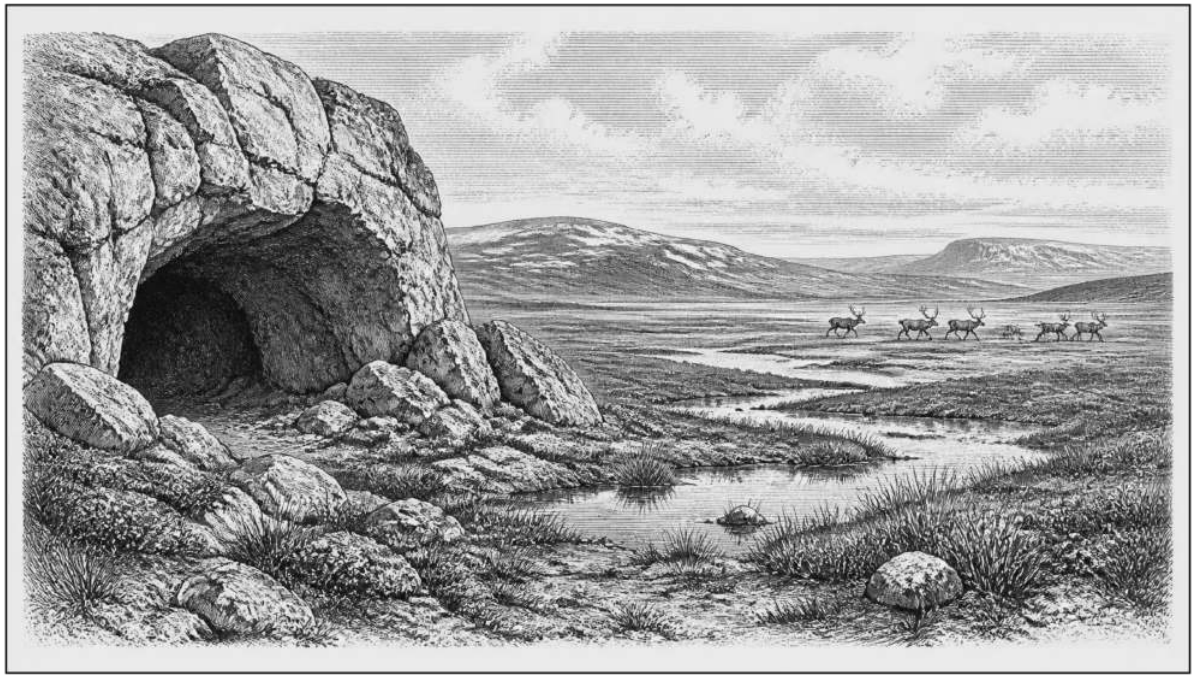
Ireland around this point was neither an empty abstraction nor a recoverable human society. It was a changing northern landscape in which freshwater wetlands could survive between ice advances, where tundra plants and mosses recorded a harsh seasonal climate, and where Ice Age mammals reached at least some regions during MIS 3. Derryvree’s sealed sediments are the clearest local witness; Castlepook’s cave fauna extends the picture into Cork and raises a provocative, still unconfirmed question about human activity.

The most defensible account therefore gives uncertainty its proper place. Modern calendar-year precision is unavailable. The broad calibrated range from Derryvree overlaps the date label, while the Castlepook material provides suggestive but contextually difficult evidence from a comparable era. Around 31,260 BCE, the history of Ireland is written not in events or names, but in buried freshwater silt, moss remains, cave bone and the approaching power of ice.

Chapter 042 of 100

31259 BCE

Castlepook’s Reindeer Landscape [42]



31,259 BCE is a modern chronological label, not a year for which Ireland preserves a recorded event. No calendar, named individual, settlement sequence or political history can be assigned to this point with year-by-year precision. In archaeological terms, it lies roughly 33,200 years before the conventional radiocarbon reference date of AD 1950, during the later part of Marine Isotope Stage 3 (MIS 3), a long, climatically variable phase of the last Ice Age. The responsible way to approach Ireland at this depth of time is through dated animal remains, cave deposits, fossil plants and insects, sediments, and the large-scale record of growing ice sheets.

The evidence does not describe an Irish nation, tribe or community. It does, however, show that parts of the island could support a striking cold-stage ecosystem before the Last Glacial Maximum. The richest archive is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Its bones, together with the environmental deposits at Derryvree near Maguiresbridge in County Fermanagh, make it possible to sketch a cautious picture of an open, cold, treeless Ireland inhabited by large herbivores and formidable carnivores, and perhaps visited briefly by people.

Time Without a Calendar

Modern BCE notation can give a deceptive impression of precision. Radiocarbon ages have uncertainties; their conversion into calendar ages requires calibration against independently dated records; and a bone or layer usually represents an interval, rather than a single event. The year 31,259 BCE should therefore be read as a point placed within broad ranges, not as a date on which anything identifiable happened in Ireland.

MIS 3 is conventionally placed at roughly 57,000 to 29,000 years ago. It was neither uniformly frozen nor steadily warming. Rapid North Atlantic climatic shifts altered temperatures, sea ice, rainfall, vegetation and the extent of glaciers over periods far longer than a human lifetime but short in geological terms. Around the time represented by this article, the Irish Ice Sheet was building towards its much greater Last Glacial Maximum extent. Research on Irish glacial landforms indicates an early phase of Scottish ice incursion into north-east Ireland at about 35,000 years ago, while the island-wide maximum came much later, broadly between 23,000 and 18,000 years ago.

This distinction matters. Ireland was not simply an unbroken white ice cap at 31,259 BCE. Conditions differed by region and changed through time. Some uplands and northern sectors may already have been affected by expanding ice, while lowland and southern refuges could at times sustain tundra and steppe-like habitats. The later advance of ice was also destructive: glaciers scoured ground surfaces, reworked sediments and removed or buried many traces that might otherwise record early human activity.

Castlepook’s Cold-Stage Fauna

Castlepook Cave is central because it has yielded Ireland’s most substantial collection of vertebrate remains from the middle and later stages of the last cold period. Excavations in the early twentieth century recovered a very large bone assemblage, though the methods and recording standards of the time leave major limitations. More recent re-dating has demonstrated that some older radiocarbon determinations underestimated the age of the fauna by thousands of years. The cave’s surviving record spans a long period rather than one neatly dated occupation episode.

The animals represented include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Not every species necessarily lived together at one moment, nor does every recovered bone belong to the vicinity of 31,259 BCE. Yet the assemblage securely establishes that Ireland, in suitable MIS 3 phases, was connected to wider north-west European ecological worlds very unlike the modern island.

Reindeer are especially informative. Their presence indicates cold-adapted grazing landscapes, probably with extensive herbaceous vegetation and seasonal movement across broad territories. Lemmings, Arctic foxes and mountain hares reinforce the evidence for harsh conditions and open ground. Mammoths and giant deer imply sufficient plant resources and range for very large herbivores. Spotted hyaenas, known in Ireland chiefly from Castlepook, point to a food web containing active predators and scavengers as well as carrion-rich cave accumulations. A cave, therefore, was not merely a shelter: it could be a den, a place where animals died naturally, a trap-like feature, or a site into which bones were dragged and disturbed.

The National Museum of Ireland identifies Castlepook as the country’s most important site for mammal remains from the last cold stage. Its fauna is evidence, not scenery. It demonstrates animal presence and broad habitat possibilities; it cannot by itself tell us the exact appearance of every valley, the size of herds, or whether a particular species was resident year-round. Nevertheless, it overturns any simple image of Ice Age Ireland as biologically empty before the final retreat of the glaciers.

Derryvree’s Open Tundra

A second vital source lies far to the north. In 1969, road works at Derryvree, near Maguiresbridge in County Fermanagh, exposed freshwater silts and fine sands sealed between glacial tills in a drumlin. The deposit yielded a conventional radiocarbon determination of 30,500 +1,170/−1,030 BP, alongside plant

and animal evidence interpreted as belonging to a full-glacial, periglacial environment. Because the measurement carries a substantial uncertainty and is expressed in radiocarbon rather than calibrated calendar years, it cannot be made to describe one exact BCE year. It is nevertheless directly relevant to the broader cold phase in which 31,259 BCE falls.

Derryvree preserved pollen, seeds, mosses and insect remains from a rare Irish inter-till landscape. The evidence points to open tundra vegetation: sedges and cold-tolerant herbs around wet ground, with sparse dry-land cover rather than closed forest. Finds including mountain avens, dwarf willow, bogbean, water-milfoil and distinctive mosses indicate a mosaic of shallow water, wet margins and exposed mineral ground. Such communities did not make the climate mild. They show, rather, that liquid water, short growing seasons and local vegetation could persist amid severe cold and frost action.

This environmental record is more secure than any attempt to populate the landscape with a particular human society. It suggests a patchwork of windswept ground, low plants, pools and sedge-rich wetland, not the later wooded Ireland familiar from historical imagery. In such terrain, animal movements would have followed forage, shelter, season and snow conditions. Rivers, lake margins and limestone caves concentrated resources and may also have concentrated the archaeological material that has survived.

The Reindeer Femur Question

The strongest possible human connection to this period is a reindeer femur from Castlepook. Public accounts have described the bone as about 33,000 years old and a deep linear mark upon it as consistent with cutting or chopping by a sharp stone tool while tissue was still fresh. If that interpretation is confirmed, it would be remarkable evidence that one or more people processed a reindeer in Ireland during MIS 3, vastly earlier than the long-established evidence for post-glacial settlement.

Its importance requires restraint. The dated bone establishes the age of the animal’s death, not automatically the age, maker or precise setting of the mark. A zooarchaeological judgement is needed to distinguish a tool mark from carnivore damage, breakage, sediment abrasion, trampling or excavation damage. Moreover, the femur comes from an old cave collection, not from an undisturbed excavation surface accompanied by a stone-tool assemblage, hearth, dwelling, butchered refuse scatter or human remains of matching date.

The most responsible conclusion is therefore conditional. The marked femur may record a brief Upper Palaeolithic visit and carcass processing; it does not yet prove a permanent Irish population, a camp at Castlepook, regular hunting territory, a migration route, language, ancestry or descendants. Fresh work at the cave has sought intact, stratified faunal deposits precisely because secure context is needed to test the older collection’s tantalising evidence.

People Beyond the Evidence

Across Europe, Homo sapiens communities of the Upper Palaeolithic made sophisticated stone tools, hunted and scavenged animals, used hides and plant materials, maintained social contacts across considerable distances, and in some regions created ornaments, figurative art and cave paintings. Those facts provide context, but they cannot simply be transferred to Ireland. No securely dated Irish hearth, lithic assemblage, burial, ornament, artwork or built shelter has been demonstrated for this particular phase.

Accordingly, political affairs, diplomacy and warfare are unknowable here. There is no evidence for chiefs, territories, alliances, raids or institutions in Ireland around this point. Nor can religion or learning be described beyond the general possibility that any visitors belonged to wider human communities with cultural knowledge and social traditions. To claim more would replace Irish evidence with a borrowed continental narrative.

Even the question of access must remain measured. Sea level was lower during the Ice Age, and scholarship places Ireland’s permanent island separation considerably later, around 20,600–18,100 calibrated years BP. This means that movement from Britain or the adjacent shelf world may not always have required the sea crossings familiar today. But no Irish find identifies a route, season, group size or direction of travel for MIS 3 visitors.

A Landscape Before Settlement

The economic history of 31,259 BCE is therefore principally ecological. Reindeer and other herbivores converted sparse vegetation into mobile concentrations of meat, hide, bone and antler; carnivores and scavengers followed them; caves preserved fragments of these relationships. If people reached Ireland, a reindeer carcass could have offered an important resource, but the evidence cannot say whether it was hunted, scavenged or encountered after another predator’s action. There is no evidence for farming, herding, metalworking, pottery, long-distance trade or settled villages.

What survives is a frontier landscape, not a society in the historical sense: a changing edge of north-west Europe where ice, water, grassland and tundra shaped the opportunities available to animals and perhaps to small groups of people. Castlepook and Derryvree matter because they preserve that opportunity in different forms—one through bones in a limestone cave, the other through a wetland deposit buried beneath later ice. Together they make 31,259 BCE meaningful without pretending that it was ever a recoverable Irish calendar year.

Chapter 043 of 100

31258 BCE

BIRM-166’s Fermanagh Wetland [43]



The label 31,258 BCE is a modern chronological convenience, not a date that can be recovered from an Irish calendar, event or individual life. No written record, named community or annually resolved archaeological sequence exists for Ireland at this depth of time. In years before present (BP), conventionally counted from 1950, the label falls about 33,207 years ago. It belongs broadly to the later part of the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3): an unstable phase of the last Ice Age, long before the Last Glacial Maximum.

Modern calendar-year precision is therefore unavailable. The responsible approach is to place this nominal year within calibrated ranges and to distinguish what the evidence demonstrates from what it merely suggests. The principal Irish evidence is environmental: sediment beneath drumlins in County Fermanagh, cave deposits in County Cork, and mineral deposits in caves in County Kerry. Together they reveal parts of an island that were, at different times, cold, open and biologically active before later ice advances erased or disturbed much of the record. They do not supply a diary of 31,258 BCE.

A Date Within a Wide Interval

The most relevant dated deposit is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a remarkable sequence: glacial till below, organic-rich freshwater silts and fine sands in the middle, and a further thick till above. Till is debris laid down directly by glacier ice. The order of layers is decisive evidence that, at this locality, an interval of open ground and freshwater conditions separated two episodes of glaciation.

Organic material from the intervening bed produced a conventional radiocarbon age of 30,500 radiocarbon years BP, with a substantial published uncertainty. Later calibration has expressed this broadly as about 36,900–31,700 calibrated years BP. The nominal year 31,258 BCE lies within that broad

span. Yet the range cannot establish that a particular pool, sedge bed, insect or animal was present in that precise calendar year. It is a chronological envelope for a deposit accumulated over time, not a timestamp for a single scene.

The sample designation, BIRM-166, has become an important shorthand in Irish Quaternary research because of this combination of stratigraphy, fossils and dating. Its significance is not that it proves all Ireland was ice-free at once. It proves that Derryvree had an ice-free freshwater interval before the later ice sheet overrode and sealed the site. Other evidence, including deposits at Greenagho in Fermanagh and marine evidence from the north-west, supports the wider conclusion that areas of Ireland remained ice-free during portions of MIS 3, before the final great expansion of the Irish Ice Sheet.

Cold Water Beneath a Drumlin

Derryvree offers the clearest local portrait of conditions relevant to this period. Its plant remains, pollen and insect evidence indicate open tundra or muskeg-like wetland rather than woodland. Mosses, sedges and other herbs flourished around shallow freshwater; the assemblage includes plants such as bogbean and water-milfoil. Such evidence establishes that liquid water, seasonal biological productivity and patches of wet ground existed. It also points to a landscape in which frost processes were important and trees were absent or extremely scarce.

“Tundra” should not conjure an unchanging white wilderness. The Derryvree record indicates a mosaic: pool margins, saturated mossy ground, sedgy vegetation and more exposed mineral surfaces, all responding to strongly seasonal conditions. Insects are especially valuable because many have narrow environmental tolerances. Their presence helps to identify cold conditions and wetland habitats that pollen alone could not describe so closely. Nonetheless, this was a local basin, not a weather station for the entire island. Uplands, coasts and southern lowlands may have differed considerably.

Crag Cave in County Kerry provides a complementary, though differently dated, archive. Speleothems – mineral deposits such as stalagmites – can grow only when water penetrates caves. Uranium-thorium dating shows episodes of speleothem formation in south-west Ireland during MIS 3. This is evidence for intervals with liquid water, soil activity and no continuous ice cover above that cave, rather than proof of mild or stable weather. Irish climate during this wider age was marked by rapid shifts linked to North Atlantic and Greenland climate variability. A thaw at one site did not guarantee an island-wide refuge, nor did it necessarily last long.

Animals on an Open Island

In County Cork, Castlepook Cave near Doneraile is the most important Irish archive for the vertebrate fauna of the period leading towards the Last Glacial Maximum. Antiquarian excavations recovered more than 2,000 bones from its maze of limestone galleries. The cave assemblage includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyena; later Ice Age layers also yielded cold-adapted small mammals and predators, including lemmings, Arctic fox and wolf.

These animals demonstrate that Ireland was not biologically empty throughout the period. Reindeer and mammoth indicate access to open, cold habitats, while hyena and wolf show that large predators could reach and exploit the same wider faunal world. But a cave is not a census of a single living community. Bones may have arrived through carnivore transport, death near an entrance, water movement

and human excavation; specimens from separate millennia can become associated in one collection. Castlepook therefore supports a picture of recurring animal movement through Ireland, not a claim that every listed species stood together on the Doneraile landscape in 31,258 BCE.

Re-dating has made that caution more pressing. Modern work on southern Irish cave fauna has shown that some radiocarbon results obtained in the 1990s were too young, owing to difficulties in dating old bone and in removing contamination. At Castlepook, revised results pushed several specimens thousands of radiocarbon years older. The scientific lesson is constructive rather than merely sceptical: museum collections, careful pretreatment and improved dating can transform what is known. It also means that claims based on one early date or one bone should be expressed as provisional.

The Human Question

The most intriguing evidence for people is a reindeer femur from Castlepook, reported as about 33,000 years old and bearing a deep mark interpreted by the zooarchaeologist Ruth Carden as the trace of cutting or chopping with a sharp stone implement. If that interpretation is confirmed, it would indicate that people handled and butchered a reindeer in Ireland during this broad part of the Ice Age. It would be highly significant evidence for an Upper Palaeolithic visit, perhaps by a very small mobile hunting party.

It would not, however, prove an Irish settlement, a permanent population, a known migration route or descendants among later inhabitants. There is no securely associated Palaeolithic hearth, stone-tool assemblage, dwelling floor, burial or repeatedly occupied site from Castlepook of this age. The bone derives from an old collection whose original contexts were disturbed and incompletely recorded by modern standards. Carnivore damage, natural breakage, trampling and excavation damage must always be distinguished from deliberate cutting. The National Museum of Ireland accordingly continues to state that clear evidence for a Palaeolithic human presence on the island has not yet emerged.

That disagreement should not be disguised. The marked femur is a serious, potentially important observation; the absence of a stratified archaeological assemblage limits what can responsibly be inferred from it. The strongest conclusion for this nominal year is that human presence is possible and may be indicated, while sustained habitation remains unproven. No named people, political units or languages can be placed in Ireland on this basis.

Society, Exchange and Belief

There is no direct evidence at this date for government, diplomacy, warfare, institutions, trade networks, ritual monuments, art or formal learning in Ireland. It would be misleading to manufacture them from the better-known Upper Palaeolithic cultures of continental Europe. If people reached Ireland, their likely scale of organisation was small and mobile, because that is the most economical interpretation compatible with one possible butchery trace and an open, seasonal animal landscape. It remains an inference, not an Irish archaeological fact.

The island was nevertheless connected to a larger north-west European ecological region. Lower global sea levels exposed parts of the continental shelf, while the precise routes between Ireland, Britain and the continent varied with sea level, local ice and topography. The presence of large mammals means that routes existed during at least some intervals, but does not prove a continuous dry land bridge usable at every moment. “Trade” cannot be demonstrated: there are no securely dated Irish objects of exotic material, nor any artefacts identifying exchange or social contact.

Everyday life is better documented for plants and animals than for humans. Wetland plants trapped sediment at Derryvree; insects occupied cold ground and freshwater margins; herbivores fed across open country; predators and scavengers redistributed carcasses into caves. This was an economy of ecosystems, not a recoverable human economy. The evidence supports seasonal productivity amid severe winters, but cannot tell us whether any people camped, travelled, hunted or sheltered there in a particular year.

Before the Great Advance

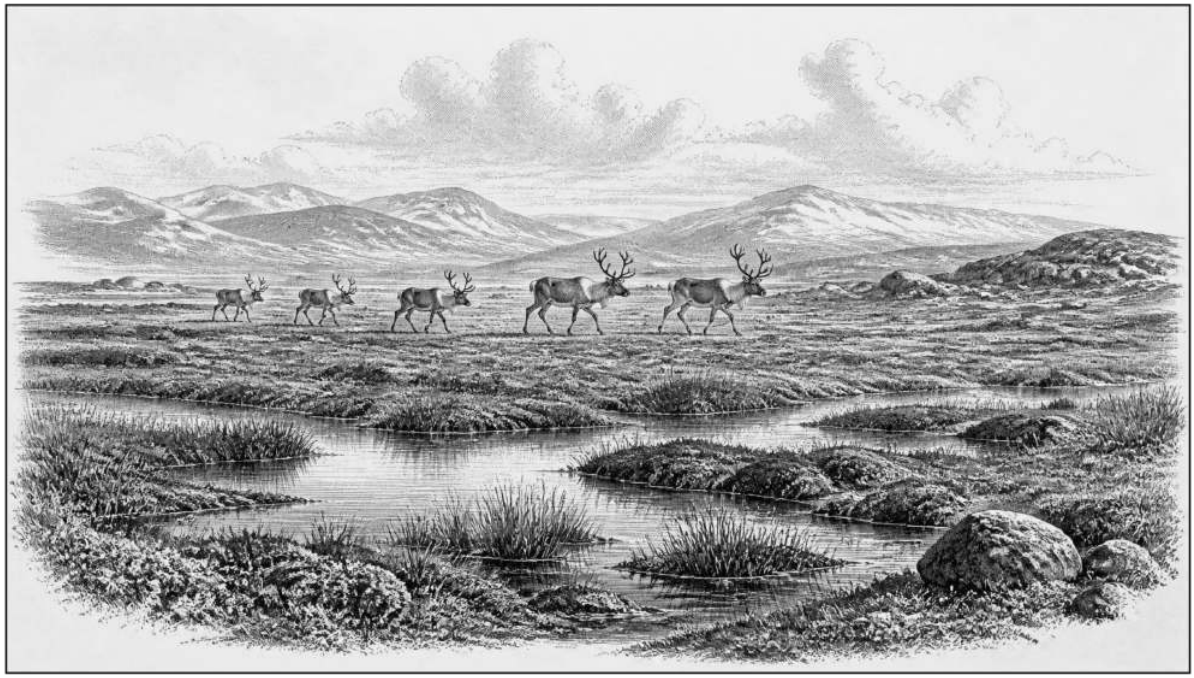
The major historical development around this nominal date was environmental: Ireland was moving through a climatically volatile Ice Age world before the later expansion of the Irish Ice Sheet. Evidence from Derryvree and Greenagho indicates ice-free ground in north-central Ireland during relevant intervals; Castlepook records an unusually rich fauna in the south; Crag Cave preserves signs of episodic liquid-water conditions in the south-west. After about 34,000 calibrated years BP, the ice sheet built and expanded unevenly, eventually reaching a much greater extent during the Last Glacial Maximum, broadly 26,500–19,000 years ago.

Later glaciation is also why the record is so fragmentary. Ice eroded older land surfaces, reworked sediments and destroyed many possible campsites. The absence of a known settlement is therefore meaningful but not conclusive. For 31,258 BCE, Ireland’s recoverable past is principally the history of a Fermanagh wetland buried beneath a drumlin, animals entering Cork limestone caves, and an unresolved mark on a reindeer bone. That is not a thin story. It is the earliest securely illuminated chapter of an island repeatedly remade by ice, water and life.

Chapter 044 of 100

31257 BCE

Maguirebridge’s Ice-Free Waters [44]



31,257 BCE is a modern chronological label, not a recoverable Irish calendar year. It corresponds to approximately 33,206 years before the conventional radiocarbon baseline of AD 1950. No written record, annual chronology, named community or dated event allows historians to describe a particular season—or even a particular generation—on the island at this point. The responsible subject is therefore Ireland during a broad Late Pleistocene interval, not an invented episode of national history. The most relevant evidence places parts of Ireland in Marine Isotope Stage 3, before the Last Glacial Maximum, when climates, ice margins, coastlines and animal populations could change greatly over centuries and millennia.

A Date Within a Range

The strongest directly relevant Irish environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts and fine sands sealed between two thick layers of glacial till. Till is the unsorted sediment deposited by ice; the sequence therefore records a simple but important order of events. Ice had covered the locality, an interval of non-glacial sediment accumulation followed, and ice later returned or expanded across it. The deposits do not provide a diary of one year, but they show that the landscape at Derryvree was locally ice-free when the organic layer formed.

Organic material from this layer, laboratory sample BIRM-166, produced a conventional radiocarbon age of 30,500 with an uncertainty of roughly 1,100 radiocarbon years before present. Earlier published calibrations place the deposit broadly at about 36,900–31,700 calibrated years before present. The notional date of 31,257 BCE, about 33,200 calibrated years before present, falls within that broad span. That is meaningful, but limited: it supports using Derryvree to illuminate the period, not assigning every

sediment, plant, animal or weather event there to this numbered year. Modern calibration curves also make clear why a conventional radiocarbon age cannot simply be subtracted from AD 1950 to yield an exact calendar date.

A Treeless Wetland Landscape

The Derryvree flora and fauna point to open tundra vegetation and a periglacial regime: an environment shaped by intense cold, seasonal freezing and thawing, and ground conditions unlike those of wooded modern Ireland. The evidence comes from minute biological remains preserved in wet sediment—plant macrofossils, pollen and invertebrate material—rather than from a surviving surface landscape. It indicates freshwater or waterlogged conditions, with pools and wet ground within an open, largely treeless setting. This was not a timeless sheet of ice, nor a familiar green island of hedgerows, pasture and forest.

Such evidence should not be exaggerated into a complete map. Derryvree represents one basin in what is now County Fermanagh, not every coast, valley and upland across the island. Nonetheless, it is exceptionally valuable because later ice advance eroded, redeposited and buried so much older ground. The organic bed survived because it was enclosed beneath glacial deposits. Its preservation gives a rare glimpse of a short-lived environmental interval within a much longer sequence of cold-stage instability.

The wider glaciological record confirms the importance of regional variation. At around 33,200 calibrated years ago, the British–Irish Ice Sheet was growing, but had not yet reached the maximum volume and extent associated with the later Last Glacial Maximum. Recent reconstructions show an extended period of ice-sheet build-up from about 31,000 years ago, with maximum total volume around 23,000 years ago. Other evidence indicates that north-central Ireland had remained ice-free until at least roughly 34,000 years ago. The best interpretation for this horizon is consequently one of changing margins: ice in some areas, ice-free land and freshwater habitats in others, and no basis for treating the entire island as either uniformly glaciated or uniformly habitable.

Castlepook’s Animal Archive

At the opposite end of the island, Castlepook Cave—also called Mammoth Cave or Doneraile Cave—in north County Cork provides the principal record of large vertebrates from the period leading towards the Last Glacial Maximum. Excavations undertaken in the early twentieth century recovered more than 2,000 bones. The cave deposits include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. A mammoth bone has produced a radiocarbon date around 33,500 radiocarbon years before present; dates across the overall assemblage demonstrate that the cave accumulated remains over a long period rather than during one single occupation or season.

This distinction matters. Castlepook was a repository affected by animal activity, water movement, cave processes and early excavation methods. Its animal list is evidence that these species reached Ireland during the wider cold-stage period; it is not proof that every species stood together outside the cave in 31,257 BCE. Nor should the cave be imagined simply as a human hunting camp. Spotted hyaenas were capable of carrying and modifying bones, while carnivores, scavengers and natural deaths all contributed to cave assemblages. The presence of both prey and predators instead reveals an ecological community more varied than Ireland’s later, isolated fauna.

For ordinary life among animals, seasonality must have been decisive. Grazers and browsers depended on sparse, cold-adapted vegetation; carnivores followed opportunities created by living prey and carrion; shelter was scarce on exposed ground. Mammoth, reindeer and giant deer demonstrate that large herbivores could use Irish landscapes during suitable phases, while lemmings and Arctic fox indicate cold-open habitats. This is secure environmental and faunal evidence. It does not establish population sizes, migration routes in a given year, or a stable “mammoth-steppe” stretching unchanged across all Ireland.

The Unsettled Human Question

One reindeer femur from Castlepook has made this period unusually important for Irish archaeology. The bone was radiocarbon dated to roughly 33,000 years ago and has been interpreted as bearing a modification made by a sharp stone tool while the bone was fresh. If that assessment is sustained, it would indicate that people processed an animal in Ireland during the pre-Last Glacial Maximum period—far earlier than the securely established post-glacial settlement record. It would be evidence for an encounter or brief visit, rather than evidence for a settled population.

The limits are equally important. There is no securely dated Irish hearth, dwelling, burial, stone-tool assemblage, occupation surface or human skeleton from around 31,257 BCE. Archaeological work at Castlepook in 2022 sought surviving Pleistocene deposits and found no cultural artefacts. The cut-marked-bone interpretation is therefore a significant possibility, not a licence to invent Palaeolithic villages, named hunter bands or a continuous ancestry linking any visitors to later Irish populations. Perishable equipment—wood, hide, fibre and much food waste—would rarely survive, but absence of durable evidence still requires caution.

If people did reach Ireland, comparison with Upper Palaeolithic groups elsewhere in north-west Europe suggests that mobility, hunting knowledge, shelter-making, fire and close attention to weather would have been essential. That is a reasoned inference from comparable societies, not direct evidence from Derryvree or Castlepook. No language, kinship system, leadership structure or social identity can be recovered. “Ireland”, “Fermanagh” and “Cork” are modern geographical terms, useful for locating the evidence but not names used by people then.

Politics, Belief and Exchange

There is no evidence for political affairs in the usual sense: no states, rulers, territories, assemblies, diplomacy, treaties or warfare can be identified. Predation and competition among animals should not be confused with human conflict. Equally, there is no Irish evidence from this horizon for shrines, formal burial, imagery, music, writing, ritual deposits or teaching institutions. People, if present, undoubtedly had knowledge and social practices, but archaeology cannot responsibly specify their beliefs or learning from the available Irish material.

Trade is similarly unrecoverable. Low sea levels altered the geography of the Irish Sea region and could have facilitated animal movement across landscapes now submerged, but the precise nature and persistence of routes to Ireland remain debated. No demonstrable exchange network, imported tool assemblage or maritime economy belongs to this date. The economy most securely visible is ecological: plants converting short growing seasons into biomass; herbivores using that vegetation; predators and scavengers exploiting animal remains; and freshwater wetlands preserving traces that later scientists can read.

Approaching Greater Ice

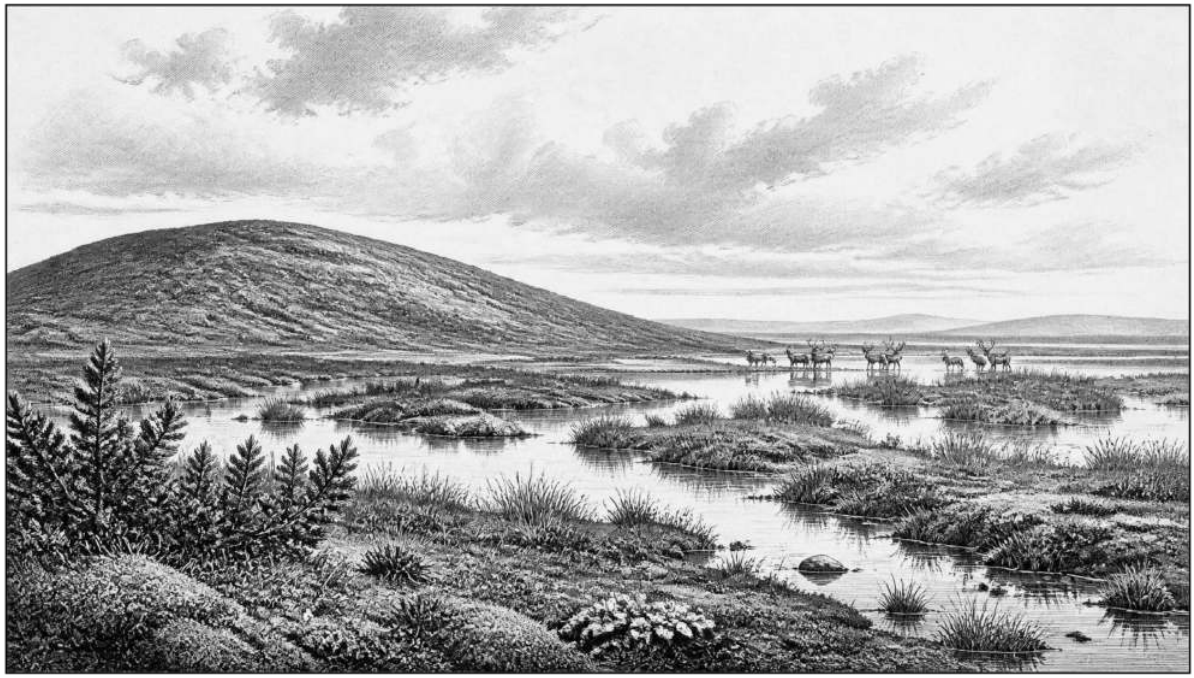
The long-term significance of this period lies in transition. The Derryvree sediment is testimony to an ice-free local interval, but its upper till shows that this condition did not endure. As the last British–Irish Ice Sheet enlarged, it transformed drainage, coastlines and habitats, eventually covering much of Ireland and its surrounding shelf. Ice erosion also helps explain the fragmentary nature of the earlier archaeological record: a potential campsite on exposed ground may have been removed, buried offshore, or never existed.

For 31,257 BCE, then, the most defensible Irish history is one of cold-water wetlands, open tundra, large mammals and an unstable glacial frontier. Derryvree offers the clearest local environmental testimony; Castlepook shows that a striking cold-stage fauna reached the island; the reindeer bone raises, but does not settle, the possibility of human activity. Beyond these findings lie interpretation and uncertainty. Respecting that boundary is not a failure of history. It is the way deep time can be described faithfully.

Chapter 045 of 100

31256 BCE

Derryvree’s Winter Wetland [45]



31,256 BCE is a modern calendar label, not a date that can be recovered from the Irish archaeological record. There was no written chronology, no named community and no excavated event to assign to this particular year. In radiocarbon convention it falls roughly 33,205 years before AD 1950, but that arithmetic must not be mistaken for annual precision. The responsible frame is the later part of the Middle Midlandian, Ireland’s regional name for a phase of the last glacial cycle, within Marine Isotope Stage 3 (MIS 3). Evidence can illuminate broad spans of centuries or millennia, not a day, season or political moment in 31,256 BCE.

The closest useful Irish window is a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its conventional radiocarbon determination, BIRM-166, was 30,500 +1,170/-1,030 radiocarbon years BP. Published calibrations have expressed its probable calendar age broadly at about 36,900–31,700 cal BP. The requested year falls within that wide range, but the range neither proves that a particular layer formed in 31,256 BCE nor permits a country-wide reconstruction for that year. It does establish something important: before later glacier ice overrode the area, part of northern Ireland supported freshwater, wetland plants and small animals in a severe but living landscape.

A Basin Between Ice Advances

Derryvree was exposed during road works in 1969, when a cutting passed through a drumlin: an elongated hill moulded from sediment beneath moving ice. Geologists found thick till beneath and above fine sands, silts and organic-rich deposits. Till is debris laid down directly by glacier ice. The sequence therefore records an order of events rather than an exact date: an earlier glaciation; an intervening, locally ice-free phase in which water and organic matter accumulated; then a renewed ice advance which sealed the evidence beneath another till sheet.

This is unusually valuable testimony. Much of Ireland’s earlier Pleistocene ground surface was eroded, displaced or buried by succeeding glaciers. Derryvree is not a preserved countryside awaiting excavation; it is a compressed environmental archive. Pollen, plant macrofossils, mosses and insects escaped destruction in waterlogged sediment. Their combined evidence indicates open, largely treeless tundra or muskeg: wet, peat-forming ground with pools and saturated margins, rather than forest or the familiar green agricultural landscape of modern Ireland.

Grasses, sedges, juniper and herb pollen point to low vegetation able to endure a short growing season. Mosses, including species associated with cold wet ground, and the remains of aquatic plants such as bogbean and water-milfoil show that at least some water remained unfrozen for long enough to sustain freshwater life and trap sediment. Beetles add another scale of observation. They provide evidence for open, cold conditions, damp plant-rich ground and pools, rather than merely confirming that the district was cold. The inference is not that every valley in Ireland looked identical. It is that this Fermanagh locality had a wetland mosaic within a regional climate harsh enough to prevent woodland from taking hold.

Cold Country, Not Permanent Ice

Around this horizon Ireland was part of a North Atlantic world in which climate changed sharply over long, irregular intervals. MIS 3 was not a single unbroken freeze. It included colder stadial phases and relatively milder interstadials, while ice margins advanced and retreated. The Derryvree organic layer is material evidence that this part of Fermanagh was not continuously ice-covered. Comparisons with Hollymount, also near Maguiresbridge, and Greenagho near Belcoo support the broader conclusion that northern inland areas experienced episodes of cold, non-glacial conditions before the fullest growth of the last Irish ice sheet.

That does not mean the island was safe from ice or that conditions were benign. Periglacial describes a landscape governed by frost, seasonal freezing and thawing near an ice margin. Soils would have been thin or unstable in many places, and vegetation vulnerable to wind, cold and short summers. Watercourses, ponds and wet hollows were disproportionately important: they concentrated life and, by preserving organic deposits, now dominate what can be known. Later, during the Last Glacial Maximum, ice expanded across much or all of Ireland and its surrounding shelf. Reviews place the major build-up after about 35–32 ka and the maximum broadly between 27 and 21 ka, although the timing varied between sectors. From the vantage of Derryvree, that destructive expansion still lay ahead.

Animals in the Southern Caves

County Cork offers a different, and less tidy, body of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile contains Ireland’s most important assemblage of mammals from the last cold stage. Finds include woolly mammoth, reindeer, giant deer, spotted hyena, wolf, Arctic fox, bear, mountain hare and two kinds of lemming. The National Museum of Ireland holds many specimens recovered during early twentieth-century cave investigations, while later work has added important material and improved dating.

The animals show that Ireland could be reached by a varied cold-climate fauna during MIS 3. Mammoth, reindeer and giant deer imply sufficient forage in open country; wolves and hyenas indicate a food web with large herbivores and carrion. Yet the cave collection cannot be read as a single herd grazing together beside a Cork cave in one year. Bone accumulations may derive from animal deaths,

scavenging, predator activity and repeated use of caves over long periods. Historic excavation methods recorded contexts less precisely than modern standards require, and later reassessment has shown that some older radiocarbon dates needed revision. The best evidence is for the presence of species within broad periods, not a complete local census or a neat ‘mammoth-steppe’ scene replicated across Ireland.

Re-dating of identified bones at Castlepook and other southern caves has been especially consequential. It indicates that some mammals occupied Ireland earlier in MIS 3 than older measurements suggested, and that giant deer and spotted hyena may have disappeared locally before the Last Glacial Maximum, around 40,000 cal BP. A mammoth bone has yielded a Middle Midlandian age, while museum educational material places giant deer at Castlepook around 31,000 years ago. Such results make the Cork fauna broadly relevant to 31,256 BCE, but they do not tie individual animals to the named calendar year.

The Human Question

A reindeer femur from Castlepook has made this period archaeologically significant. A deep mark on it has been interpreted as damage caused by a sharp stone tool during butchery, and the bone has been publicly presented as dating to about 31,000 BCE. If that interpretation is confirmed, it would be striking evidence that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland far earlier than the well-established terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

It remains essential, however, to distinguish evidence from interpretation. The bone is real; its broad antiquity is relevant; and the mark warrants serious investigation. But a mark on one bone is not an excavated camp. It does not demonstrate a permanent population, a dwelling, hearth, burial, stone-tool assemblage, boat, art tradition, language or named cultural group. The radiocarbon result dates the animal’s death within a range, not necessarily the instant the mark was made. Because Castlepook’s deposits are complex and were investigated over a long period, human butchery and a short hunter-gatherer visit remain plausible possibilities rather than settled facts.

Accordingly, political history has no evidential footing here. There are no rulers, territories, alliances, wars, laws or diplomatic relations that can responsibly be attributed to Ireland at this time. Neither is there Irish evidence for formal religion, monuments, ritual, schooling or written learning. Upper Palaeolithic people elsewhere in north-west Europe possessed sophisticated stone technologies and expressive traditions, but continental parallels are context, not proof that equivalent practices occurred in Ireland. If people did reach Castlepook, the most cautious social interpretation is of a small, mobile party whose contact with the island may have been brief.

Economy Without Markets

The only economy securely visible is ecological. Plants fixed seasonal growth in pools, sedge beds and open ground; herbivores converted that vegetation into meat, hides and bone; predators and scavengers exploited living animals and carcasses. If the Castlepook incision proves human-made, it would add one possible act of carcass processing to that system. It would still not establish trade, exchange routes, farming or a settled seasonal round. Sea level was lower during the wider glacial period, changing the geography of the Irish Sea region and potentially easing animal movement at some times, but exact routes and conditions at a particular moment remain uncertain.

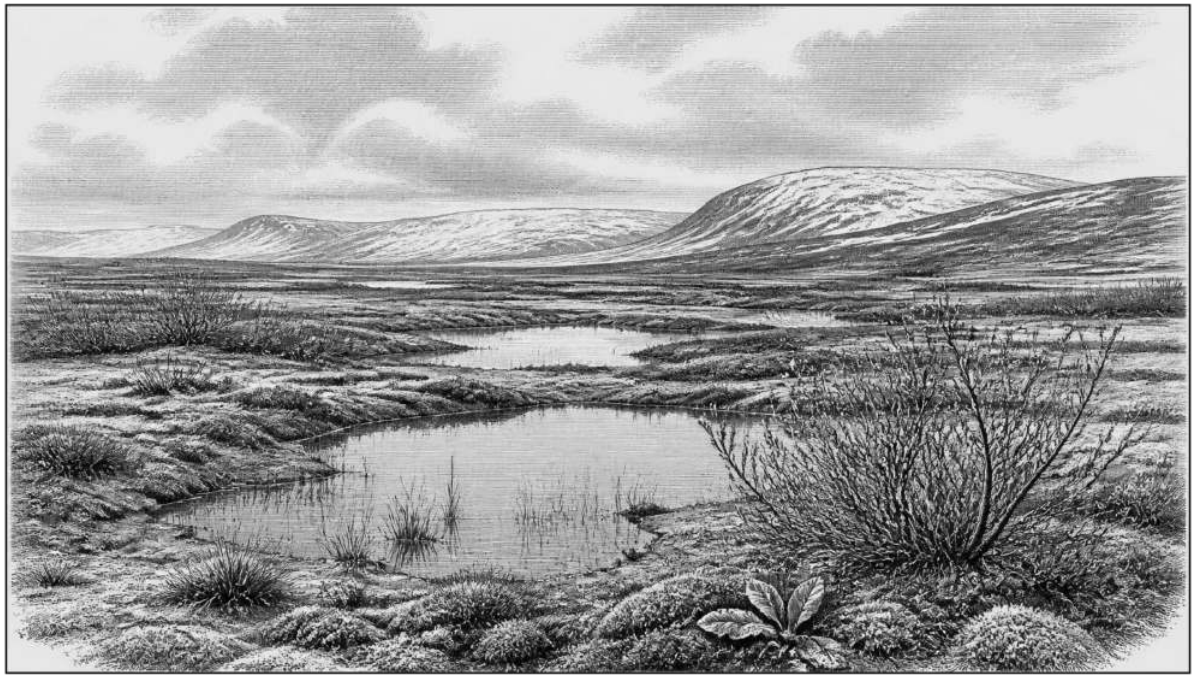
For Ireland around 31,256 BCE, then, the principal development was environmental rather than political: an unstable cold-stage landscape in which locally ice-free wetlands persisted, cold-adapted flora and fauna occupied available habitats, and future ice advances threatened to erase their traces. Derryvree’s

silts and Castlepook’s bones do not offer a calendar chronicle. They offer something more fragile but still remarkable: evidence that Ice Age Ireland was not simply blank beneath glacier ice, but a changing set of habitats whose history survives in pollen grains, beetle fragments, waterlogged plants and cave fossils.

Chapter 046 of 100

31255 BCE

Derryvree’s Two-Till Archive [46]



The label 31,255 BCE is a modern way of locating a point in deep time, not a year that can be recovered from an Irish chronicle. No known community in Ireland counted years in this fashion, and archaeology cannot assign an event, ruler, journey or settlement to this precise calendar year. The most responsible subject is instead a broad Late Pleistocene interval, within Marine Isotope Stage 3 (MIS 3) and the Irish Midlandian glacial episode. Its evidence is sparse, local and often difficult to date, but it is sufficient to overturn any image of a uniformly lifeless Ireland buried continuously beneath ice.

The closest chronological anchor is the Derryvree deposit near Maguiresbridge, County Fermanagh. Organic mud from this site produced the legacy radiocarbon determination BIRM-166, 30,500 ± 1,100 radiocarbon years before present. Radiocarbon years are not calendar years: changing atmospheric carbon-14 levels mean that measurements must be calibrated. Published calibration places the deposit very broadly at about 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. Thus 31,255 BCE falls within the range associated with the deposit, but it cannot be isolated within it. The date identifies neither the beginning nor the end of the Derryvree environment, much less a particular day in its history.

A Wetland Between Ice Advances

Derryvree was revealed during road works in February and March 1969, when a cutting passed obliquely through a drumlin about two kilometres north-east of Maguiresbridge. Beneath the modern land surface lay two substantial tills: unsorted sediment deposited directly by moving glacier ice. Between them was a freshwater series of fine sands, silts and organic mud. This arrangement supplies the firmest

conclusion available. Ice had affected the locality before the freshwater sediments accumulated; the site then experienced an interval in which standing or slow-moving water, plants and animals were present; and ice later returned or expanded across it, sealing the deposit below another till.

That sequence does not prove that all Ireland was ice-free at once. A drumlin cutting is a local archive, while ice sheets are large and uneven systems with shifting margins, outlets and upland centres. Nor do the deposits establish a stable, mild interlude. They record a cold, periglacial landscape: one close to glacial conditions and heavily shaped by frost, seasonal thaw and unstable drainage, but not necessarily covered by glacier ice while the freshwater layers formed. Later ice movement eroded or buried enormous areas of older terrain, helping to explain why this small Fermanagh exposure matters so much.

Modern reconstructions of the British–Irish Ice Sheet reinforce the need for caution. The major Last Glacial Maximum lay later, broadly between about 27,000 and 23,000 calibrated years ago for the final maximum advance of the Irish Ice Sheet. Around the period represented by Derryvree, ice was growing and climate was variable rather than frozen into one unchanging configuration. The island was part of a north-west European zone in which the extent of ice, snow cover, rivers and habitable ground could alter substantially over centuries and millennia. Those timescales are the appropriate measure for this article, not a single year.

Bogbean and Open Pools

Derryvree’s organic sediments preserve a remarkable biological record. Poorly preserved pollen, plant macrofossils, mosses and insects point towards open tundra vegetation, not forest. Grasses, sedges, herbs, juniper and low-growing cold-adapted plants occurred in or near the locality. The few grains of pine and hazel pollen do not demonstrate a nearby woodland; they may have travelled long distances or been redeposited from older sediments. The more consistent message of the assemblage is treeless, exposed ground with wet hollows.

Several fossils give this landscape texture. Bogbean (*Menyanthes trifoliata*) and alternate water-milfoil (*Myriophyllum alterniflorum*) attest to freshwater habitats. Dwarf willow (*Salix herbacea*) and mountain avens (*Dryas octopetala*) are plants associated with cold, open country. Mosses and insects have been interpreted as evidence for muskeg-like ground: waterlogged, plant-rich terrain, with shallow pools and mossy margins. “Muskeg” should not suggest a familiar modern raised bog. This was a patchwork of mineral sediment, organic mud, sedges, low vegetation and water, exposed to a far more severe climate than today’s Fermanagh.

Everyday life in this environment was seasonal and ecological rather than humanly documented. Short warmer seasons permitted plants to grow, insects to breed and freshwater organisms to occupy pools. Winter brought prolonged cold, frozen ground and snow, while repeated freezing and thawing broke up soils and moved sediment. Such processes produced demanding terrain, but the freshwater deposits themselves demonstrate that the locality was not an empty expanse of permanent ice. The productive margins of pools and wet ground would have concentrated forage and water for animals moving through the wider landscape.

The Southern Cave Fauna

At Castlepook Cave, also called Mammoth Cave, near Doneraile in north Cork, excavations between 1904 and 1908 recovered a far richer but more complicated assemblage. The National Museum of Ireland holds material from the cave, including spotted hyena remains. Castlepook has yielded bones of woolly

mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, stoat and lemmings, as well as the hyena. Taken together, these animals show that at intervals during MIS 3 Ireland supported, or was visited by, communities characteristic of cold northern European environments.

The cave does not provide a neat census for 31,255 BCE. Its deposits were excavated long before modern standards of recording, different layers were disturbed or mixed, and the bones did not all enter the cave at the same time. Improved radiocarbon pretreatment has also shown that some older Irish cave determinations were misleading. Re-dating has confirmed that important Castlepook material belongs to MIS 3, while also demonstrating why individual finds must not be casually treated as one contemporaneous animal herd or one episode of occupation. The fauna is secure evidence for a broader Ice Age world; its exact internal chronology remains a subject for careful reconstruction.

Spotted hyena is especially evocative but should not be romanticised. Hyenas may have used caves as dens, dragging in carcass parts or leaving bones through scavenging and feeding. Tooth marks, breakage and the distribution of remains can therefore record carnivore behaviour as much as the deaths of prey animals in the surrounding country. Mammoths and giant deer indicate large herbivores, reindeer imply cold-season grazing landscapes, while foxes, wolves and lemmings reveal several ecological niches. Yet absence from the fossil list is not proof of absence from Ireland: preservation, cave access, collecting history and later glacial destruction all shape what survives.

A Possible Human Signal

One Castlepook reindeer femur has drawn particular attention because it bears a deep linear modification interpreted by Ruth Carden as a cut or chopping mark made with a sharp stone implement while the bone was fresh. The bone has been associated with an age of roughly 33,000 radiocarbon years before present. If the mark is genuinely anthropogenic and contemporary with the animal, it may indicate that people butchered a reindeer in Ireland during the earlier part of the Late Pleistocene. That would be of exceptional importance, placing a human visit many millennia before Ireland’s securely dated terminal-Pleistocene butchered bear bone from Alice and Gwendoline Cave, County Clare.

It is not, however, proof of a settled population, a camp or a named Palaeolithic culture in Ireland at this date. No securely associated stone-tool assemblage, hearth, dwelling or human remains have been recovered from Castlepook’s old mixed deposits. A surface groove also requires taphonomic assessment against other possible forms of damage, including carnivore activity, sediment abrasion, trampling, excavation damage and later breakage. The responsible conclusion is that the femur is a serious and potentially very early proxy for human activity, not a foundation for claims about an Irish tribe, permanent settlement or a specific hunt in 31,255 BCE.

No Polities, No Trade Routes

Political affairs, diplomacy, formal religion and literacy leave no identifiable evidence in Ireland for this interval. There were no states, kingdoms, borders or institutions whose actions can be narrated. Nor is there evidence for trade in the later sense: no exchanged objects, imported materials or maintained routes can be tied to this date. If people did reach Ireland, they would have belonged to small, highly mobile hunter-gatherer groups within the wider Upper Palaeolithic world of north-west Europe. Their social organisation, beliefs, language and movements remain unknown in the Irish record.

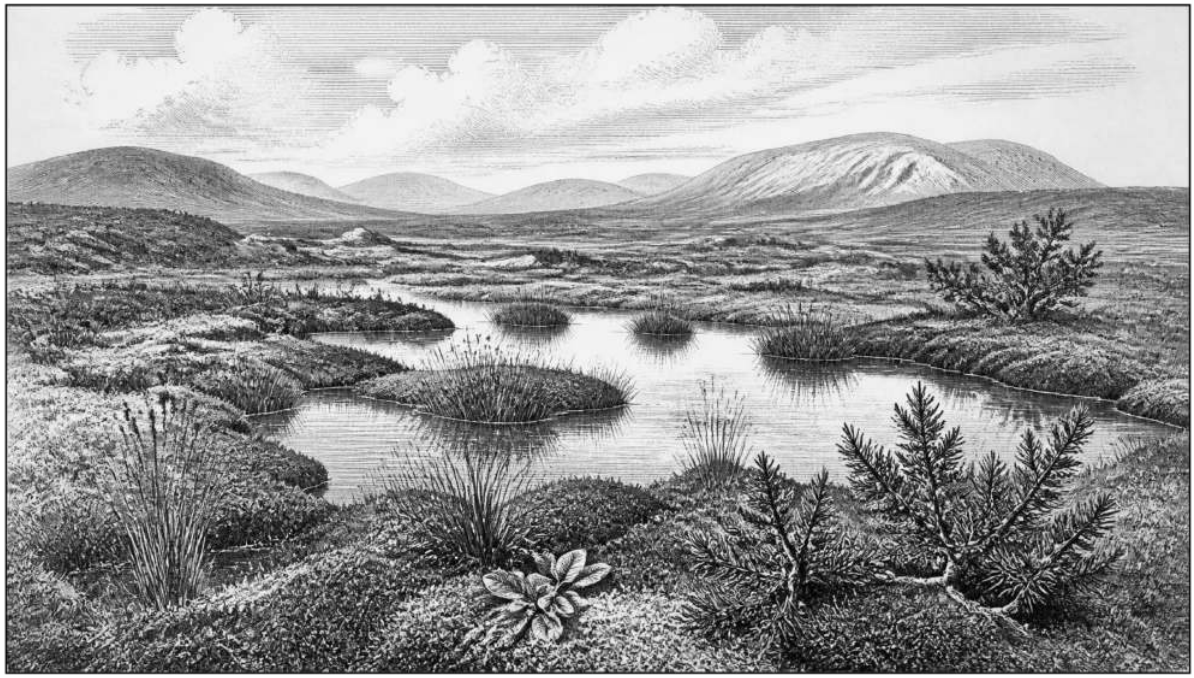
Connection with Britain and the exposed landscapes now beneath the Irish Sea is nevertheless central to interpretation. Sea level was much lower than today, and animal populations plainly reached Ireland at some point during the Late Pleistocene. Exactly how they crossed is unresolved. Researchers have long questioned the existence of a simple, durable dry land bridge across the Irish Sea; ice, shallow seas, changing coastlines and possible short-lived routes all complicate the picture. It is safest to say that Ireland was not ecologically isolated in the modern sense, while avoiding a map that turns uncertain crossings into a certain highway.

The lasting development around this notional year was therefore environmental. In Fermanagh, freshwater life accumulated between episodes of glaciation; in Cork, caves preserved traces of an Ice Age fauna whose chronology is still being refined. These scattered archives describe a changing land of tundra, wetlands, large mammals and severe climate. They also mark the limits of knowledge. Ireland’s history at 31,255 BCE is not an annual narrative, but a disciplined reconstruction from mud, pollen, insects, bones, ice and uncertainty.

Chapter 047 of 100

31254 BCE

A Bogbean Seed at Derryvree [47]



A Modern Date, Not an Ancient Year

“31,254 BCE” is a modern chronological label, not a year that anyone then living in Ireland could have named, counted or recorded. There were no written calendars, rulers, communities identifiable by name, or dated events from the island at this depth of time. In simple calendar arithmetic, the label lies about 33,200 years before 1950, within the later part of the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. Archaeology cannot responsibly reconstruct a particular spring, hunt or political occurrence for this nominal year. It can, however, assemble a careful picture of Irish environments and animal life from deposits whose broad age ranges encompass it.

The most useful evidence is not a monument or settlement but a small, waterlogged survival from County Fermanagh: organic freshwater sediments discovered at Derryvree, near Maguiresbridge. Road works in 1969 cut through a drumlin and revealed fine sands and organic silts trapped between two sheets of glacial till. Their order matters. The lower till records an earlier episode of ice cover; the organic bed records a subsequent interval in which water, plants and insects could occupy the locality; the upper till shows that ice later returned and sealed much of the evidence. This is a landscape archive, rather than a historical chronicle.

A conventional radiocarbon determination from the Derryvree organic bed, Birm-166, was reported as 30,500 radiocarbon years before present, with an uncertainty of roughly +1,170 and −1,030 years. Radiocarbon years are not calendar years: “present” is fixed at 1950, and changing atmospheric carbon means results require calibration. Discussed against modern calibration curves, the determination produces a very broad range of approximately 36,900–31,700 calibrated years before present. The

numerical point represented by 31,254 BCE falls within that interval, but the range is emphatically not a date for a single event. It dates the formation of sampled organic material within a deposit accumulated over time.

Water Between the Ice Sheets

Derryvree provides strong evidence that this part of Fermanagh was ice-free when the freshwater sediments formed. It does not prove that all Ireland was similarly free of ice on the same day, decade or century. Ice cover during MIS 3 was regionally variable and repeatedly changing. The British–Irish Ice Sheet reached its best-established maximum much later, around 27,000–23,000 calibrated years before present, when Ireland and much of its continental shelf were ice-covered. At the earlier date considered here, the surviving Irish record instead points to a complex geography of local ice advances, cold ice-free terrain and wet basins.

The landscape around Derryvree was not the wooded Ireland familiar today. Pollen, plant macrofossils and insect evidence indicate open, treeless ground with grasses, sedges, herbs, juniper and a specialised moss flora. Researchers have described it as tundra or a muskeg-like wetland: saturated ground, shallow pools, plant-rich margins and mossy hollows set within a cold periglacial environment. The detail is important. “Tundra” should not conjure a featureless snowfield. The organic bed records liquid freshwater, aquatic and wetland vegetation, and seasonal ecological productivity, although within a harsh climate marked by cold winters, short growing seasons and frost-affected soils.

One particularly evocative find is a seed of bogbean, *Menyanthes trifoliata*, a plant of pools, fens and wet margins. Its recovery confirms that suitable freshwater habitat existed locally. Other identified remains, including mountain avens and cold-adapted mosses, reinforce the picture of an open northern environment. Yet evidence must be read at its proper scale. A pollen grain can travel far on the wind or be redeposited; sparse tree pollen does not demonstrate a nearby forest. Likewise, a wetland deposit tells us most directly about its own catchment, not every Irish coast, upland or valley. The responsible reconstruction is therefore of a local cold freshwater mosaic, not of a uniform island-wide scene.

Animals on a Cold Island

Fermanagh’s plant bed is complemented by cave faunas from southern Ireland, especially Castlepook Cave, also called Mammoth Cave or Doneraile Cave, in north County Cork. Castlepook is Ireland’s richest known archive for vertebrates living before the Last Glacial Maximum. Its finds include woolly mammoth, giant deer, reindeer, brown bear, spotted hyaena, wolf, Arctic fox, red fox, mountain hare and both collared and Norwegian lemmings. Not every bone derives from precisely the same moment: cave deposits were accumulated, disturbed by water and excavated in stages during the early twentieth century. Direct dating has nevertheless demonstrated that parts of the assemblage belong to MIS 3, with individual bones spanning a long period before and into the later Ice Age.

These animals make the Derryvree landscape easier to imagine, but they should not be mechanically placed beside its pool on the exact nominal date. The evidence supports a broader conclusion: at intervals during this cold phase Ireland could sustain a varied community of large herbivores, smaller cold-adapted mammals and formidable predators. Reindeer and giant deer would have found browse and herb-rich open ground; mammoths indicate access to extensive grazing landscapes somewhere within their ranges.

Hyaenas are especially significant because caves often became repositories of bones through carnivore activity as well as through natural transport. A bone in a cave is not automatically evidence of a human meal or a human home.

There is no basis for imagining farms, permanent villages or a settled population at Derryvree. No house floors, hearths, fields, burials, tool-making sites or food stores of this age have been securely identified in Ireland. Human political affairs, diplomacy, organised warfare, law and institutions are therefore beyond the evidence. So too are claims about religion, language, artistic traditions or long-distance trade. The deepest history of Ireland at this point is ecological and geological, and its protagonists are ice, water, plants and animals rather than named people.

The Castlepook Human Question

There is, however, one potentially momentous qualification. A reindeer femur from Castlepook has been interpreted as carrying a deep cut or chop made on fresh bone by a sharp stone implement. The bone has been publicly associated with an age around 33,000 years ago. If the mark is confirmed as humanly made, it would indicate that one or more Upper Palaeolithic people processed a reindeer in Ireland during a broad period relevant to 31,254 BCE. Such an act might have involved scavenging, hunting or the butchery of an animal obtained by unknown means. It would not, by itself, establish permanent occupation.

The caution is not pedantry but the heart of the issue. Castlepook’s crucial material comes from old excavations and from deposits affected by water and animal activity. There is no securely associated stone-tool assemblage, hearth, dwelling surface, human skeleton or repeated occupational sequence of comparable MIS 3 age. Dating establishes the age of the animal bone, while identifying a surface modification as a stone-tool mark is a separate taphonomic judgement. Renewed survey and excavation have located surviving Pleistocene deposits in parts of the cave, offering the possibility that future work may improve the context. For now, the femur is a serious but limited clue to transient human presence, not evidence for an Irish society.

That distinction also shapes any discussion of economy. If people did reach Ireland in this period, their subsistence would most plausibly have depended on highly mobile foraging, with animal carcasses offering meat, fat, hides, sinew and bone. But that is an inference from the possible cut-marked femur and wider Upper Palaeolithic practice, not a directly documented Irish economy. There is no evidence here for exchange networks, managed herds, cultivation, metallurgy or maritime commerce. Nor can the available record establish the route by which any visitor arrived, whether by a changing coastal corridor, a crossing from Britain, or another path through a landscape later transformed by sea-level change and glaciation.

What the Buried Wetland Preserves

Derryvree’s importance lies partly in what happened afterwards. Later ice advanced across the region, reshaping terrain and removing or burying many older land surfaces. That destructive power helps explain why Ireland’s pre-Last Glacial Maximum archaeological record is so sparse compared with Britain’s. Yet at Derryvree the upper till also acted as a seal. Beneath a drumlin in Fermanagh, the silts retained traces of pools, sedges, mosses, insects and a bogbean seed from an otherwise vanishing world.

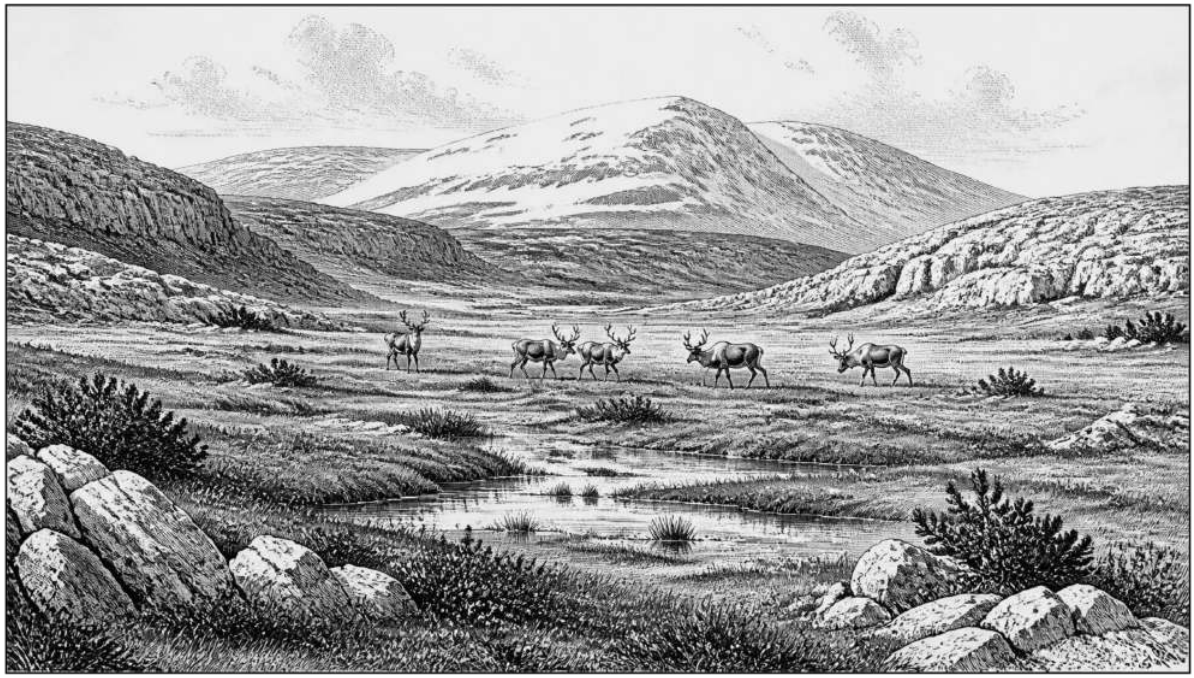
For Ireland around this notional date, then, the most defensible account is one of cold environmental opportunity amid instability. In at least one northern basin, open wet tundra supported freshwater life between episodes of glaciation. Elsewhere, especially in the limestone caves of the south, a varied Ice Age

fauna demonstrates that large mammals and predators reached the island during MIS 3. The possibility of a brief human visit at Castlepook remains important, but unproven as evidence of settlement. No ancient person could have recognised “31,254 BCE”; the date is our own grid laid over a vast span. The real testimony comes from the sediment: water lingered, bogbean grew, animals moved through open country, and later ice concealed the fragile record.

Chapter 048 of 100

31253 BCE

Aghnadarragh Beetle Assemblage [48]



The label 31,253 BCE is a modern way of placing a point deep in the past, not a year for which Ireland has an annal, a ruler, an event or even a season. No calendar was in use on the island that can be correlated with this date, and neither archaeology nor palaeoenvironmental science can resolve activity so far back to a single calendar year. In arithmetic terms it lies about 33,200 years before AD 1950, conventionally written c. 33.2 ka cal BP. The responsible approach is therefore to examine the wider Late Pleistocene interval around that point, especially the evidence from Irish caves, glacial deposits and fossil-rich sediments.

A Changing Ice-Age Landscape

This was part of Marine Isotope Stage 3 (MIS 3), a long, climatically unstable phase of the last glacial cycle, broadly between about 57,000 and 29,000 years ago. Ireland was not yet in the fullest grip of the Last Glacial Maximum. Later ice would remodel and bury large parts of its surface, but current reconstructions indicate that, as the final British–Irish Ice Sheet expanded after c. 31,000 cal BP, ice caps and mountain glaciers grew in some Irish uplands while other ground remained exposed. Conditions varied greatly by region, altitude and century. It would be misleading to call either all Ireland ice-free or all Ireland ice-covered at c. 33,200 cal BP.

The landscape was also not the island familiar today. Sea level stood far lower than at present, and the outlines of coasts, estuaries and plains were different. Connections across the surrounding shelf may at times have made movement by animals and people less difficult than the modern sea map suggests, although the exact routes available at any particular moment remain debated. What is secure is that Ireland formed part of the north-west European ecological world: large mammals reached it during MIS 3, and incoming ice later erased or concealed much of the evidence they and any people left behind.

Cold did not mean featureless. Geological and biological archives point to a mosaic of open ground, grass- and herb-rich patches, wet hollows, streams, ponds and sparse shrub cover, changing as climate shifted. The wider interval is often described through terms such as tundra, steppe-tundra or mammoth-steppe. Each is useful shorthand, but none should be treated as a complete map of Ireland on one day. Local shelter, soils, drainage and proximity to ice would have produced contrasting habitats over short distances.

Fermanagh’s Buried Wetlands

One important environmental archive comes from Derryvree near Maguiresbridge in County Fermanagh. There, organic freshwater deposits were preserved between layers of glacial till. Pollen, plant macrofossils, insects and sediments provide rare evidence for an interlude when this part of northern Ireland supported standing or slow-moving fresh water and vegetation before a later ice advance sealed the deposits. The sequence is valuable precisely because it records more than animal bone: it preserves parts of a living wetland landscape.

The Derryvree evidence supports an interpretation of cold, largely open country with freshwater habitats, rather than woodland resembling later Holocene Ireland. Mosses, sedges and aquatic plants signal wet ground and shallow water; insects add clues about local temperature and habitat. But the deposit is not a national weather station. It cannot demonstrate that every Irish valley had identical vegetation, nor can its radiocarbon determinations be converted into a precise observation for 31,253 BCE. Its importance lies in showing that viable, varied environments existed in at least some parts of Ireland during the broader Middle Midlandian, or MIS 3, period.

Other intertill deposits, including those at Greenagho in County Fermanagh and Aghnadarragh in County Antrim, underline a larger point. Ireland’s glacial history was not a simple sequence in which ice arrived once, covered everything uniformly and vanished. Deposits formed in intervals between ice advances preserve evidence of water, soils, plants and animals. Their survival beneath later till is fortunate, but their stratigraphy must be read cautiously: correlations between sites, climatic episodes and calendar ages are often less exact than older labels may imply.

The Cave Record in the South

For animals around this broad date range, the limestone caves of southern Ireland are central. Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork, produced an exceptional assemblage during excavations conducted between 1904 and 1912. Its name reflects the woolly mammoth remains found there, but the collection also includes bones of reindeer, giant deer, brown bear, wolf, Arctic fox, lemming and spotted hyaena. Caves at Shandon and Ballynamintra in County Waterford, and Foley Cave in County Cork, complement the picture.

These finds demonstrate that a surprisingly broad Ice-Age fauna reached Ireland during the period from at least c. 45,000 to 20,000 years ago. Reindeer are particularly relevant to the cold, open habitats likely around c. 33 ka cal BP. Mammoth and hyaena attest to ecological connections with Britain and continental north-west Europe, while horse and red deer in some southern cave records may indicate locally milder or more varied conditions at other moments in MIS 3. Yet the animals must not be assembled into a single illustrated herd. Individual cave deposits accumulated over long periods, and each species has its own dated range.

Nor were caves neutral sample boxes. Bears and hyaenas could use them as dens; carnivores and scavengers could drag in carcass parts; water, frost, collapse and early excavation could mix material. A cave bone proves that an animal, or part of one, entered the cave system. It does not automatically prove where that animal died, how abundant its species was outside, or whether people hunted it. The re-dating of Irish faunal collections has also shown that improved accelerator radiocarbon methods and bone pretreatment can alter previously accepted ages by several thousand radiocarbon years.

A Reindeer Bone and a Human Question

The most consequential possible evidence for people at this depth of Irish time is a reindeer femur from Castlepook. It has been reported as bearing a deep linear modification interpreted by zooarchaeologist Ruth Carden as a mark made by a sharp stone tool while the bone was fresh. Public accounts have placed the animal at about 33,000 years ago. If the modification is correctly identified as butchery, it indicates that one or more Upper Palaeolithic people handled and processed a reindeer in Ireland many millennia before the better-established post-glacial record.

That is a significant possibility, but it is not a licence to invent a settled hunting people at Castlepook in 31,253 BCE. The femur came from an old collection made before modern excavation standards and without a securely recorded occupation surface. No associated stone-tool assemblage, hearth, dwelling floor, burial, human bone, ornament, art panel or repeated butchery deposit of comparable age has been recovered there. A radiocarbon determination dates the death of the animal, not necessarily the instant of marking, and radiocarbon ages must be calibrated using curves that themselves carry wider uncertainties this far back.

The most defensible conclusion is narrow. Castlepook offers a plausible, potentially transformative indication of a brief human encounter with a reindeer carcass in Ice-Age Ireland. It does not establish permanent population, a named archaeological culture, continuous ancestry or a route by which people arrived. Further securely excavated evidence would be needed to show whether such visitors formed a recurring seasonal presence, an isolated expedition or something else entirely.

Life Beyond the Evidence

Because the human evidence is so limited, political affairs, warfare and diplomacy cannot responsibly be reconstructed. There are no known chiefs, territories, alliances, fortifications or conflicts for Ireland around this point. Even if the Castlepook mark was made by people, it records an act of carcass processing rather than authority, identity or relations between groups. The proper historical answer is not that Ireland was certainly empty of social life, but that the surviving evidence cannot describe it.

The same restraint applies to society and everyday life. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone and organic tools, used fire, shared knowledge, travelled widely and created art. Those wider comparisons make a human visit to Ireland intelligible, but they are not evidence that the same practices left traces at Castlepook. No Irish object from c. 33,200 cal BP presently demonstrates a house, clothing, boat, food store, tool kit or family group. If people were present, their actions were either short-lived, archaeologically slight, later destroyed, or some combination of all three.

There is likewise no direct Irish evidence for religion, formal ritual, visual culture or learning at this date. A cave should not be called a shrine merely because it is a cave, nor should the apparent rarity of human traces be turned into a claim that people lacked beliefs or traditions. Learning would have been

socially transmitted if people visited the island, but its content is beyond recovery. The evidence records animals, sediment and environmental change; it does not record stories, languages or ceremonies.

Economy, Movement and Survival

There was no agriculture, herding, metalwork, market economy or trade network demonstrated in Ireland at this time. The only possible economic action directly suggested by the Castlepook femur is the acquisition or processing of animal tissue. Even that should be stated carefully: a cut-marked bone may show butchery, but it cannot establish whether the reindeer was hunted, scavenged, killed elsewhere or shared among a larger group. Reindeer would have supplied meat, fat, hide, sinew and bone, but these are general possibilities rather than documented Irish products.

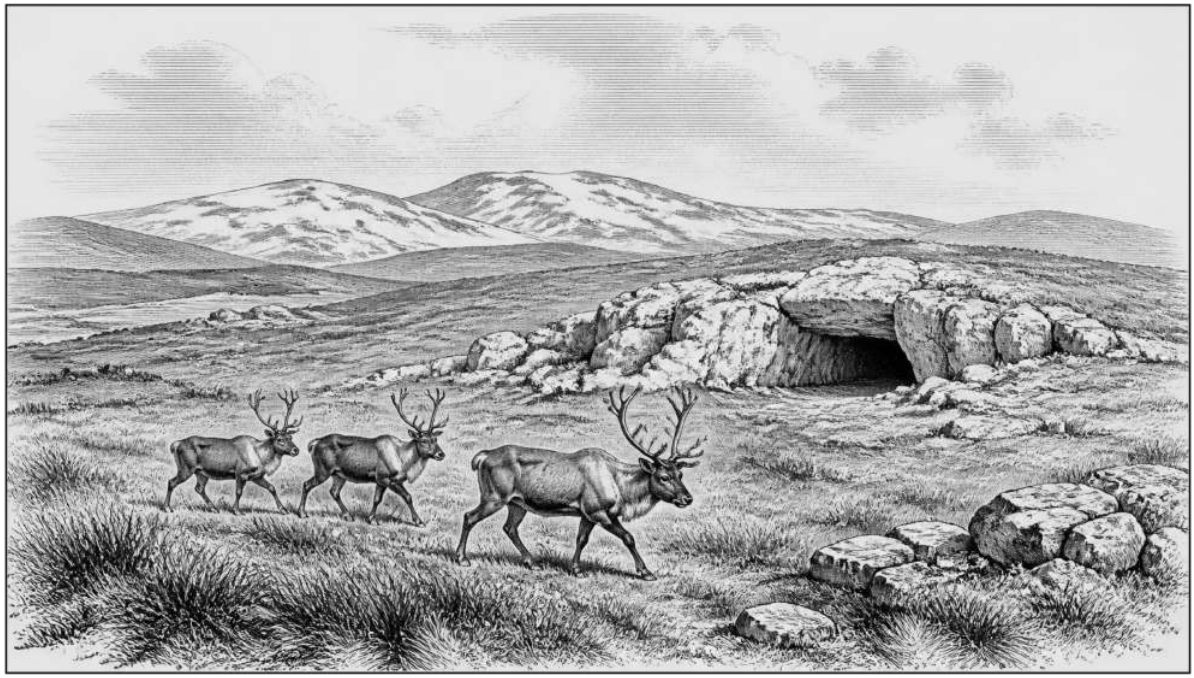
Animal movements are more securely visible than human ones. Reindeer, mammoth and carnivores occupied or passed through landscapes capable of supporting them. Their presence implies ecological corridors across the broader landmass and seasons in which forage, water and shelter were available. It does not mean that every species was common, that their ranges overlapped exactly, or that human groups followed them into Ireland. The key regional development was environmental instability: habitats could expand or contract as temperature, precipitation, sea level and ice margins altered.

In this sense, the history of Ireland around 31,253 BCE is a history of thresholds. Wetland deposits in Fermanagh preserve a landscape later overridden by ice. Southern caves preserve a fauna that later vanished locally or was scattered by climatic change. Castlepook preserves a single possible sign of human action, whose significance exceeds its size but not its evidential limits. The coming millennia would bring greater ice expansion and further loss of accessible evidence. What survives allows a vivid but disciplined view: not a known Irish community, but a cold, dynamic country of open habitats, freshwater pockets, large animals and a tantalising possibility of human presence.

Chapter 049 of 100

31252 BCE

Castlepook’s Palaeolithic Prospect [49]



The label 31,252 BCE is a modern chronological convenience, not a date that can be matched to an Irish annal, ruler, settlement or individual life. No calendar-year precision is available for Ireland at this depth of time. Counting backwards from AD 1950, the label lies roughly 33,200 years before present, but the relevant archaeological and environmental evidence is dated in broad radiocarbon and calibrated ranges, often with uncertainties of centuries or more. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3 (MIS 3), within the Midlandian cold stage, rather than an event in one exact year.

A Country Before Records

Ireland at this time had no known written language, political institutions, named communities or recoverable oral traditions. There is no evidence for kingship, diplomacy, warfare between organised polities, law, monuments, formal religion, farming, trade centres or permanent villages. It would be misleading to manufacture equivalents simply because a year-by-year format usually expects them. What survives instead is a scattered environmental record: cave bones, buried organic sediments, pollen, insects, plant remains, landforms and cave mineral deposits. These sources reveal changing habitats and animals far more clearly than they reveal human lives.

The island’s position also matters. Sea level was much lower than today because vast quantities of water were held in northern ice sheets. Ireland was not necessarily as isolated as it would later become, although coastlines, channels and land connections changed repeatedly as ice and sea level changed. The precise configuration around 33,200 years ago remains difficult to reconstruct locally. A lower sea level might have shortened crossings between Ireland and Britain, but it does not prove that people regularly travelled them, still less that an established population lived on the island.

Castlepook Cave and One Marked Bone

The most arresting evidence relevant to this approximate date comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. The cave produced an important collection of Late Pleistocene animal remains, accumulated over a long period and investigated principally in the early twentieth century. Its fauna includes such cold-stage animals as reindeer, giant deer, brown bear, wolf, fox, lemmings, spotted hyaena and woolly mammoth. These bones show that southern Ireland could, at intervals during MIS 3, support or receive a strikingly varied northern European fauna.

One reindeer femur from the Castlepook collection is particularly significant. County Cork heritage material, drawing on the assessment of zoologist Ruth Carden, identifies a deep surface incision as a cut made by a sharp stone tool while fresh tissue was being removed. The object is broadly placed at about 31,000 BCE. If the mark is correctly interpreted and belongs to the animal’s original death-age, it is possible evidence that a person processed a reindeer in Ireland during the Upper Palaeolithic.

That conclusion must be kept separate from the evidence itself. The femur and its incision are real objects; the human origin of the mark is an expert interpretation. A humanly made cut would demonstrate contact between people and one carcass, not necessarily a successful hunt. The animal could have been scavenged, butchered elsewhere and its remains later carried to the cave by carnivores, water or other natural processes. Castlepook has not yielded a securely associated stone-tool assemblage, hearth, shelter floor, human burial or repeated sequence of occupation from this period. Nor can the bone date a particular season, day or year.

The cave archive requires additional caution because antiquarian excavations pre-dated modern standards of stratigraphic recording, sieving and geoarchaeological sampling. Bone collections may combine material introduced at different times and by different agencies. Later accelerator radiocarbon work has shown that some earlier dates from Irish caves underestimated the true ages of bones by thousands of radiocarbon years. Castlepook is therefore invaluable, but it is not a sealed hunting camp. Its greatest importance lies in raising a difficult and productive question: whether brief Upper Palaeolithic visits to Ireland occurred long before the later, better-established record of settlement.

Reindeer Country

The Castlepook fauna does not describe a single living community frozen in time. Each species, specimen and deposit has its own history. Yet together they make it reasonable to picture parts of Ireland in MIS 3 as open, cold and strongly seasonal. Reindeer are especially suggestive of extensive grazing country. In other parts of Late Pleistocene Europe, reindeer were important prey for mobile hunter-gatherers, providing meat, marrow, hides, sinew, antler and bone. None of those uses can be demonstrated for the specific Castlepook animal beyond the reported incision, but they explain why reindeer would have been a valuable resource for any visiting people.

Large herbivores would have occupied a landscape shared with formidable scavengers and predators. Spotted hyaenas, wolves and foxes could transport, gnaw and scatter bones; caves may have served as dens or places where remains accumulated rather than as human homes. Mammoth and giant deer point to the ecological breadth of the wider cold-stage environment, but they should not be imagined standing together at the cave mouth in one scene. Their dated remains span long intervals, and animal ranges shifted as climates fluctuated.

There is no sound basis for describing an Irish economy in the usual historical sense. No crop cultivation, livestock keeping, metallurgy, pottery, markets or exchange network is known from this era. If humans did reach Ireland, their livelihood would have depended upon mobility, practical stone technology, knowledge of animals and weather, and the capacity to use a short-lived opportunity in a demanding landscape. Any connections with Britain or continental Europe remain hypothetical in the absence of tools, camps or identifiable imported materials.

Wetlands Beneath Later Ice

Evidence from the north adds environmental depth. At Derryvree and nearby sites in County Fermanagh, organic sediments survive between glacial deposits. They have yielded remains including mosses, sedges, bogbean, dwarf shrubs and insects. Their exact correlations and dates have been debated, but they are generally used to illuminate cold phases of MIS 3. Rather than presenting a uniform desert of ice, these buried deposits indicate episodes when freshwater pools, marshy ground and tundra-like vegetation existed within a landscape later overridden or bordered by glacier ice.

The Derryvree evidence is best read as a regional environmental archive, not as a diary of conditions in north Cork or proof that every part of Ireland was simultaneously ice-free. It nevertheless establishes an important point. The advance towards the Last Glacial Maximum was neither simple nor instantaneous. Ice margins fluctuated, and non-glacial habitats could exist during intervening periods. The later maximum expansion of the British-Irish Ice Sheet is generally placed around 27,000–21,000 years before present, while its build-up began after roughly 35,000–32,000 years before present. Ireland around this article’s notional date was therefore approaching a major reorganisation of its climate and landscapes, not yet living in the final full-glacial world.

Crag Cave in County Kerry provides another kind of climatic evidence. Speleothems, the calcite deposits formed by dripping water in caves, grew only when liquid water could penetrate the ground and cave conditions permitted mineral deposition. Uranium-series dating of such formations offers an independent way to study environmental change. It does not supply a weather report for 31,252 BCE, but it reinforces the wider conclusion that the Irish climate of this period was variable rather than permanently static.

People: Possibility, Not Population

The possible Castlepook cut mark must be judged against the very sparse Irish Palaeolithic record. The later cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare is directly dated by two determinations to about 12,810–12,590 and 12,810–12,685 calibrated years before present. That find is widely treated as the earliest secure published evidence for human presence in Ireland. Its reliability does not disprove an earlier Castlepook visit; rather, it defines the difference between a well-dated later indication and a much earlier, more provisional claim from a complex cave collection.

Substantial evidence for enduring post-glacial settlement appears only much later, in the Mesolithic, conventionally from about 8000 BCE. There is no demonstrated continuity between any people who might have visited MIS 3 Ireland and those Mesolithic communities. Later glaciation would have eroded, buried and rearranged much of the earlier landscape, including possible coastal sites now submerged or destroyed. This helps explain the archaeological silence, but it cannot be used as licence to fill the silence with imagined camps, clans or migrations.

For society, culture and belief, restraint is essential. No Irish artwork, ornament, ritual deposit, grave or dwelling can presently be assigned to around 31,252 BCE. Upper Palaeolithic people elsewhere in Europe possessed sophisticated technologies, social relationships and symbolic traditions, but Irish evidence does not allow those practices to be transferred automatically across the sea. At most, the Castlepook femur raises the possibility that people capable of using a sharp lithic edge briefly entered or operated within this northern Atlantic landscape.

An Ice-Age Threshold

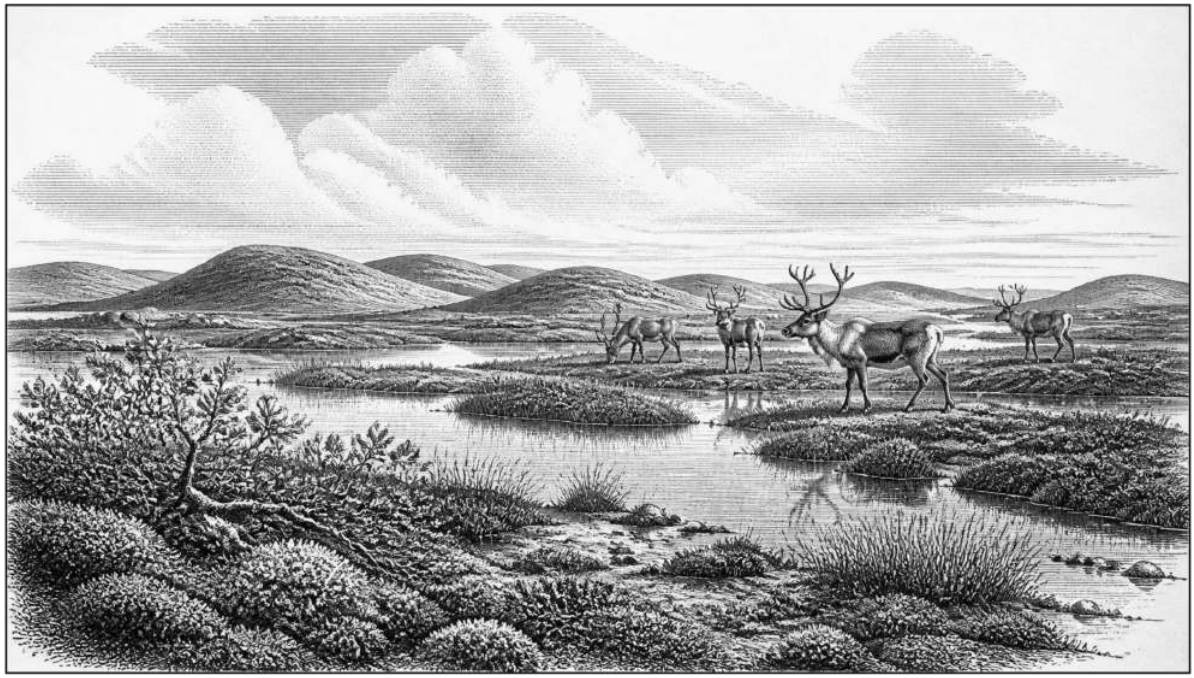
The historical importance of this point lies not in a named event but in the scale of the question it poses. Around the early thirty-second millennium BCE, Ireland was a climatically unstable, seasonally severe and ecologically changing place. Its caves preserve the remains of animals adapted to open cold environments; Fermanagh sediments preserve wetland vegetation and insects between glacial episodes; and a reindeer bone from Castlepook may retain a human-made trace. The evidence supports an Ireland capable of sustaining cold-stage fauna and perhaps receiving small human parties. It does not support a settled nation, a political history or a continuous Palaeolithic population.

That is a slender record, but not an empty one. The marked femur, cave fauna and buried wetlands make this a crucial threshold in Irish deep history: a period in which the island’s potential human past is visible only briefly, before advancing ice and the passage of millennia obscure almost everything else.

Chapter 050 of 100

31251 BCE

Castlepook’s Reindeer Scar [50]



Modern calendar-year precision is not available for Ireland in 31,251 BCE. No Irish community then kept a written calendar, and neither an event nor a person can responsibly be assigned to this numbered year. The label is a modern conversion: it falls roughly 33,200 years before the radiocarbon convention’s present of AD 1950. Archaeologists instead work with probabilities, calibrated date ranges, stratigraphic sequences and environmental proxies. The appropriate setting is the later part of Marine Isotope Stage 3 (MIS 3), a long and climatically volatile interval before the Last Glacial Maximum.

A Landscape Between Advances

The best Irish evidence near this broad timescale is not a settlement but an environmental archive. At Derryvree, near Maguiresbridge in County Fermanagh, roadworks in 1969 cut through a drumlin and revealed organic freshwater silts and fine sands trapped between two thick glacial tills. Till is debris laid down directly by ice. The sequence therefore records three large-scale changes: an earlier phase of glaciation, a subsequent ice-free interval in which water and vegetation accumulated sediment, and a later ice advance that buried and preserved the deposit.

The organic layer produced the radiocarbon determination Birm-166, reported as 30,500 ± 1,100 radiocarbon years BP. Such a result is not equivalent to a calendar date: atmospheric radiocarbon varied substantially in the deep past, so laboratory ages must be calibrated against independently dated records. The uncertainty is also large enough to span many centuries or millennia. Derryvree cannot tell us what occurred in one year, but it securely demonstrates that part of Fermanagh was ice-free during a cold Middle Midlandian interval broadly relevant to 31,251 BCE.

Its plant and insect remains indicate a treeless, wet tundra or muskeg landscape rather than the green, wooded island familiar today. Mosses, sedges, grasses and herbs grew around shallow water and saturated ground; aquatic plants show that pools and sluggish freshwater existed locally. Mountain-avens, dwarf willow, bogbean and other cold-tolerant taxa point to a periglacial climate, where frost processes shaped the ground even outside the margins of an ice sheet. This was not necessarily a uniform Irish scene. Sheltered hollows, spring-fed watercourses, exposed uplands and limestone country could offer very different conditions within relatively short distances.

Climate, Ice and Changing Coasts

MIS 3 was neither a single unbroken freeze nor a stable warm phase. North Atlantic climates swung repeatedly between colder stadials and relatively milder interstadials. Ireland’s surviving evidence is too sparse to assign Derryvree confidently to a particular short-lived Greenland climate event, yet the freshwater sediments are important precisely because they interrupt a glacial sequence. Speleothems in Crag Cave, County Kerry, formed episodically during parts of MIS 3, independently showing that liquid water percolated through limestone in some milder intervals. Derryvree and Crag Cave should not be treated as identical local climates, but together they caution against imagining Ireland as permanently ice-covered at this date.

At the same time, the direction of change was ominous. The British–Irish Ice Sheet was growing through the period from about 31,000 years ago towards its greatest overall extent around 26,000 years ago. Later ice advances would remodel huge areas, eroding older soils and archaeological surfaces, transporting deposits and burying others beneath till. That destructive history is a major reason why evidence for very early people in Ireland is so exceptionally slight. Absence of camps, hearths and tools cannot simply be read as absence of people; but neither can the likelihood of lost evidence be used to create an unseen settled population.

Sea level was much lower globally than today, and the outlines of the Irish landmass and its surrounding plains differed greatly from modern coastlines. Yet the exact availability of a walkable route, a sea crossing or a shifting mixture of land, ice and water for any particular moment remains uncertain. It is safest to say that movement between Ireland, Britain and north-western Europe was conditioned by changing ice margins, coastlines, rivers and animal ranges. No surviving Irish artefact of this age maps a route, identifies an origin point or demonstrates an exchange network.

Castlepook’s Difficult Evidence

The most arresting object connected with this broad era comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. The cave’s early twentieth-century excavations recovered a rich collection of Ice Age animal remains. Reassessment and improved radiocarbon methods have made Castlepook central to study of Ireland’s MIS 3 fauna, while also exposing the limitations of old collections. The original excavators worked before modern standards of layer-by-layer recording, systematic sieving, sediment analysis and accelerator radiocarbon dating. A bone labelled from the cave is valuable evidence, but seldom a securely located fragment of a single occupation surface.

Among the collection is a reindeer femur carrying a deep linear scar. Ruth Carden has interpreted the mark as damage made by a sharp stone tool during the processing of fresh bone. County Cork heritage material places the bone broadly at about 31,000 BC, making it especially close to the chronological

horizon represented by this article. If the interpretation is sustained, it is potentially the earliest evidence that people handled an animal in Ireland. It would be a remarkable extension of the island's known human story beyond the much later, securely documented Mesolithic record.

But the claim must be described exactly. A dated animal bone establishes an age range for the animal's death, not an exact date for a mark. Identifying a cut or chop mark requires taphonomic judgement: specialists must distinguish it from carnivore gnawing, trampling, weathering, sediment abrasion, breakage and damage during excavation or storage. Furthermore, Castlepook is a cave archive accumulated over long periods. Carnivores can carry carcass parts into caves; water and gravity can rearrange material. A marked limb bone does not prove that people killed the reindeer at the cave, camped there, or even entered the chamber from which it was recovered.

No securely associated stone-tool assemblage, fireplace, dwelling floor, burial, personal ornament, art or human bone has yet demonstrated a resident Irish community around 33,200 years ago. Recent licensed excavation at Castlepook has sought surviving deposits that may permit more decisive contextual study. Until such evidence is published, the femur is best treated as a narrow but important indication of possible Upper Palaeolithic carcass processing, not as proof of permanent settlement or a named first population.

Animals in an Open Country

Even where people remain uncertain, the animal record shows that Ireland could support a very different late-Pleistocene fauna at intervals. Castlepook has yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, mountain hare, lemmings and spotted hyaena. Not every species need have occupied the same valley, season or generation: cave collections can combine remains accumulated over thousands of years. Nonetheless, the assemblage confirms that cold-adapted animals and large herbivores reached southern Ireland during MIS 3.

Reindeer are particularly evocative because their movements could link food, terrain and possible human travel. In an open landscape they might have provided meat, fat, marrow, hide, sinew, bone and antler. If the Castlepook scar is anthropogenic, it shows only that a sharp lithic edge was used on one carcass. It cannot disclose whether the animal was hunted, scavenged, butchered elsewhere or divided among several people. Nor can it determine the season, the group's size, the type of tool, clothing, language or destination. 'Reindeer hunters' is a plausible working model, not a fact inscribed on the bone.

Predators matter as much as prey. Spotted hyaena remains and coprolites at Castlepook strongly suggest use of the cave as a carnivore den during part of its history. Hyaenas, wolves and bears could compete for carcasses, carry bones into shelter and alter them after death. This is one reason a cave bone is both informative and difficult. The same processes that preserved evidence of extinct animals can disconnect it from the place where an animal died or was initially processed.

No Politics, No Proven Religion

There is no evidence from Ireland around this horizon for chiefs, kingdoms, territorial borders, diplomacy, organised warfare or political institutions. Nor is there a basis for reconstructing a local religion, burial rite, art style, language, school of learning or oral tradition. Upper Palaeolithic peoples elsewhere in Europe made sophisticated tools, used fire, tailored clothing and participated in wide social networks; some produced striking art and ornaments. Those comparisons demonstrate human capacities, but they are not Irish evidence. Importing continental cave art or later Celtic mythology into the Derryvree and Castlepook record would replace archaeology with fantasy.

Similarly, there was no farming, pottery, metalworking, town, monument or trade system demonstrable in Ireland at this time. If people did make brief visits, their economy would have been one of mobile foraging and opportunistic use of animal and plant resources. That inference rests on the ecology of the period and the possible bone modification, not on an excavated camp. The practical knowledge needed to move safely through exposed country—reading weather, finding water, tracking animals and perhaps navigating ice-free corridors—would have been substantial, but it cannot be translated into a detailed Irish social history.

What the Evidence Allows

For 31,251 BCE, Ireland offers a history of traces rather than annals. Derryvree preserves wet, treeless ground during an ice-free cold interval; Castlepook preserves a complex fauna and a reindeer femur whose scar may record human action. Both sites also teach restraint. Dates have ranges, deposits have histories, and an animal remain is not automatically a settlement. The most responsible picture is of a climatically unstable Irish landscape, periodically able to sustain tundra vegetation and Ice Age mammals, on the eve of more extensive glaciation. Whether a small human party briefly crossed it remains one of the most important, promising and unresolved questions in Irish prehistory.

Chapter 051 of 100

31250 BCE

Derryvree and the Reindeer [51]



“31,250 BCE” is a modern chronological label, not a year that can be recovered from Ireland’s archaeological record. No written calendar existed, and the evidence available is dated in radiocarbon years, calibrated ranges and relative sequences of sediment. The most responsible frame is the later part of Marine Isotope Stage 3 (MIS 3), a highly variable phase of the last Ice Age. The nominal date falls about 33,200 calendar years before AD 1950, but that arithmetic must not be confused with a dated event. What can be described is an Irish environment changing over millennia, together with a small and exceptionally important body of animal and possible human evidence.

An Ice-Age Interval

Ireland at this point was not the familiar green, wooded island of later millennia. It belonged to the Midlandian cold stage, before the Last Glacial Maximum reached its fullest extent. Conditions shifted sharply during MIS 3: colder phases encouraged ice growth, while relatively milder interstadials allowed ice margins to retreat or thin locally. These changes were neither uniform across the island nor conveniently measurable to a particular season in 31,250 BCE. Coastlines, rivers, exposed ground and routes between Ireland and Britain also differed greatly from those of today because so much water was locked in continental ice sheets and sea level was lower.

The crucial qualification is that cold did not mean that every part of Ireland was continuously buried beneath glacier ice. Geological evidence records a patchwork of ice, periglacial ground, lakes, wet hollows and open vegetation at different times. Conversely, an ice-free locality does not demonstrate a wholly ice-free island. The broad picture is of a north-western European landmass at the edge of climatic

possibility: exposed to Atlantic weather, seasonal snow, frozen or waterlogged soils, powerful winds and repeated environmental disruption. Any people or animals moving through it faced a landscape whose resources and hazards could change profoundly between generations.

Derryvree’s Buried Wetland

The best Irish environmental evidence close to this nominal date comes from Derryvree near Maguiresbridge in County Fermanagh. Roadworks exposed a sequence through a drumlin: lower glacial till, then freshwater sands, silts and organic mud, followed by later glacial deposits. Till is unsorted material laid down by ice. The order of these layers is strong evidence that a glacier had occupied the area, that an intervening ice-free episode permitted water and plants to accumulate, and that a subsequent advance sealed the wetland beneath fresh ice-borne sediment.

Organic material from this inter-till deposit, laboratory sample BIRM-166, produced a conventional radiocarbon age of 30,500 radiocarbon years BP, with an uncertainty of roughly a millennium. Radiocarbon years are not calendar years: atmospheric carbon-14 levels varied, so laboratory results must be calibrated using internationally maintained curves. Published recalibrations place the determination broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The requested year lies inside that wide span. It cannot be assigned to a particular layer, plant, animal or episode of pond formation.

The Derryvree fossils nevertheless give unusually vivid evidence of the kind of locality that existed during part of this interval. Plant macrofossils and insect remains indicate cold, open tundra-like vegetation and freshwater conditions. Mosses, sedges, bogbean, dwarf willow, mountain-avens, clubmoss and other hardy plants point to damp ground around pools or sluggish water rather than forest. The assemblage does not license a claim that the entire island was a single uniform tundra. It does show that, at Derryvree, a functioning wetland community developed between glacial episodes. In such a setting, summer growth, standing water and vegetation could have supported insects, birds and grazing animals, while winter imposed much harsher constraints.

Reindeer Country in North Cork

In north County Cork, Castlepook Cave near Doneraile offers a different sort of archive. Excavated principally in the early twentieth century by Richard J. Ussher and colleagues, it yielded a very large collection of Ice-Age animal bones. Later radiocarbon work, including improved methods for preparing bone samples, showed that the cave fauna covers a much longer period than older dates had suggested. Individual finds represent repeated accumulation over tens of thousands of years, rather than one community or one occupation.

The fauna demonstrates that animals capable of living in cold, open country reached Ireland during MIS 3. Castlepook has produced remains identified as reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These animals did not necessarily all occupy the district together, and their presence in a cave need not mean that they lived in the cave. Carnivores could have used its galleries as dens and brought in carcass remains; water, sediment movement and later digging could mix material from different dates. Even so, the range of species is important evidence that Ireland was connected to wider north-west European ecological movements before the severe conditions of the Last Glacial Maximum restricted or eliminated many local populations.

Reindeer are especially relevant. Herd animals move across broad territories in response to pasture, snow cover and season, and a treeless, herb-rich landscape could provide their forage. That does not prove a predictable annual migration route through the Awbeg valley, nor does it tell us how many animals were present in any one year. But it makes the Doneraile area a plausible part of a mobile grazing landscape. Predators and scavengers, including hyaenas and wolves, would have followed opportunities created by such animals. The cave's bone record is therefore evidence of ecological relationships, not a census of an Ice-Age menagerie.

A Possible Human Trace

One reindeer femur from Castlepook has transformed discussion of early Ireland. County Cork heritage material dates it broadly to c. 31,000 BCE and describes a deep surface incision identified by zooarchaeologist Ruth Carden as a mark made by a sharp stone tool during butchery. If that reading is correct, it is evidence that a person or small group processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the long-recognised post-glacial settlement record.

Its significance is considerable, but its limits must remain equally clear. The femur was recovered from an antiquarian cave collection, not from a newly excavated, intact living floor with associated tools, hearths and food waste. A date on the bone establishes the age of the animal's remains; it does not independently date the incision, identify its maker, locate the kill, or reveal how long people stayed. No securely associated Palaeolithic stone-tool assemblage, dwelling, burial, human skeleton, hearth or repeated occupation surface of comparable age has yet been found in Ireland. The most cautious interpretation is therefore brief human activity, possibly carcass processing by travelling hunters, rather than proof of permanent settlement or a continuously occupied island.

Life Beyond the Evidence

That restraint matters when considering society. There is no evidence from Ireland around this date for named communities, leaders, territories, law, diplomacy or organised warfare. It would be misleading to turn a possible butchery mark into a tribe, a political boundary or a campaign. Nor can Irish evidence reveal language, kinship systems, gender roles, childhood, teaching, artistic practice or religious belief. Upper Palaeolithic communities elsewhere in Europe made sophisticated tools, ornaments and images, but those achievements cannot be transferred automatically to Ireland in the absence of Irish finds.

The same is true of economy and exchange. There were no farms, cereal fields, livestock herds, villages, metal objects or known trade networks. If hunters were present, their subsistence may have involved a flexible use of animal resources, especially meat, marrow, hide, sinew and bone, but Castlepook directly supports only the much narrower proposition that a reindeer bone may have been cut with a stone implement. A cave used by carnivores should not be imagined as a human home merely because a modified bone was found among its deposits.

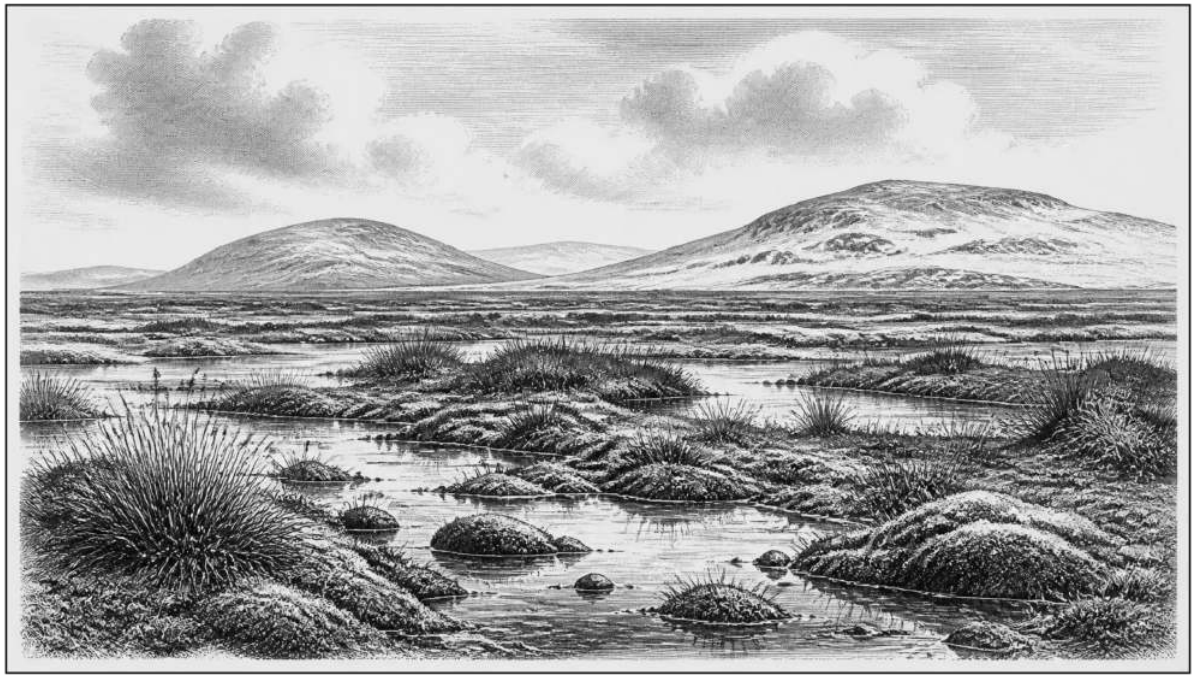
The most important development illuminated by 31,250 BCE is thus not a political event but a question of survival and movement. Derryvree preserves an ice-free wetland interval in Fermanagh; Castlepook preserves a rich southern fauna and a potentially momentous sign of human butchery. Together they replace the old, simple image of an Ireland either empty or wholly ice-covered. They instead reveal a changing Ice-Age landscape in which animal populations entered and disappeared, local

wetlands briefly flourished between glacial advances, and human visitors may have reached the island. The evidence is fragmentary, but it is precisely this fragmentary quality that defines Ireland’s deep prehistory at this date.

Chapter 052 of 100

31249 BCE

Crag Cave’s Thaw Pulses [52]



“31,249 BCE” is a useful modern filing label, not a date at which an event in Ireland can be placed. No writing, named community, annual deposit or human calendar survives from this depth of time. In relation to the radiocarbon convention of AD 1950, the number points broadly to about 33,200 calendar years ago, within the later part of Marine Isotope Stage 3 (MIS 3), during the Midlandian cold stage of the Irish Pleistocene. That apparent precision is misleading. The evidence is dated in wide calibrated ranges, and the landscape could alter profoundly over centuries or millennia. A responsible account therefore describes an archaeological and environmental horizon around the requested year, rather than inventing a day, a ruler or a human episode.

A Changing Cold-Stage Island

Ireland at this time was not the familiar green, wooded island of later millennia. It lay within the highly variable climate of the last glacial cycle. Conditions across the North Atlantic shifted repeatedly between colder stadials and relatively milder interstadials. Ice, permafrost, meltwater, bare ground and sparse vegetation each expanded or contracted in response. The Last Glacial Maximum, when the British–Irish Ice Sheet became much more extensive, still lay ahead; its peak is generally placed many thousands of years later, around 27,000–23,000 calibrated years BP. Yet this does not mean that Ireland was uniformly hospitable or ice-free in 31,249 BCE. Upland ice and glaciers existed in parts of the island during the broader period, while local conditions varied sharply with altitude, latitude, season and the advancing or retreating margins of ice.

The most important point is instability. Modern reconstructions of the British–Irish Ice Sheet show rapid growth during the late glacial cycle, but they also underline the limits of a single map or a single date. An ice margin is not a fixed frontier; its position can change, and an apparently open district may be

separated from another by ice, waterlogged ground or severe cold. At this time Ireland should be envisaged as a northern Atlantic landscape in transition, not as either a wholly frozen wasteland or a permanently temperate refuge.

Derryvree Between the Tills

The closest Irish environmental archive for this broad chronological neighbourhood lies at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a drumlin containing freshwater silts and fine sands between two separate layers of till, the unsorted debris left by glacier ice. This sequence is unusually valuable because it preserves an order of events. First, ice deposited the lower till. Later, in a locality free of overriding ice, water accumulated sediment and organic remains. A subsequent glacial advance laid down the upper till and sealed the older freshwater deposit.

Material from the Derryvree organic bed produced the conventional radiocarbon determination Birm-166, about 30,500 radiocarbon years BP with a large laboratory uncertainty. Radiocarbon ages are not calendar ages: atmospheric carbon levels changed through time, so results must be calibrated against independently built curves. Calibration produces broad probability ranges rather than a single historical year. The Derryvree result has commonly been treated as overlapping an interval of roughly 37,000–32,000 calibrated years BP. Thus 31,249 BCE falls within the deposit’s very broad chronological vicinity, but cannot be identified as the moment when any particular Derryvree plant grew, a pool froze or sediment was buried.

The preserved plant and small-animal evidence points to a cold, largely treeless wetland landscape, often described as muskeg or tundra-like. Mosses, sedges, aquatic plants and herbs could exploit sheltered, waterlogged ground during a short growing season. Such evidence is direct testimony to a particular Fermanagh locality, not a complete map of Ireland. It does, however, show that parts of the island supported freshwater habitats and vegetation between glacial episodes. Even in a harsh climate, the country contained ecological variety: pools, damp hollows, mineral sediments, exposed ground and likely more sheltered patches beside them.

Crag Cave and Climatic Pulses

Crag Cave in County Kerry supplies a different kind of evidence. Uranium-series dates on broken and reworked cave calcite show episodes of speleothem growth through much of the last glacial period, including the latter part of MIS 3. In a shallow cave system, dripstone growth requires liquid water percolating through ground above the cave. Researchers therefore interpret phases of deposition as signs that conditions in south-west Ireland periodically became mild enough for seasonal or longer-lived thaw, soil activity and infiltration; lengthy breaks in growth indicate colder conditions, potentially involving continuous frozen ground.

This does not allow historians to announce a thaw in 31,249 BCE. The dated material gives intervals and climatic patterns, not an annual weather record. Its significance is broader: Ireland responded to abrupt North Atlantic climate change. Derryvree’s wetland and Crag Cave’s calcite are complementary archives. One preserves a cold freshwater ecosystem between tills; the other records that the southern karst landscape experienced episodic conditions permitting water to move through soils and rock. Together they rebut the simple image of an unchanging ice-bound island.

Animals on the Limestone Country

Faunal remains from Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork provide the strongest evidence that larger animals reached Ireland during MIS 3. The cave collection includes reindeer, mammoth, giant deer, spotted hyena and other cold-stage animals; Arctic fox, wolf and lemmings occur in the wider southern Irish cave record. The National Museum of Ireland identifies Castlepook as the country’s most important site for mammal remains from the last cold stage. These animals imply open habitats capable, at least at particular times, of sustaining grazing herds and large predators.

But the cave bones must not be made to tell more than they can. Much of the material was excavated early in the twentieth century, before modern recovery and recording standards. Bones came from complicated deposits, and later re-dating has shown that several older radiocarbon results required revision. Not every specimen need be exactly contemporary with every other one, and a cave could accumulate remains through predator activity, natural deaths, water movement and changing use over long periods. The scientifically defensible conclusion is that a varied cold-climate fauna occupied or reached Ireland during MIS 3, not that a neatly reconstructed herd crossed a particular valley in this notional year.

The Castlepook Human Question

A reindeer femur from Castlepook has made this period especially important in Irish archaeology. It has been reported as dating to about 31,000 BCE and as carrying a deep mark interpreted by palaeozoologist Ruth Carden as having been made with a stone tool while fresh bone was butchered. If that interpretation is confirmed, it would be evidence that people handled a reindeer in Ireland far earlier than the previously accepted terminal-Pleistocene evidence from County Clare.

Its importance demands caution, rather than certainty. The femur is a single object from an old cave collection, not part of a securely excavated camp containing a hearth, stone-tool assemblage, dwelling floor, food-preparation area or burial. The National Museum of Ireland still states that no clear evidence of Palaeolithic human presence has emerged. These positions are not irreconcilable: the bone is a serious and potentially transformative indication of human activity, while the evidence for resident, continuous settlement remains unproven. It cannot establish population size, ancestry, language, kinship, seasonal routine or a permanent occupation of the island.

Society Beyond Recovery

There is consequently no responsible basis for describing political affairs, diplomacy or organised conflict in Ireland around 31,249 BCE. No chiefs, territories, alliances, weapons caches or defensive sites are known. Nor is there evidence for farming, herding, pottery, metalwork, built villages, formal trade routes or permanent maritime communities. If people did visit, comparison with Upper Palaeolithic groups elsewhere in north-west Europe makes small, mobile hunting parties a plausible possibility, perhaps drawn by animal resources. Yet that is an inference from neighbouring regions, not a demonstrated Irish social system.

The same boundary applies to religion, culture and learning. Ireland has no securely dated cave art, portable art, burial or ritual structure from this horizon. A cave’s later importance to people cannot be projected backwards onto its Ice Age deposits. The material record preserves plants, sediment, calcite and animal bones; it is silent about songs, stories, beliefs and names. Rather than treating that silence as an invitation to invention, it is part of the history: later ice movement, erosion, rising seas and the scarcity of occupation traces have left an exceptionally fragmentary archive.

Routes, Water and Regional Change

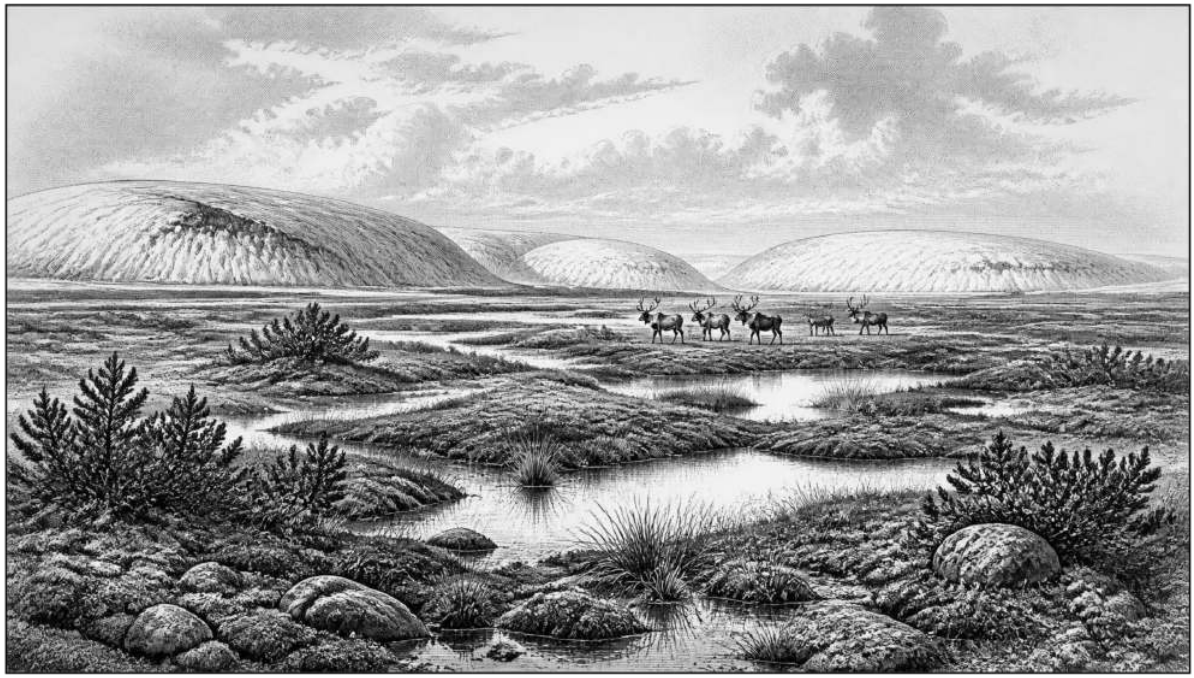
Lower global sea levels altered the geography around Ireland, exposing areas that are now seabed. Nonetheless, claims of a simple, permanent land bridge to Britain or continental Europe are disputed. Sea level, local crustal movement, ice loading and the shape of channels all mattered, and the best-known reconstructions concentrate on later phases of the glacial cycle. For 31,249 BCE, it is safer to say that regional distances and coastlines differed markedly from those of today, and that animal or human movement depended on shifting land, water and ice conditions. The presence of cold-stage mammals confirms that ecological connections existed at some stage; it does not by itself reveal the exact route, season or frequency of crossings.

The enduring development around this date was therefore environmental rather than political: Ireland formed part of a volatile north-west European glacial world. Fermanagh’s buried wetland demonstrates an ice-free interval and a sparse but living freshwater landscape. Kerry’s cave calcite registers climatic ameliorations and renewed freezing. Cork’s cave fauna records large mammals adapted to open country, while one marked reindeer bone poses an unresolved question about people. Those traces do not yield a conventional year in Irish history. They do reveal why the deep past of the island is a matter of changing ice, water, animal movement and carefully tested evidence.

Chapter 053 of 100

31248 BCE

Derryvree’s Trifoliate Record [53]



Modern calendar-year precision is not available for Ireland in 31,248 BCE. Nobody on the island recorded time in numbered years, and neither radiocarbon dating nor glacial stratigraphy can identify an event within a particular twelve-month span so far back. In the archaeological convention of years before AD 1950, the label falls roughly 33,200 years before present, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a cold and highly variable phase of the last Ice Age. The appropriate subject is therefore not an invented annual chronicle, but the fragmentary environmental and archaeological evidence that can illuminate Ireland across a broad interval surrounding this notional date.

A Date Within a Deep Range

The strongest chronological warning comes from the nature of the evidence itself. A radiocarbon determination measures the remaining carbon-14 in once-living material, not a modern calendar date. Calibration is needed because atmospheric carbon-14 levels changed over time; at great age, the calibration process and the uncertainty of the original measurement yield ranges of centuries or millennia. Geological deposits also establish sequence especially well—what lay beneath, above, or between other deposits—but not a diary-like date for each layer.

For 31,248 BCE, the most useful Irish anchor is the Derryvree site near Maguiresbridge in County Fermanagh. Road excavations in 1969 cut through a drumlin, exposing freshwater silts and fine sands enclosed between two substantial tills: unsorted sediment deposited by glacier ice. Organic material in the intervening deposit produced the radiocarbon date BIRM-166, 30,500 +1,170/-1,030 radiocarbon years

BP. Later discussion calibrates this broadly to about 36,900–31,700 calendar years BP, approximately 34,950–29,750 BCE. The numbered year considered here lies within that wide span. It cannot be assigned to a particular pool, plant, animal or human act in the Derryvree sequence.

The order of the deposits is nevertheless exceptionally important. An earlier glacier formed the lower till; during a subsequent non-glacial interval, water and sediment accumulated in a low place; a later advance laid down the upper till and sealed the freshwater record. Derryvree consequently demonstrates that this part of Fermanagh experienced conditions capable of sustaining freshwater habitats during a cold interval before renewed glaciation. It does not prove that all of Ireland was ice-free at the same time, or that conditions across the island were uniform.

Wet Tundra Under a Harsh Sky

The Derryvree sediments preserve pollen, plant macrofossils, mosses and insect remains. Their combined evidence supports an open, largely treeless tundra or muskeg-like landscape: waterlogged ground, shallow pools, mossy margins and plant-rich sedge beds, set amid sparse dry-ground vegetation. Grasses, sedges, herbs, juniper and cold-adapted mosses are more appropriate images than the oak woods, hedged fields and pasture often associated with later Ireland. A seed of bogbean, *Menyanthes trifoliata*, is especially evocative evidence for freshwater vegetation in this severe setting.

These remains are evidence for local ecology, not a complete reconstruction of a whole island. Pollen may travel, material may be reworked, and a sedimentary hollow naturally records its immediate catchment more fully than distant uplands or coasts. Even so, the agreement between several kinds of fossil evidence makes the broad interpretation persuasive: south Fermanagh contained cold, open ground with wet hollows and standing water during part of MIS 3. Winters were severe, summers short, and plant growth seasonal. Such a terrain would have altered rapidly as snow cover, frost, meltwater and the edge of nearby ice changed.

MIS 3 was not one unbroken climatic state. Greenland ice-core records show abrupt shifts between relatively milder interstadials and colder stadials, often on timescales far shorter than conventional archaeological periods. Ireland’s record is too discontinuous to match every such shift securely to a particular locality. Yet the Derryvree deposits make the larger point clear: Late Pleistocene Ireland was environmentally dynamic. Its rivers, wetlands, vegetation and animal habitats responded to changes in temperature and precipitation, while glaciers repeatedly advanced, retreated or reorganised.

Ice, Sea and Regional Difference

At around 33,200 years before present, Ireland was approaching the greatest expansion of the last British–Irish Ice Sheet, but it should not be pictured simply as an island either wholly frozen or wholly open. Evidence from Derryvree records an ice-free episode in Fermanagh within a broad date range. Other research, particularly from western Ireland and the offshore shelf, indicates that ice-sheet behaviour before the Last Glacial Maximum was more complicated than older single-advance models allowed. Some reconstructions infer extensive ice or high relative sea level in western sectors during parts of the 40,000–19,000 calendar-year-BP interval; other evidence places the maximum later and shows pronounced regional variation.

The responsible conclusion is uncertainty with boundaries. Ice was a major force in the Irish landscape, and its expansion would later cover or reshape large areas, eroding older surfaces and making survival of sites exceptionally unlikely. But Derryvree shows that ice-free freshwater environments

existed at least locally during the broader period. The Last Glacial Maximum proper came later, conventionally placed around 26,000–20,000 years BP, though the timing and extent of its Irish margins remain matters of active reconstruction.

Lower global sea levels exposed land now beneath the surrounding seas, changing coastlines and the scale of coastal plains. This did not make movement into Ireland straightforward or demonstrable. No secure route, crossing point or contemporary shoreline camp has been found for this date. Much potential evidence may lie beneath later marine deposits, beneath glacial sediment, or may have been destroyed by erosion. Geography made connections with Britain and continental north-west Europe environmentally possible in changing ways; archaeology has not yet documented how, or even how often, people may have made them.

Cave Fauna and One Human Question

County Cork provides the most striking evidence relevant to possible human activity. Castlepook Cave, near Doneraile and also known as Mammoth Cave, has yielded a rich Pleistocene faunal collection. The assemblage includes animals associated with cold and open environments, among them reindeer, woolly mammoth, giant deer, brown bear, hyaena, wolf, Arctic fox, lemmings, stoat and mountain hare. The cave record shows that Ireland was not biologically empty before the full glacial maximum. It was occupied, intermittently and unevenly, by a changing community of large herbivores, predators and smaller cold-adapted animals.

That list must not be turned into a single illustrated scene. Cave deposits frequently accumulate over long periods. Carnivores can drag in bones; water, frost, collapse, excavation and museum collecting can disturb their original positions. The Castlepook animals need not all have lived together, and their remains do not identify an unchanging local ecosystem. The cave was probably used differently by animals at different times: as a shelter, den, scavenging place or trap-like accumulation point. Mammoth and hyaena remains, in particular, underline how unlike later historic Ireland this Ice Age fauna was.

A reindeer femur from the older Castlepook collection is central to the question of people. It bears a deep linear mark interpreted by palaeozoologist Ruth Carden as having been made on fresh bone with a sharp stone tool during carcass processing. County Cork heritage material has presented the specimen as dating to about 31,000 BC. If that interpretation and association are sustained, it would indicate that people handled a reindeer in Ireland during the Upper Palaeolithic—far earlier than the long-established evidence for human presence after the final glacial retreat.

The limits of that claim are as important as its excitement. The bone comes from an old cave collection, not from a modern excavation yielding a securely recorded occupation floor. No associated hearth, stone-tool assemblage, dwelling, human burial, artwork or repeated food-processing deposit has yet been published for Ireland at this age. A date on the animal establishes when it lived, not automatically when the mark was made or whether people killed it, found it dead, took meat or sinew, or worked the limb elsewhere before carnivores moved it. The marked femur is possible evidence of a brief visit or carcass processing episode, not proof of permanent settlement.

Lives Beyond the Record

There is consequently no evidence for political affairs, diplomacy, named groups, leaders, territorial boundaries, organised warfare, religion or formal learning in Ireland at this point. There is also no basis for asserting farming, herding, pottery, monuments, villages, trade routes or an established population.

These absences are meaningful, but they partly reflect preservation: later ice was destructive, and mobile people leave smaller archaeological signatures than farming communities.

If people did reach Ireland, comparison with Upper Palaeolithic groups elsewhere in Europe suggests only possibilities, not Irish facts. Such communities could make sophisticated stone tools, manage fire, prepare hides, travel widely and maintain social connections across large territories. None of those capacities can be assigned to an Irish group from the Castlepook femur alone. The modest inference is that a human-made cut, if confirmed, would require a sharp implement and knowledge of carcass processing. It would say nothing secure about language, belief, kinship, population size or duration of residence.

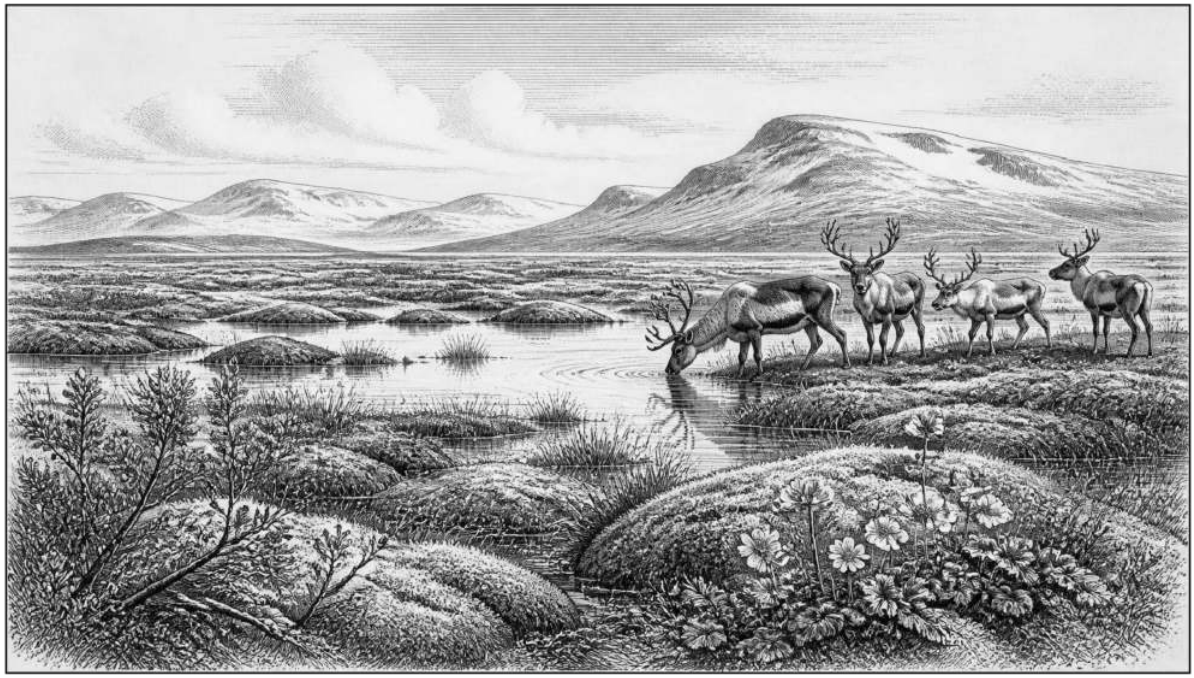
The economy most securely visible at 31,248 BCE is ecological rather than human: plants exploiting brief growing seasons; insects and small mammals inhabiting wet tundra; herbivores moving through open country; predators and scavengers using caves and carcasses; and meltwater building silts in sheltered basins. Derryvree's bogbean seed and Castlepook's reindeer bone are small survivals from that wider system. Together they reveal an Ireland that was cold, regionally varied and repeatedly transformed by ice—an inhabited landscape in the biological sense, but not yet a historically legible society.

For this distant date, then, the most honest annual overview is a lesson in scale. The evidence permits a carefully drawn environmental world and a tantalising question about human visitation. It does not permit a story of "the Irish" in a particular year. The deep record is richest where it remains most humble: a wetland sealed beneath a Fermanagh drumlin, a cave bone from north Cork, and the recognition that both ice and time have removed far more than they left behind.

Chapter 054 of 100

31247 BCE

BIRM-166’s Radiocarbon Interval [54]



Modern calendar-year precision is not available for Ireland at this depth of time. “31,247 BCE” is a modern back-calculation, equivalent to roughly 33,197 calendar years before AD 1950, not a year that anyone in Ireland recorded or that archaeology can isolate. The responsible subject is therefore a broad Late Pleistocene interval within Marine Isotope Stage 3 (MIS 3), when climate repeatedly changed between relatively milder interstadials and severe cold phases. Radiocarbon determinations, sediment layers and fossil assemblages can locate Irish evidence within ranges of centuries or millennia; they cannot identify an event on a particular day, season or calendar year.

A Date Within a Cold Phase

The most informative Irish evidence near this notional date comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed an exceptional sequence: one mass of glacial till below, freshwater silts and fine sands with organic material in the middle, and a second till above. This was not a settlement layer. It was a natural archive, formed when an earlier ice advance had retreated or ceased to dominate locally, allowing water, sediment, plants and insects to gather in a wet hollow before a later glacier buried the deposit.

Organic material from the freshwater bed returned the radiocarbon determination BIRM-166, conventionally dated to 30,500 radiocarbon years before present, with a substantial uncertainty of approximately a millennium either way. Radiocarbon years are not calendar years: the amount of atmospheric carbon-14 has altered through time, and measurements must be calibrated against independently constructed curves. Published calibrations place the Derryvree evidence broadly in the later

part of MIS 3, with ranges extending across the general vicinity of this article’s modern numerical label. That overlap is important, but limited. It permits Derryvree to illuminate the landscape around 31,247 BCE; it does not prove that every plant, beetle or pool survived in that exact year.

The terminology itself needs care. Earlier Irish Quaternary schemes called this interval the Derryvree Cold Phase or placed it within the Midlandian glaciation. Current research commonly uses the international MIS framework and increasingly tests older regional models against improved ice-sheet chronologies. The central conclusion remains secure: parts of Ireland could be ice-free during phases before the Last Glacial Maximum, but conditions were cold, unstable and increasingly shaped by the growth of the British–Irish Ice Sheet. The later maximum, reached after this period, was far more extensive and reworked or removed much older evidence.

Wet Tundra Beneath the Drumlin

Derryvree gives an unusually detailed environmental picture. The silts, sands, pollen, plant macrofossils, mosses and insects indicate open tundra rather than woodland. Grasses, sedges, herbs, juniper and cold-adapted plants grew in a landscape with sparse dry-ground cover. Mossy ground surrounded shallow freshwater pools rich in decaying plant material. Finds including mountain-avens, dwarf willow and bogbean demonstrate that this was not a lifeless frozen waste. It was a patchwork of wetland, exposed mineral ground and low vegetation, productive during the brief growing season but subject to long, hard winters and periglacial processes.

Such evidence also corrects misleading modern images of Ireland. There were no blanket oak woods, enclosed green fields, peat-cuttings, towns or familiar coastlines. A drumlin did not yet have its modern agricultural setting; it was part of an active glacial and periglacial terrain. Frost action could disturb soil, seasonal thaw could feed pools and small watercourses, and wind could move sediment across sparsely vegetated ground. The local freshwater record establishes that liquid water and plant life existed at Derryvree during its depositional interval. It cannot, by itself, map every valley, coast or upland across the island.

Nor should an ice-free Fermanagh be mistaken for a warm or stable Ireland. Ice-sheet reconstruction is difficult because advancing ice erodes earlier deposits and because evidence from different districts has different precision. Recent syntheses indicate that ice-sheet growth was under way across the British–Irish region around 31,000 years ago, while the maximum Irish expansion occurred later, principally around 26,000–23,000 years ago. Around the date considered here, Ireland was therefore best understood as environmentally varied and vulnerable to rapid climatic shifts, not as uniformly engulfed by ice or uniformly open country.

The Castlepook Fauna

In north County Cork, Castlepook Cave near Doneraile—also known as Mammoth Cave—supplies the principal animal record for this broad pre-Last Glacial Maximum world. Antiquarian excavations recovered a remarkable but complicated collection of bones from cave sands, breccias and stalagmite-associated deposits. Later radiocarbon work demonstrated that some fauna belonged to MIS 3, though the old excavations and disturbed cave contexts mean that individual finds cannot automatically be treated as one simultaneous assemblage.

The securely significant picture is nevertheless striking. Castlepook yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared and Norwegian lemmings, and spotted hyena. The presence of hyena is especially consequential: it indicates a carnivore range now unimaginable in Ireland and suggests that caves could be used or entered by animals as dens, feeding places, traps or shelters. Mammoth and reindeer point to open, cold-country habitats, but their bones do not demonstrate that every species shared the same patch of ground at the same moment. Cave deposits accumulate over long periods, and scavenging, trampling and later disturbance complicate their history.

This fauna makes the island’s ecological isolation a question rather than a simple assumption. Large mammals had reached Ireland during portions of the Late Pleistocene, presumably through changing routes and seaways across the wider north-west European landscape. Yet precise connections between Ireland, Britain and the continent changed with sea level, ice margins and local geography. The evidence supports animal movement and ecological connectivity; it does not allow a confident reconstruction of a particular migration route at 31,247 BCE.

The Human Question

No hearth, stone-tool assemblage, built shelter, burial, human bone, repeatedly occupied floor or food-processing area has been securely dated in Ireland to this interval. Consequently, there is no basis for narrating a resident Irish population, named communities or a continuous Palaeolithic occupation in the 31,240s BCE. The much firmer evidence for people in Ireland belongs to the terminal Pleistocene, many millennia later, including cut-marked animal bone from Alice and Gwendoline Cave in County Clare.

Castlepook has, however, reopened the question. A reindeer femur from the cave has been reported as bearing a deep linear mark interpreted as damage made by a stone tool during fresh-bone butchery, and the bone has been publicised as approximately 33,000 years old. If that interpretation and chronology remain robust, it would be an important indication that people reached Ireland during MIS 3. It would still be only an indication of human handling of one carcass, not proof of permanent settlement, population size, ancestry, language, route of travel or social organisation.

The distinction matters because continental Upper Palaeolithic evidence is rich enough to tempt easy storytelling. Hunter-gatherers elsewhere in Europe made sophisticated tools, organised movement across large territories and maintained varied social and symbolic practices. None of those facts can be transferred wholesale to Ireland without Irish artefacts or occupation deposits. The most that can responsibly be said is conditional: if people visited the island in this period, they would have encountered a difficult northern environment and animal communities that offered both resources and danger. Their actual numbers, duration of stay and cultural affiliations remain unknown.

No Polities, No Chronicle

Political affairs, diplomacy and warfare leave no identifiable Irish evidence at this date. There were no demonstrable kingdoms, borders, monuments, farms, mines, markets or trading ports. Likewise, religion, art and learning cannot be recovered from the Derryvree wetland or the Castlepook bone collection. A cave used by hyenas is not a shrine; a reindeer bone is not proof of hunting ritual; and open tundra does not reveal human belief.

Economy and everyday life can therefore be discussed only through ecology. Plants fixed themselves in wet soils and pool margins; herbivores browsed, grazed or ranged through open country; predators and scavengers followed animal concentrations and carcasses. Seasonal productivity was probably crucial to every creature able to live there. For hypothetical human visitors, the possible economic opportunities were animal meat, hide, bone and antler, but these remain general inferences from the wider European Palaeolithic rather than documented Irish practices.

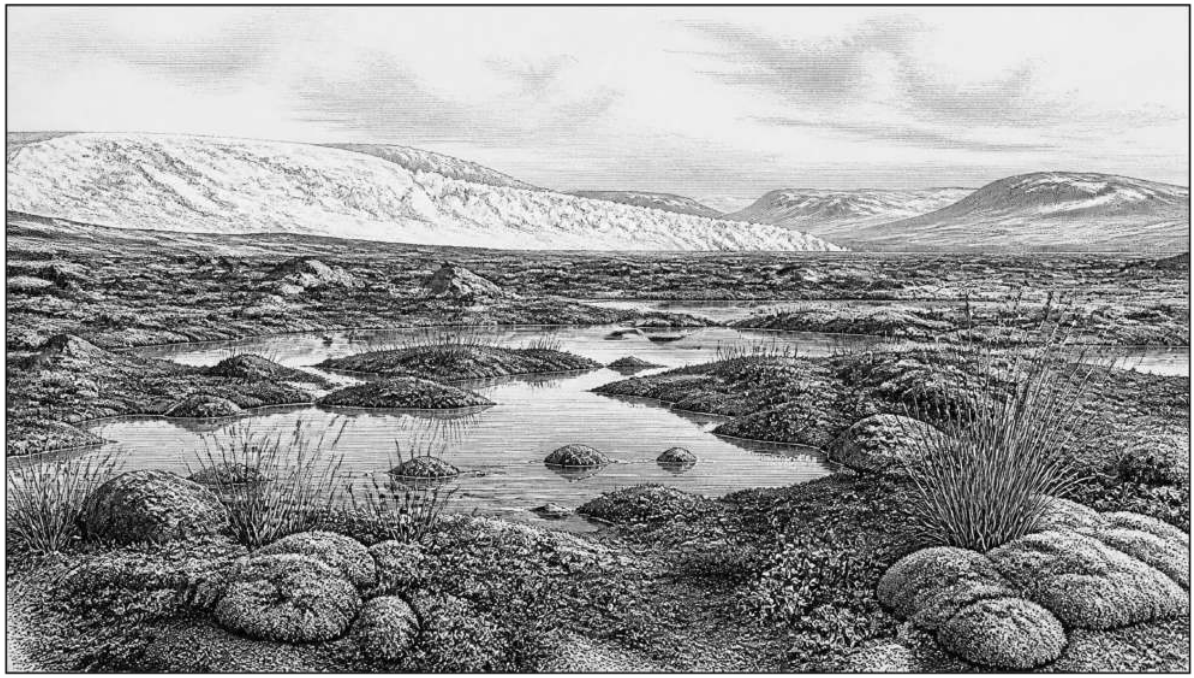
What the Evidence Can Say

Ireland around this point in deep time was a changing Late Pleistocene landscape, not an empty page but not yet a historical society. Derryvree preserves an ice-free, periglacial wetland interval with tundra vegetation and freshwater life; Castlepook preserves evidence of a distinctive cold-stage fauna in the south. Together they show that parts of the island supported complex ecosystems before the Last Glacial Maximum reshaped the land. They also show why restraint is necessary. The material record is fragmentary, dates are ranges, and the early human signal is not yet an excavated settlement. For 31,247 BCE, Ireland’s most defensible story is one of mossy pools, sedges, frost, shifting ice and the animals whose remains endured where almost all other traces were destroyed.

Chapter 055 of 100

31246 BCE

Derryvree’s Muskeg Horizon [55]



The label 31,246 BCE cannot denote a recoverable year in Irish history. No written record, annual chronology, named individual or securely dateable event exists for Ireland at this depth of time. In archaeological terms it corresponds only approximately to 33,200 years before AD 1950, during Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the Late Pleistocene. The relevant evidence is dated in calibrated ranges, often spanning centuries or millennia, and comes from sediments, pollen, plants, insects, animal bones, cave deposits and the landforms left by ice. It can illuminate an interval near this notional year; it cannot tell us what happened in one calendar year.

The best Irish evidence for the broader horizon is therefore environmental. It describes a changing island at the north-western edge of Europe, where cold conditions, shifting ice margins and open habitats governed which animals could live or move through the landscape. Whether people visited is an important but unresolved question. Ireland at this point was not a country with rulers, diplomacy, settlements or recorded conflicts. It was a physical landscape whose history must be assembled cautiously from fragmentary natural archives.

A Wetland Between Ice Sheets

One of Ireland’s most valuable archives lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed fine sands, silts and organic material enclosed between two thick tills: unsorted debris laid down by glacier ice. The discovery was exceptional. Later glaciation has removed or buried much older ground surface across Ireland, but at Derryvree a pocket of freshwater and wetland sediment survived beneath the reshaped drumlin.

The deposit produced radiocarbon determination BIRM-166, conventionally reported as 30,500 ± 1,100 radiocarbon years BP. Such a measurement is not equivalent to a modern calendar date; calibration against changing atmospheric radiocarbon levels produces a broader calendar-age range. Its uncertainty, and the fact that a sediment bed accumulated over time, rule out matching it to 31,246 BCE exactly. Nevertheless, Derryvree is generally assigned to a Middle Midlandian cold phase broadly close to the period under consideration, and it is direct evidence that at least part of Fermanagh was ice-free when the wetland formed.

Plants and small organisms recorded in the silts point to a treeless, cold wetland or muskeg rather than a forested Irish countryside. The landscape included shallow or slow-moving freshwater, sedges and moss-rich ground, with low vegetation able to exploit a short growing season. This does not prove that the same conditions extended across the whole island at once. It does show that Ireland was not simply an unchanging white expanse of ice. Local basins could sustain standing water and productive wet ground during intervals when ice had retreated, thinned or had not yet advanced over them.

That local qualification matters. Pollen and plant macrofossils tell archaeologists what entered a particular deposit; their abundance may be influenced by wind, water and preservation. The organic layer offers a carefully bounded environmental reconstruction, not a panoramic map. Yet its existence between tills establishes the larger sequence: a living wetland preceded a renewed glacial advance that sealed it. Ireland’s Late Pleistocene history was made through such alternations, not a single uninterrupted Ice Age.

Animals on the Atlantic Edge

Caves in the Blackwater catchment of north Cork provide a second, very different source of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile, yielded an extensive collection during antiquarian excavations in the early twentieth century. Its passages received evocative names including Elephant Hall, Wolf Hall and Hyaena Hall, reflecting the extraordinary fossils found there. Direct dating and re-dating have shown that some fauna belong to MIS 3, substantially earlier than older laboratory results had suggested.

The assemblage includes or has included reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These animals should not be imagined as one neatly simultaneous community occupying a single meadow. Cave deposits may combine remains accumulated over long periods. Carnivores can drag bones into dens; water can move sediment and bone; and the old excavations did not meet present-day standards of stratigraphic recording. Direct radiocarbon measurements date individual animals rather than an entire cave layer. Even so, the fauna demonstrates that large mammals and cold-adapted species reached Ireland during the wider pre-Last Glacial Maximum interval.

Reindeer are especially revealing. Their presence implies open country capable of supporting grazing or browsing herds, while mammoth and hyaena indicate that Ireland formed part of a wider north-west European faunal world rather than an isolated modern-style island. The exposed continental shelves and lower sea levels of the Pleistocene altered coastlines profoundly. But fossil animals alone do not reveal the exact route by which any population entered Ireland, or whether dry land, sea ice, short water crossings and temporary corridors mattered most at a particular time. The evidence supports connectivity in the broad ecological sense, not a mapped highway.

The cave record also gives no warrant for confident claims about hunting territories, clan boundaries or a hierarchy of predators and people. Mammals moved according to season, food, shelter and changing terrain. A hyaena den and a human campsite leave very different signatures, but both can result in bones

entering a cave. Distinguishing those processes is central to responsible interpretation.

The Reindeer Femur Question

A fragment of reindeer femur from Castlepook has made this interval unusually significant for Irish archaeology. County Cork heritage publications identify it as dating to about 31,000 BCE and record zooarchaeologist Ruth Carden’s interpretation of a deep incision as a mark made by a sharp stone implement during butchery. If that diagnosis is upheld, the bone may be evidence that Upper Palaeolithic people processed a reindeer in Ireland some 20,000 years before the long-established terminal-Pleistocene evidence for human presence.

It is a striking possibility, but its limits are as important as its promise. The femur comes from an old collection, rather than a modern excavation of an intact floor containing a hearth, tools, food waste and dating samples in secure association. A radiocarbon determination dates the animal’s death, not necessarily the cutting event, the place where the animal was killed, or the moment when the bone arrived in the cave. Identifying a surface scar as a stone-tool cut rather than carnivore damage, breakage, trampling or later disturbance is a separate taphonomic judgement.

Accordingly, the femur cannot demonstrate a permanent Irish population, a settlement at Castlepook, a language, ancestry, named archaeological culture or continuous occupation. Nor can it establish that people hunted the animal rather than encountered and processed a carcass. The most that can responsibly be inferred is modest: if the mark is human-made and contemporary with the bone, one or more people used a sharp cutting edge on reindeer in Ireland during this broad cold-stage interval. That would be a momentous extension of the human record, but not a complete social history.

Recent fieldwork has returned to Castlepook precisely because modern excavation, dating and sediment analysis may test old collections more effectively. A 2022 investigation involving researchers from Liverpool John Moores University, University College Dublin and other institutions sought new evidence at the cave. Its importance lies not in confirming a dramatic story in advance, but in improving the context in which the older finds can be assessed.

Ice in Motion

At roughly 33,200 years before present, the British–Irish Ice Sheet was entering a major phase of growth. The latest large-scale BRITICE-CHRONO reconstruction models steady build-up across Ireland and Britain from about 31,000 to 26,000 years ago, before maximum areal extent around 26,000 years ago and maximum volume somewhat later. This does not mean that every Irish district was simultaneously buried at the beginning of that process. Ice-sheet margins advanced unevenly, and local topography, marine basins and changing climate shaped contrasting regional conditions.

Derryvree’s intertill wetland and the Cork cave fauna belong to this larger story of transition. They preserve evidence from intervals before renewed ice cover eliminated many habitats and obscured much of the earlier archaeological landscape. By the Last Glacial Maximum, Ireland was probably almost wholly ice-covered, although the exact distribution of ice, cold-based cover and possible exposed high ground remains debated region by region. The distinction is important: a landscape that was habitable during one MIS 3 interval could become inaccessible or ecologically impoverished later.

The sea was also not a fixed boundary. Global sea level was lower than today because more water was locked in continental ice, but the local shape of coastlines was affected by ice loading and crustal movement as well as ocean level. It is therefore misleading to picture modern Ireland projected

unchanged into the Pleistocene. The shorelines, plains and marine passages through which animals—and perhaps people—could move were repeatedly altered.

What Cannot Be Claimed

Political history is absent. There is no evidence for kingdoms, leaders, alliances, warfare, diplomacy, laws or institutions in Ireland around this date. There is likewise no securely documented dwelling, burial, art site, ritual place, textile, boat, hearth or stone-tool assemblage that can be assigned to 31,246 BCE. Religion, language, learning and cultural identity cannot be reconstructed from Derryvree mud or a single modified bone.

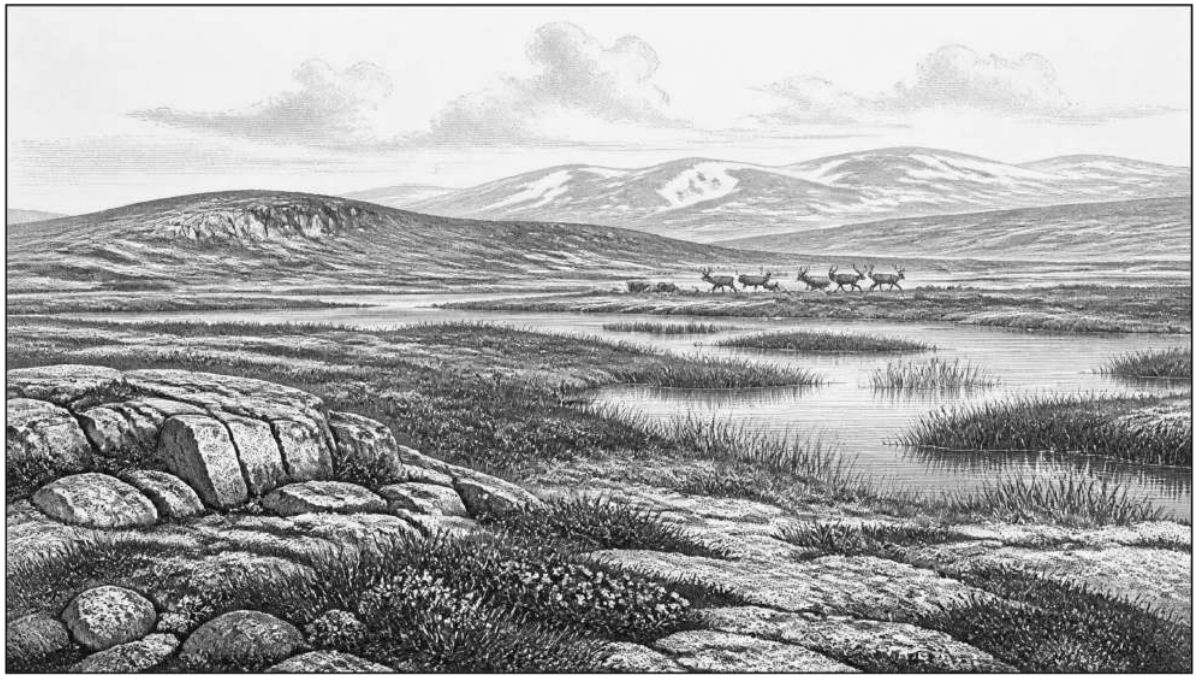
Economy and everyday life are similarly beyond direct recovery. If people briefly reached Ireland, they may have been mobile foragers familiar with stone technology and the resources of large mammals; that is an inference from the possible cut mark and wider Upper Palaeolithic comparisons, not an observed Irish settlement pattern. Reindeer could in principle yield meat, marrow, hide, sinew, antler and bone, but Castlepook's femur does not show which materials were taken or how they were shared. A cave may have been a carnivore den, a natural trap, a place where floodwater accumulated bones, or occasionally a shelter; it need not have been a human home.

The most secure history for this horizon is therefore environmental and evidential. Near the future ice-sheet maximum, Ireland contained changing cold-stage landscapes: freshwater wetlands in Fermanagh during an ice-free interval; open habitats capable of supporting reindeer and other large mammals; and caves in Cork that accumulated a complex record of animals, sediments and perhaps a fleeting human trace. The Derryvree muskeg and Castlepook femur do not give Ireland an annual chronicle. They give it something more scientifically valuable: a disciplined reminder that deep history is built from ranges, contexts and carefully limited conclusions.

Chapter 056 of 100

31245 BCE

The Castlepook Reindeer Fragment [56]



The label “31,245 BCE” offers a useful point on a modern timeline, but it cannot identify an event in Ireland in the way a medieval annal can. No writing, named communities, calendar systems or year-by-year archaeological sequence exists for the island at this depth of time. In radiocarbon terms, the date falls roughly 33,200 calendar years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the Last Glacial Period. The responsible history of Ireland at this point is therefore a history of deposits, bones, pollen, insects, landforms and dating ranges—not of a demonstrable occurrence on one particular day or in one particular year.

It was an Ireland unlike the familiar green island. Conditions varied sharply across centuries and millennia, and the pattern of advancing ice, open ground, water and frozen soils differed by region. At about 31,245 BCE, the Last Glacial Maximum lay in the future: the British–Irish Ice Sheet reached its greatest known extent much later, broadly after c. 26,000 years ago and before c. 20,000 years ago. Yet this was already an Ice Age world, and the evidence indicates that Irish landscapes and animal populations were repeatedly transformed as ice margins expanded or retreated.

A Date Measured in Ranges

Archaeologists and Quaternary scientists cannot presently assign a securely excavated Irish occupation surface to 31,245 BCE. Radiocarbon dating produces estimates with statistical uncertainty; calibration converts radiocarbon years into calendar ranges by comparison with independently dated records, rather than supplying a precise ancient calendar date. Old cave collections add a further difficulty. Many bones were recovered in nineteenth- and early twentieth-century excavations, when recording

standards differed profoundly from those used today. Cave sediment was often disturbed by animals, water, collapse and previous digging. A bone can be dated directly, but its find-place may not represent an intact living floor or a single episode.

This distinction matters especially at Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork. The limestone cave system has produced one of Ireland's richest assemblages of Pleistocene vertebrate remains. Its collections include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Those animals did not necessarily live together, and the deposits do not describe one stable ecosystem. Direct dates show that different specimens belong to widely separated phases of the late Pleistocene. Castlepook is a deep archive, not a frozen instant.

The Reindeer Bone and Its Limits

The closest evidence to this notional year is a reindeer femur fragment from Castlepook that has been reported as roughly 33,000 years old and bearing a linear modification interpreted as a stone-tool cut mark. If that interpretation withstands continuing taphonomic scrutiny, it would be evidence that people processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the formerly accepted terminal-Pleistocene evidence for human activity. It is potentially a major discovery.

Potential is not proof of a settlement. The dated object is an animal bone, not a house, hearth, stone-tool assemblage, burial or occupation layer. A cut mark may show butchery, but it cannot reveal how many people were present, whether they camped in the cave, how long they remained, or whether their visit was part of a recurring pattern. It also cannot establish uninterrupted population. The safest conclusion for around 31,245 BCE is that a human incursion into southern Ireland is possible, perhaps even likely if the mark is confirmed as anthropogenic; a permanent Irish population at this date is not demonstrated.

This caution is strengthened by the later history of the evidence. Ireland's first widely accepted direct indication of human activity comes from Alice and Gwendoline Cave, near Ennis in County Clare: a brown-bear patella bearing cut marks, dated by two laboratories to approximately 12,810–12,590 and 12,810–12,685 calibrated years before present. That terminal-Pleistocene find is much later than the Castlepook reindeer fragment, but it illustrates both the value and the rarity of securely dated traces. There is still no known Irish Upper Palaeolithic settlement comparable to the excavated camps, structured hearths and rich lithic scatters known in parts of Britain and continental Europe.

An Open, Severe Landscape

The animal record makes clear that Ireland could support substantial life in parts of MIS 3, even though its climates were severe by modern standards. Reindeer were adapted to treeless or sparsely wooded northern environments and could range across open country. Woolly mammoth, giant deer and horse-like steppe fauna elsewhere in north-west Europe depended on extensive vegetation; carnivores such as wolf and spotted hyaena followed opportunities created by prey, carrion and shelter. Their presence in Irish cave deposits shows that routes of colonisation existed at various times and that suitable habitats formed, but it does not permit a single, complete reconstruction for 31,245 BCE.

In northern Ireland, sites such as Derryvree near Maguiresbridge in County Fermanagh and Aghnadarragh near Lough Neagh preserve environmental evidence between layers of glacial till. Their sequences have been interpreted as recording intervals when ice had withdrawn or was absent locally, allowing ponds, marshes and open ground to develop before later ice overrode the landscape. Organic silts

at Derryvree yielded remains of mosses, sedges, bogbean, Arctic-alpine herbs and freshwater organisms, alongside insects. The assemblage has been read as a treeless muskeg or wet tundra mosaic: shallow pools and sedge-rich margins within a cold, exposed terrain.

These northern records should not be treated as a weather report for County Cork or for one calendar year. They are nonetheless vital because they show the kinds of environments available in Ireland during the broader Middle Midlandian phase. Vegetation was low, discontinuous and responsive to abrupt climate shifts. In sheltered places there may have been dwarf shrubs, herbs and wetland plants; on better-drained surfaces, wind, frost and seasonal thaw would have restricted soil development. Forest was not the dominant cover. The rich grasslands, enclosed fields, peat bogs and mature woodland of later Ireland belonged to a very different world.

Ice, Water and Changing Connections

Regional change was the dominant political fact of this era—although “political” must be used metaphorically. There were no states, chieftaincies, borders, diplomatic agreements or recorded wars to recover. Instead, shifting ice and sea determined access, safety and resources. Geological work suggests that much of north-central Ireland remained ice-free until at least about 34,000 years ago, before the major build-up of the last Irish ice sheet. Southern and western areas also preserve evidence of pre-Last Glacial Maximum fauna and landscapes. But the configuration of ice and water was not static, and reconstructions remain debated in detail.

Lower global sea level exposed land now drowned beneath surrounding seas, but low sea level did not automatically create a straightforward walk from Britain into Ireland. The Irish Sea basin had deep and complex topography, while crustal movement, glaciers, river systems and local water bodies altered possible routes. Research on later periods has challenged simple assumptions of a broad, enduring Irish land bridge. For 31,245 BCE, it is more accurate to say that animal and, conceivably, human movement required changing coastal and marine corridors whose precise form is not yet securely known.

Caves were important to this landscape not as proven homes, but as traps and repositories. Carnivores could drag in prey; animals could die in fissures; flowing water and sediment could rearrange bones. Castlepook’s spotted-hyaena remains are especially significant because hyaenas often accumulated bone assemblages in dens. A reindeer femur with a possible human modification must therefore be assessed against natural marks made by teeth, trampling, sediment movement and excavation damage. Modern re-examination, direct dating, microscopic analysis and carefully recorded new excavation are more informative than simply repeating old identifications.

Society Beyond the Evidence

If people did reach Ireland in this period, they were Upper Palaeolithic hunter-gatherers, not farmers. Their survival would have depended on close knowledge of animal movement, seasonality, stone, fuel, shelter and clothing. Reindeer carcasses could provide meat, fat, hide, sinew, bone and antler; a single butchery trace is therefore consistent with a highly mobile subsistence economy. Yet consistency is not evidence of the specific practices of an Irish group. No securely associated tools, hearths, dwellings, ornaments, art or graves permit a detailed account of language, kinship, ritual, learning or social hierarchy.

Nor can trade or diplomacy be reconstructed. A visitor may have crossed from Britain or from another part of north-west Europe, perhaps following game through a changing landscape, but no source identifies an exchange network or a route. The absence of evidence may partly reflect later glaciation, erosion,

rising seas and the difficulty of finding ephemeral camps. It must not, however, be converted into a confident story of a vanished Irish people. Archaeology can identify possibilities and probabilities; it cannot supply invented chiefs, migrations or ceremonies.

What This Year Can Mean

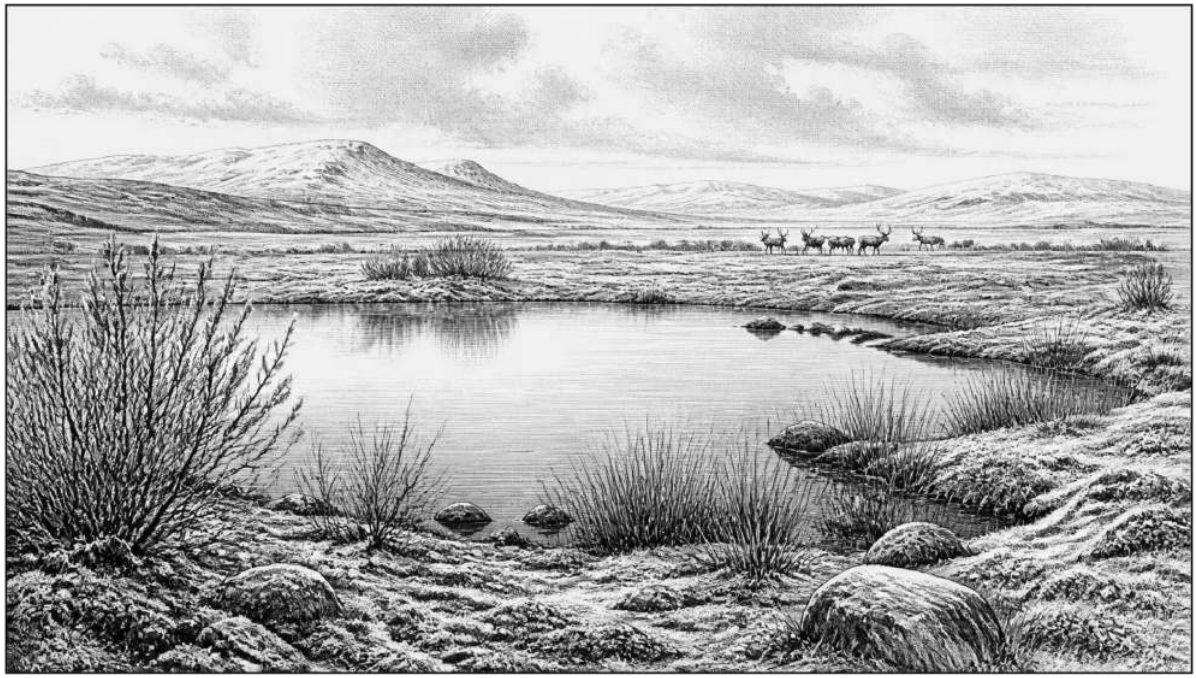
Around 31,245 BCE, Ireland stood within a fluctuating Ice Age frontier. The most important development was environmental rather than institutional: open and often cold landscapes supported a Pleistocene fauna while ice-sheet growth, sea-level change and climatic instability continually reshaped the island’s habitability. Castlepook Cave offers the most evocative clue, a reindeer fragment whose reported cut mark may eventually extend Ireland’s human story dramatically backwards. Derryvree and Aghnadarragh provide the wider environmental setting of wetlands, tundra vegetation, freshwater life and successive glacial advances.

For now, the year should be understood as a calibrated horizon rather than a dated chapter in human affairs. The evidence supports Ice Age animals in Ireland and supports the possibility of a very early human encounter with them. It does not support a named society, a permanent settlement, a political order or an exact event in 31,245 BCE. That restraint is not a weakness in Ireland’s earliest history. It is the essential discipline that allows a small bone, a buried seed and a layer of silt to remain meaningful evidence rather than become a prehistoric fiction.

Chapter 057 of 100

31244 BCE

Fermanagh’s Buried Pond [57]



31,244 BCE is a modern calendar label, not a date at which Ireland’s past can be observed year by year. No people on the island are known to have counted years in this way, and neither archaeology nor palaeoenvironmental science can isolate an event to a particular season, let alone a particular year, more than 33,000 years ago. Expressed in the convention used by Quaternary scientists, the notional date falls at roughly 33,200 calibrated years before present (cal BP, where “present” is 1950). It belongs to the later part of Marine Isotope Stage 3, or MIS 3: a long, climatically unstable interval of the last Ice Age.

The responsible subject for Ireland at this point is therefore not an annual chronicle of rulers, battles or settlements, but a landscape reconstructed from exceptional scraps of evidence. These include plant-rich sediments buried beneath later glacial deposits in County Fermanagh; cave minerals in County Kerry; animal bones from Irish caves; and the wider record of changing ice, sea and climate around north-west Europe. They reveal portions of an island that could, at different times, support tundra wetlands and large mammals. They do not establish a continuous human population, a named people, or a single island-wide environment.

A Date Within a Range

The closest important Irish environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. There, organic freshwater silts were found between two tills: unsorted sediments deposited by ice. The deposits contained plant remains, pollen and insects, providing a rare glimpse of conditions between phases of glaciation. A legacy radiocarbon determination from the sequence has been calibrated to a broad range of about 36,900–31,700 cal BP. The modern date of 31,244 BCE lies within that range,

but it must not be mistaken for a precisely dated layer of mud, plant, animal or human activity. The range shows that an ice-free freshwater environment existed in that part of north-central Ireland during later MIS 3; it cannot show that every part of Ireland was ice-free at once.

This distinction matters because the Irish record is fragmentary and regional. Ice sheets and glaciers later eroded, buried and rearranged older ground. The evidence surviving beneath a drumlin in Fermanagh is valuable precisely because it escaped complete destruction, not because it offers a representative cross-section of the whole island. Geologists can trace the effects of ice through landforms, tills and striations, while dated sediments provide particular chronological anchors. Yet the timing, thickness and extent of ice during the build-up to the Last Glacial Maximum remain subjects of reconstruction rather than a settled map for every millennium.

Cold Water and Open Ground

Derryvree's biological remains indicate a harsh but not lifeless setting. The freshwater deposits included mosses, sedges and aquatic or wet-ground plants, among them bogbean and water-milfoil, as well as arctic-alpine taxa such as mountain-avens. Insect evidence similarly points to cold, open conditions. The resulting picture is not of the forested Ireland familiar from later prehistory or the present day. It is a periglacial mosaic: shallow pools and wet hollows, mossy and sedgy margins, sparse herbaceous vegetation and expanses exposed to wind, frost and seasonal change. Dwarf willow or other low shrubs may have occurred in sheltered places, but there is no basis for imagining continuous woodland.

Such a landscape had practical consequences for every living creature. Plant growth would have been strongly seasonal. Wetlands offered water and vegetation in summer, while winter cold and frozen ground constrained movement and food supply. The sediment record cannot tell us the weather on a day in 31,244 BCE, but it does support the broader interpretation of an environment in which liquid water was available at least intermittently and biological communities endured severe cold. It also demonstrates why Ireland should not be reduced to a simple image of an island entirely sealed beneath ice throughout the whole Ice Age.

Crag Cave near Castleisland, County Kerry provides a different kind of evidence. Uranium-thorium dating of ancient speleothems there shows episodic calcite growth through much of the last glacial period, including later MIS 3. Stalagmite growth requires water to move through the limestone system and normally indicates conditions above the freezing point at least often enough for infiltration and deposition. This does not mean that south-west Ireland was warm, wooded or permanently ice-free. It does, however, independently reinforce the conclusion that climatic ameliorations punctuated the glacial regime, and that conditions varied sharply through time and between regions.

Mammals on a Changing Margin

Irish cave collections preserve another narrow but significant line of evidence. Reindeer, woolly mammoth, giant deer, horse, brown bear and spotted hyena are among the animals recorded from Late Pleistocene Irish contexts, especially caves in the south and south-east. Direct dating and reassessment of old collections have shown that some of this fauna belongs to MIS 3, before the fullest expansion of the last ice sheet. Caves are not straightforward snapshots of a living landscape: bones can be moved by water, carnivores, scavenging, excavation and later disturbance. Still, the dated fauna establishes that Ireland was accessible to changing populations of large mammals during parts of this period.

The precise combinations of animals need careful handling. A bone dated from a cave proves that the animal, or its remains, reached that location; it does not automatically prove a stable local herd, an unbroken food web or simultaneous coexistence with every species recovered from the same cave. Nevertheless, reindeer and other grazing or browsing animals fit the evidence for open, cold country. Predators and scavengers, including spotted hyena, point to a more complicated ecological world than an empty polar desert. Limestone caves could serve as shelters, dens or traps for accumulating bone, but the archaeological deposits known in Ireland have rarely survived in undisturbed form.

The Human Question

Human presence around this notional date remains possible but unproven as a matter of settlement history. A reindeer femur from Castlepook Cave near Doneraile, County Cork, has been publicised as bearing a deep mark interpreted as a stone-tool cut made during butchery; work on the associated fauna places the bone broadly around 33,000 years old. If that interpretation is correct, it would show that Upper Palaeolithic people handled a reindeer carcass in Ireland during MIS 3. It would be an important early trace of human activity on the island.

But the limits of that claim are as important as its promise. Castlepook has not yielded a securely excavated, stratified camp with hearths, stone-tool assemblages, repeated occupation surfaces or human remains of this age. One marked bone cannot identify who made the mark, whether they killed the animal or scavenged it, how long they stayed, or whether others accompanied them. Nor can it demonstrate a permanent population. The most responsible description is that a possible episode of human butchery has been proposed, requiring corroboration from better-contextualised finds.

Accordingly, political affairs, diplomacy and organised conflict cannot be recovered for Ireland in 31,244 BCE. There are no states, chiefs, boundaries, treaties or communities identifiable in the evidence. If people did visit, they were almost certainly highly mobile hunter-gatherers operating within wider north-west European networks, but that is an inference from Upper Palaeolithic lifeways elsewhere, not a demonstrated Irish social order. No Irish ritual site, art, burial, language, teaching tradition or formal exchange network can responsibly be assigned to this date. Portable tools, hides, wooden objects and camps would have had poor survival prospects even without the destructive force of later ice.

Ice, Sea and Access

Lower global sea level changed the outlines of the surrounding seas, exposing areas now submerged on the continental shelf. Yet low sea level does not licence the easy statement that Ireland was joined to Britain by a simple, reliable land bridge at this time. The geography of the Irish Sea basin, shifting coastlines, rivers, estuaries, ice margins and possible marine barriers was complex. Any human or animal movement towards Ireland may have involved routes that appeared and disappeared as climate and sea level changed. The fauna proves access on some occasions; it does not reveal the exact route.

During the following millennia, the British–Irish Ice Sheet expanded dramatically. Syntheses of dated evidence indicate growth from largely ice-free conditions in parts of Ireland at about 34,000 years ago towards much more extensive ice by the Last Glacial Maximum, conventionally centred around 26,000–20,000 years ago. The later ice sheet reshaped valleys and lowlands, deposited tills, formed drumlins and erased or concealed much of the evidence that might once have recorded earlier visits. The silence of the archaeological record is therefore not proof that nobody ever arrived, but neither is it evidence for an established Ice Age society.

A Landscape Before the Advance

Ireland around 31,244 BCE was thus a changing glacial frontier rather than the settled island of later history. The best evidence supports cold freshwater habitats in Fermanagh during a broad dated interval, episodic milder conditions capable of sustaining cave-water flow in Kerry, and the presence of large mammals in landscapes intermittently available to them. A possible cut-marked reindeer bone raises the prospect of a human encounter. Beyond that, certainty gives way to interpretation. The period’s real historical significance lies in this fragile archive: sediments, calcite and bone preserving evidence of life just before later ice transformed the ground on which that life unfolded.

Chapter 058 of 100

31243 BCE

Crag Cave’s Thawwater [58]



The label 31,243 BCE is a modern chronological convenience, not a year that can be recovered from Ireland’s archaeological record. No people in Ice-Age Ireland used a calendar of numbered years, and neither radiocarbon dating, cave deposits nor glacial sediments can identify an event within a single year so far back. In radiocarbon practice, “present” is conventionally AD 1950, but a numerical conversion is only a guide: radiocarbon ages must be calibrated, and their calendar ranges at this depth are broad. The responsible setting is therefore the later part of the Last Glacial Period, broadly Marine Isotope Stage 3 (MIS 3), rather than a supposed episode on one exact day or in one named season.

This was a time of severe climatic instability in north-west Europe. Cold stadials alternated with comparatively milder interstadials over centuries and millennia. Ireland’s evidence is unusually fragmentary because later glaciers eroded, buried and rearranged older landscapes. What survives is not a historical narrative of rulers, battles or settlements, but a small number of environmental archives, animal bones and cave deposits. Together they show that parts of the island could sustain cold-stage life during intervals before the Last Glacial Maximum, while also warning against turning scattered finds into an imagined Ice-Age society.

A Landscape Between Advances

Around this broad horizon, the British–Irish Ice Sheet was developing and changing, not simply sitting at a fixed edge. Modern reconstructions distinguish alternative minimum, optimum and maximum ice limits because the chronology and extent of early ice growth remain uncertain. The later Last Glacial Maximum, when ice covered all Ireland and extended across much of its continental shelf, belongs chiefly

to roughly 27,000–23,000 calibrated years before present. At the earlier point represented by 31,243 BCE, it is safer to speak of a dynamic glacial world in which ice, permafrost, sea level and habitable ground varied from region to region and through time.

That uncertainty matters. It would be wrong to picture the entire island as either a continuous white ice cap or a wholly open hunting ground. Some evidence indicates earlier growth and retreat–advance behaviour in the ice sheet during MIS 3; other evidence records local conditions incompatible with permanent frozen ground or ice cover. Later glaciation has removed much of the terrain that might have settled the question. The map of Ireland was also unlike the modern one. Globally lower sea levels exposed wider shelf landscapes, but local relative sea level was affected by the weight of ice depressing the land. A firm land bridge, crossing route or coastline cannot responsibly be drawn for this particular notional year.

Derryvree’s Buried Wetland

The strongest Irish environmental evidence close to this timespan comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed freshwater silts and fine sands sealed between two tills: glacial deposits left by separate ice advances. The intervening organic layer was radiocarbon dated to 30,500 ± 1,170/1,030 radiocarbon years BP. This is not a date for a single event, and calibration produces a wide calendar interval rather than a point on a timeline. Published discussions place the deposit broadly in the middle-to-later part of MIS 3, making it an important contextual archive, not proof that its contents belong specifically to 31,243 BCE.

Its fossils nevertheless offer a rare view of an Irish cold-stage landscape. Poorly preserved pollen, plant remains, mosses and insect evidence indicate open, treeless vegetation and a periglacial climate. The best interpretation is tundra or muskeg-like ground: wet, mossy and sedgy in sheltered places, with shallow pools, organic-rich margins and sparsely vegetated drier ground nearby. This was not the later familiar Ireland of oak woods, farms and enclosed fields. It was an austere but living environment, in which short growing seasons and frost shaped what could grow. Sparse tree pollen should not be mistaken for nearby forest; transported or reworked grains are possible, whereas the wider assemblage supports largely open country.

Derryvree also demonstrates the value and the limitation of palaeoecology. Sediments can preserve organisms too slight or too short-lived to appear in conventional archaeological sites. They record water, plants and insects, then were sealed beneath ice. Yet they cannot tell us the names, languages or movements of people. They show ecological opportunity and constraint rather than human occupation. In political terms, there is no evidence for polities, leaders, borders, diplomacy or organised warfare in Ireland at this date. In religious and cultural terms, there are no securely Irish burials, shrines, images, ornaments, musical instruments or writing from which beliefs or learning could be reconstructed.

Water Beneath Crag Cave

Crag Cave in County Kerry provides a second, very different archive. Uranium–thorium dating of calcite speleothems—stalagmites, stalactites and related cave deposits—shows episodic growth through much of the last glacial period. In a shallow cave system, calcite growth requires liquid water to travel through soil and rock, conditions that also imply the local absence of an ice sheet or continuous permafrost immediately above the cave. The Crag Cave sequence includes growth during late MIS 3 and into early MIS 2, with dated samples providing unusually precise evidence by Pleistocene standards.

The interpretation must still be careful. A growing speleothem does not mean warm, settled or pleasant conditions outdoors; it records a suitable hydrological and thermal threshold at one place. Nor does it establish that every part of south-west Ireland was ice-free at the same time. Its real importance is that it preserves evidence for repeated thaws or milder interstadial conditions in a country whose surface record was repeatedly damaged by ice. The cave’s calcite can therefore be set beside Derryvree’s freshwater deposits: both reveal that the Irish environment changed sharply, rather than remaining uniformly frozen throughout the long approach to glacial maximum.

Animals and the Human Question

Southern Irish caves, especially Castlepook Cave near Doneraile in County Cork, have yielded a notable Late Pleistocene fauna. Reassessment of old collections with improved collagen pretreatment and radiocarbon methods has shown that several earlier dates were too young. Mammoth, reindeer, giant deer and spotted hyaena belong to the wider story of cold-stage Ireland, but their remains do not form a single simultaneous herd. Cave deposits accumulated through natural deaths, carnivore activity, water movement, sediment disturbance and antiquarian excavation. Some species may have disappeared locally well before the Last Glacial Maximum. The evidence is powerful precisely because it is physical, but it requires each bone and layer to be considered in its own context.

A reindeer femur from Castlepook has been publicised as bearing a deep mark consistent with cutting or chopping by a stone tool, and the animal bone has been dated to about 33,000 years ago. If that mark is confirmed as human-made and contemporary with the fresh carcass, it would be a remarkable indication of a brief Upper Palaeolithic human incursion into Ireland. It would not, however, prove a permanent population, a camp, a named culture or a continuous occupation. There is no securely associated hearth, stone-tool assemblage, dwelling floor, burial, human bone or art of this age in Ireland. Carnivore damage, abrasion, breakage and excavation damage must always be excluded when interpreting a single modified bone.

The most defensible social picture is therefore one of absence of evidence rather than evidence of an organised Irish society. If people did reach the island during a favourable interval, they were likely highly mobile hunter-gatherers using portable equipment and exploiting animal resources, as contemporaneous groups elsewhere in north-west Europe did. That is an inference from regional comparison, not a fact demonstrated by an Irish settlement. There is no basis for identifying trade routes, regular exchange, ethnic identities, languages or inherited institutions. Nor should these possible visitors be called “Irish” in a national or cultural sense that belongs to far later history.

A Deep and Uneven Past

For Ireland around 31,243 BCE, environmental change deserves greater emphasis than politics or culture because it is what the evidence can actually illuminate. Freshwater silts at Derryvree record open, cold wetlands between phases of glaciation. Speleothems at Crag Cave record episodes when water could again percolate through south-western Irish ground. Cave faunas establish that large mammals reached the island during parts of the Pleistocene, although not necessarily together or continuously. Castlepook’s marked reindeer bone raises a major question about human presence, but does not yet answer it conclusively.

That restraint is not a failure of history; it is the proper result of deep-time research. Ireland’s archaeological record at this horizon has been filtered by ice, sea-level change, cave processes and the imperfect practices of early collecting. Future excavations, direct dating and microscopic study may strengthen, revise or overturn today’s interpretations. For now, 31,243 BCE should be understood not as a year with an Irish event attached to it, but as a point within a long, changing Ice-Age interval: a landscape of thawwater, tundra wetlands, roaming animals and possible human visits, known in fragments beneath the deposits of later worlds.

Chapter 059 of 100

31242 BCE

Hyenahall’s Open Range [59]



31,242 BCE is a modern filing date, not a year that anyone in prehistoric Ireland could have named, recorded or experienced as a fixed point in a calendar. No archaeological method can isolate events in Ireland to that single year. In conventional archaeological terms it falls roughly 33,200 calibrated years before present (cal BP, where “present” is 1950), within the Late Pleistocene, Marine Isotope Stage 3. The responsible subject is therefore not a supposed event of 31,242 BCE, but the evidence for an Irish Ice Age landscape in the surrounding millennia: a cold, changeable country, at times ice-free and capable of supporting an unexpectedly varied mammal fauna.

A Date Within a Long Climate Cycle

The broad interval around 33,000–32,000 cal BP was part of the last glacial cycle, long before the Last Glacial Maximum reached its greatest extent. Greenland ice-core chronologies describe rapid alternations between relatively milder interstadials and colder stadials across the North Atlantic world. On that framework, the notional date lies late in Greenland Stadial 5.2, but this should not be mistaken for a weather report from Ireland: a Greenland climatic division cannot simply be transferred, year for year, to a particular Irish valley. Its value is to show that this was an age of abrupt environmental instability rather than one unchanging “Ice Age”.

Ireland was not yet the familiar Atlantic island of modern maps. Much water was locked in global ice sheets, lowering sea level and exposing extensive shelves around Britain and Ireland. Yet lower sea level does not automatically prove a continuous, easily passable land route into Ireland. Local sea depth, changing coastlines, glacial loading of the land and the shifting behaviour of the British–Irish Ice Sheet all

affected possible passages. The evidence allows the conclusion that animal movement into Ireland was possible during suitable intervals; it does not identify a specific route, crossing or coastline for 31,242 BCE.

Derryvree's Tundra Wetland

The most informative Irish environmental sequence close to this deep timescale lies at Derryvree, near Maguiresbridge in County Fermanagh. A road cutting exposed organic silts and fine sands trapped between two thick tills in a drumlin. The deposit produced the radiocarbon determination Birm-166, 30,500 radiocarbon years BP, with a substantial uncertainty. When calibrated using modern curves, this broadens to approximately 36,900–31,700 cal BP. It cannot date one year, but it overlaps the chronological horizon of this article and demonstrates an ice-free interval between glacial advances.

Plant macrofossils, pollen and fossil insects from Derryvree indicate open tundra vegetation and a periglacial regime. The site was not simply a dry, featureless plain: its sediments describe a wetland or muskeg with open pools, abundant plant material and mossy margins. Cold-adapted plants and insects point to severe winters and short growing seasons, while freshwater conditions show that liquid water and productive local habitats persisted in sheltered places. Derryvree is evidence from one locality, not a complete map of Ireland; nevertheless, it decisively complicates any picture of the island as either wholly ice-covered or wholly lifeless throughout the period.

Its position between tills is equally important. The lower till records an earlier episode of glaciation; the organic bed records an interval in which vegetation, insects and freshwater sediments accumulated; the upper till records later ice advance. Thus the Irish landscape around this wider period was subject to regional change on a formidable scale. Wet ground that supported pond life and tundra vegetation could eventually be overridden, buried and preserved beneath ice-laid sediment. Much evidence for open-air activity, if it ever existed, was likely eroded, reworked or concealed by those subsequent glacial processes.

The Castlepook Faunal Archive

For animal life, Castlepook Cave near Doneraile in north County Cork is the key Irish site. Also known as Mammoth Cave, it is a limestone maze whose passages acquired names such as Hyenahall and Elephant Hall during early exploration. Excavations between 1904 and 1918 recovered more than 2,000 bones. Geological Survey Ireland describes it as Ireland's richest vertebrate-fauna site for the period leading towards the Last Glacial Maximum. Its reported fauna includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena.

This assemblage establishes an important environmental fact: at various points in the middle and later Ice Age, parts of Ireland were within the range of a far richer cold-stage mammal community than the later island fauna might suggest. Large grazing animals imply open country with enough vegetation to support them; predators such as wolf and spotted hyaena imply wider food webs, not isolated specimens in a vacuum. Reindeer, lemmings and Arctic fox are especially consistent with cold, open conditions. Mammoth and giant deer reveal the capacity of some Irish landscapes to sustain, or at least receive, large herbivores during favourable phases.

But Castlepook is an archive, not a single scene. Its bone-bearing deposits accumulated across many thousands of years. Carnivores could drag carcass parts into caves; animals could die there; water could move sediment and bone; and early excavators worked before modern standards of fine-grained stratigraphic recording. Later re-dating has also shown that some older radiocarbon determinations from

southern Irish caves were too young because earlier bone-treatment methods were less reliable. A list of species from Castlepook must therefore never be recast as a claim that mammoths, hyaenas, reindeer and people all stood together in the Awbeg valley in 31,242 BCE.

The Reindeer Femur Question

One Castlepook object makes the human question unusually significant. A fragment of reindeer femur from the old collection has been presented in County Cork heritage material as roughly 33,000 years old and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage made with a sharp stone tool during carcass processing. If that interpretation is sustained, it would indicate that one or more Upper Palaeolithic people handled a reindeer in Ireland during this broad interval: a potentially remarkable extension of the island's human story.

The qualifications are essential. The dated bone came from an old, disturbed cave assemblage, not from a modern excavation of an intact campsite. Radiocarbon dates the death of the animal, rather than independently dating the incision or revealing where the carcass was processed. Identifying a surface modification as a stone-tool cut is a separate taphonomic judgement, requiring distinction from carnivore damage, breakage, trampling, weathering and excavation marks. No securely associated lithic assemblage, hearth, dwelling floor, burial, art object or concentration of butchered bones has been published from Castlepook for this period. The 2022 excavation located surviving sediments but recovered no cultural artefacts.

Accordingly, the femur can support a deliberately narrow conclusion: it is possible evidence for a brief human episode of reindeer processing in Palaeolithic Ireland. It cannot prove a permanent population, a village, a named people or an uninterrupted ancestry leading to later Irish communities. If people were present, they may have been a small and highly mobile party. Hunting is plausible, but scavenging or processing an animal killed elsewhere cannot be excluded. Meat, hide, sinew, fat, bone and antler would all have been useful resources, yet the single femur does not demonstrate precisely which were taken or how.

No Polities, No Proven Institutions

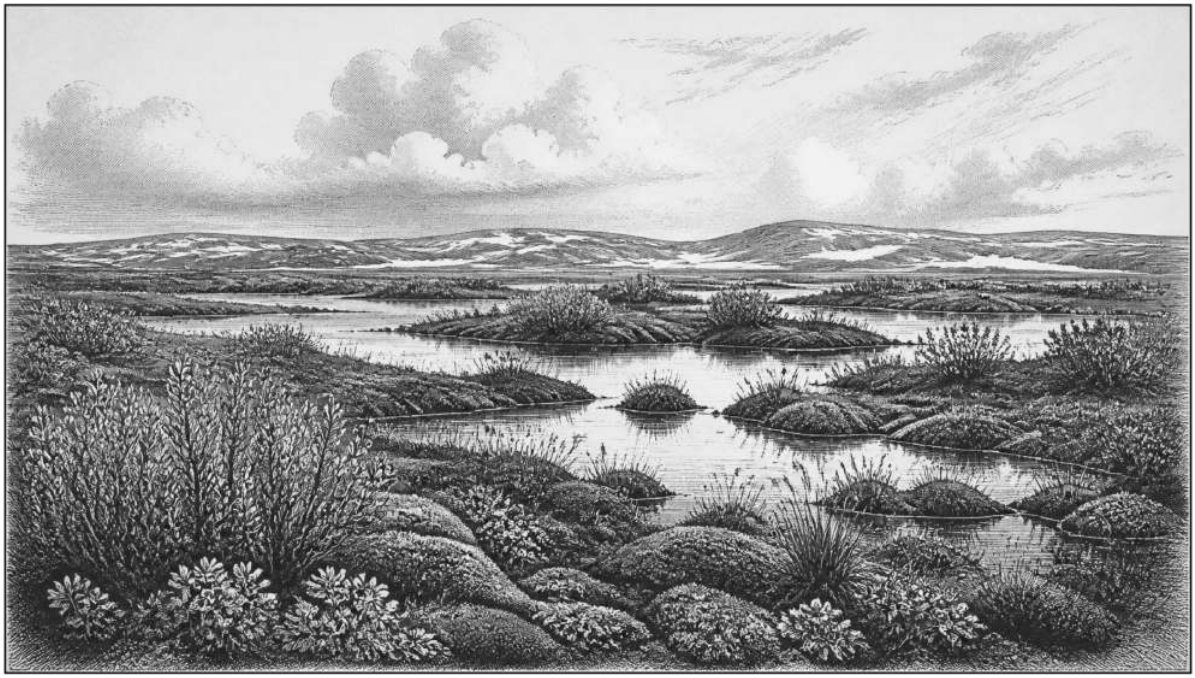
There is no basis for describing political affairs, diplomacy, territorial lordship, organised warfare, trade networks, formal religion or learning in Ireland at this date. Nor is there evidence for agriculture, domesticated herds, pottery, metalworking, fields or permanent settlements. Those absences are not merely gaps in a written record; they reflect the absence so far of securely dated archaeological features that could demonstrate such activities. Comparisons with Upper Palaeolithic societies elsewhere in Europe can show what human groups were capable of—fire use, sophisticated stone technologies, tailored clothing, symbolic expression and long-distance social ties—but none of these should be imported into Ireland without Irish evidence.

The central development around this chronological horizon was environmental opportunity constrained by volatility. In Fermanagh, freshwater tundra wetlands briefly accumulated organic evidence between ice advances. In north Cork, cave deposits preserve traces of an animal world that linked Ireland to wider north-west European ecosystems. The possible marked reindeer femur raises the prospect that people, too, reached this western edge of Europe. It remains a prospect, not a settled narrative. For 31,242 BCE, Ireland's history is best told through sediments, bones, insects, plants and the disciplined limits of what they can say.

Chapter 060 of 100

31241 BCE

Derryvree’s Water-Milfoil Basin [60]



The label 31,241 BCE offers a useful point of orientation, but it cannot describe a particular Irish year in the ordinary historical sense. It is a modern backward count, roughly 33,190 years before AD 1950, placed within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). Ireland had no writing, named peoples, political institutions or securely dated settlements that can be tied to this nominal year. Even radiocarbon determinations at this depth of time have broad uncertainties and must be calibrated into ranges rather than converted into an exact anniversary. The responsible history of Ireland at this point is therefore one reconstructed from sediments, fossil plants, insects, animal bones and the changing traces of ice.

A Date Within a Range

The most illuminating Irish evidence near this horizon comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a remarkable sequence: freshwater silts and fine sands containing organic remains lay between two thick sheets of till, the unsorted sediment left by glacier ice. The central deposit was assigned the laboratory number BIRM-166 and produced a conventional radiocarbon age of 30,500 years before present, with an uncertainty of roughly a millennium either side. Published calibrated treatments place the episode broadly within about 36,900–31,700 calendar years before present.

That range overlaps the broad timescale represented by 31,241 BCE, but it does not identify a single year, season or generation. Nor does it mean that every part of Ireland looked like Derryvree at the same time. A buried wetland in south Fermanagh is a highly local archive. Its importance lies in showing that,

during a cold interval between glacial advances, freshwater and plant life existed there, and that the island’s glacial history was more complicated than a simple story of continuous ice cover followed by a final thaw.

Freshwater Between Ice Sheets

At Derryvree, the order of deposits supplies the central fact. Ice had laid down a lower till; then a body of freshwater sediment accumulated in an ice-free or ice-distal local setting; later ice deposited the upper till that sealed it. The organic bed therefore preserves a landscape that existed between episodes of glaciation. It was not a benign interglacial landscape. The plant and animal remains point instead to open tundra and periglacial conditions: ground exposed to intense seasonal freezing, short summers and a climate too severe for closed woodland.

The landscape can be envisaged as a wet, largely treeless mosaic rather than as an uninterrupted white desert. Shallow pools and slow-moving or standing water occupied hollows. Mosses, sedges and hardy herbs grew where moisture and summer warmth permitted. Fossils include aquatic and wetland plants such as water-milfoil and bogbean, alongside mountain avens, dwarf willow, juniper and lesser clubmoss. These are not a list from a single meadow; they are remains gathered through the life of a changing depositional environment. Together, however, they indicate open ground, persistent wetness and vegetation adapted to cold exposure.

Insect evidence strengthens this interpretation. Beetles associated with damp moss, sedge-rich ground, pools and decaying plant matter were preserved alongside the botanical remains. Such small fossils matter because insects often respond closely to local habitats. They suggest a tundra wetland with open water and vegetated margins, sometimes compared with muskeg: waterlogged, organic-rich ground broken by pools. Frost action would have shaped the soil, while snowmelt and summer rainfall fed the basin. In a country now strongly associated with green pasture and Atlantic woodland, Derryvree records an older ecological world.

Ice, Sea and an Uneven Island

The wider Irish setting was unstable. The Late Pleistocene climate was marked by abrupt shifts, and ice sheets expanded and reorganised around Ireland, Britain and the continental shelf. Evidence from Ireland’s western coast shows substantial glacial loading during the long interval before the Last Glacial Maximum, while later geomorphological reconstructions demonstrate the large scale and changing flow of the Irish Ice Sheet. Yet these records also warn against mapping one simple ice margin onto every locality or every century. Ice could advance across one sector while other places retained exposed ground, freshwater basins or ice-free margins.

By this period, global sea level was far lower than today because enormous volumes of water were stored in continental ice. The outlines of Ireland and its surrounding shelves therefore differed greatly from the modern coastline. This does not, by itself, prove an easy land route for people or animals at any particular moment. Sea level, local ice margins, rivers, lakes and terrain all changed; the Irish Sea basin was not a permanently open highway, nor can a land bridge simply be assumed. Movement across the wider north-west European region must remain a question of shifting opportunities rather than a fixed map.

For people living much later, the action of this ice would become part of the physical inheritance of Ireland. Drumlins, streamlined hills of till, are among the most conspicuous results. Derryvree's wetland survived precisely because later glacial sediment enclosed it within a drumlin. The preservation is paradoxical: the same processes that repeatedly disrupted the landscape also buried a small record of the life that had existed between advances.

Animals at the Edge of Evidence

Irish cave deposits and older museum collections indicate that a more diverse cold-stage fauna reached Ireland during parts of the Late Pleistocene. Reindeer, giant deer, horse, brown bear, Arctic fox, hare, lemmings, wolf, spotted hyaena and mammoth are among species reported from the pre-Last Glacial Maximum record. Castlepook Cave, near Doneraile in north Cork, is especially important because antiquarian excavations recovered remains attributed to several of these animals. Direct dates on some Castlepook bones fall in the wider pre-maximum period, around the mid-30,000s radiocarbon years before present.

These remains establish that suitable habitats and animal movements existed in Ireland at various times, but they do not supply a census for 31,241 BCE. Cave assemblages can be time-averaged: bones may have been accumulated over long spans, moved by carnivores or water, disturbed by excavation, and recovered without modern stratigraphic controls. A mammoth or hyaena bone from a cave cannot demonstrate that such an animal stood in Fermanagh—or even Cork—during this particular nominal year. The sound conclusion is narrower and more valuable: Irish environments before the Last Glacial Maximum could support, or at least receive, elements of a northern European cold-stage fauna.

Reindeer are particularly evocative because they fit the image of open, cold country, but their presence should not automatically produce a scene of human hunters. One reindeer femur from Castlepook has been dated to about 33,000 years ago and bears a possible cut-like modification. That observation has prompted serious discussion of early human activity in Ireland. It remains contested as evidence for human butchery because no securely associated stone tools, hearth, dwelling, human remains or undisturbed processing area of comparable age has yet been demonstrated. The bone is an important research problem, not a licence to proclaim a settled Palaeolithic population.

No Polities, No Proven Settlement

There is no evidence from Ireland around this date for political affairs, warfare, diplomacy, chiefs, tribes, ethnic names or territorial boundaries. These concepts depend on traces that have not survived or have not been found: settlements, burials, tools in secure context, repeated occupation surfaces or symbolic objects. Equally, there is no responsible basis for describing houses, clothing, family structure, language, religious practice, art, formal learning, exchange networks or trade on the island at this time. The absence of evidence does not prove that no person ever arrived; it means that the available evidence cannot support a historical narrative of society.

Across parts of continental Europe and Britain, Upper Palaeolithic communities were making sophisticated stone and bone tools, exploiting changing animal resources and producing forms of visual culture. That broader context makes occasional movement towards Ireland conceivable. But possibility is not proof. Ireland's own record at this horizon remains environmental and faunal rather than securely

archaeological. If humans did visit, their numbers, duration of stay, route, technology and relationship with the landscape are all unknown. They may have left no surviving trace, or apparent traces may yet be reinterpreted.

The Meaning of the Silence

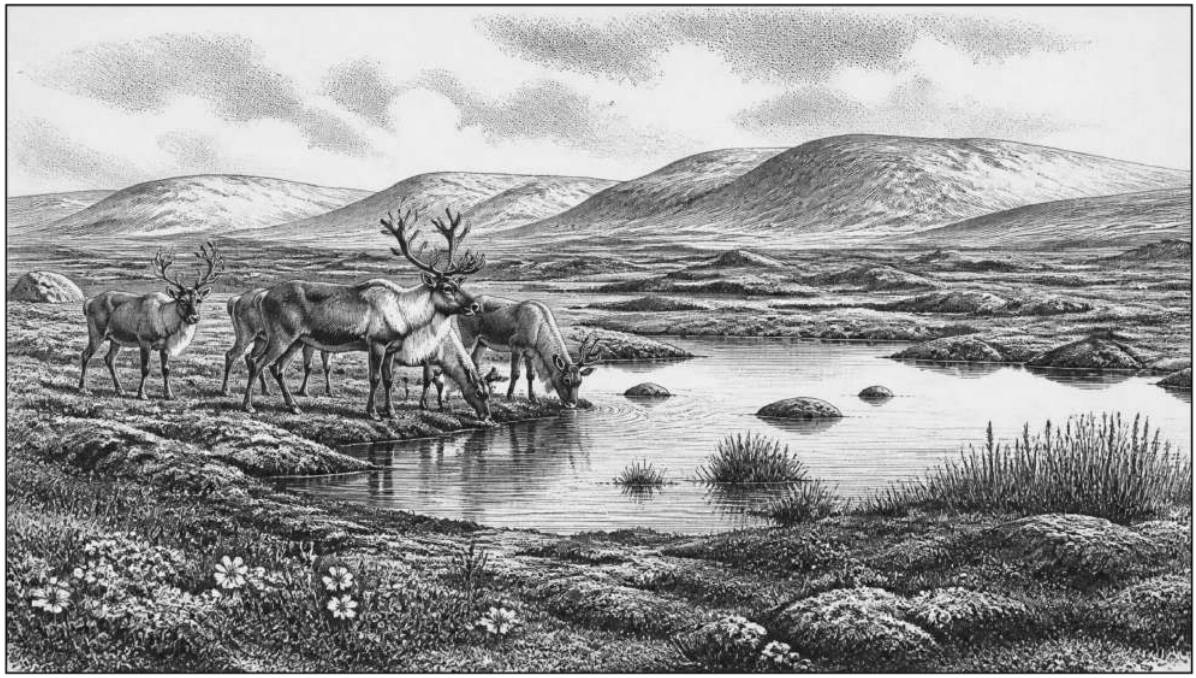
For Ireland in 31,241 BCE, the decisive development was environmental rather than political: a cold, fluctuating world in which ice, frost, freshwater and sparse vegetation continually reshaped the conditions for life. Derryvree provides the clearest local testimony. Its waterlogged silts preserve a tundra wetland of pools, mosses, sedges, herbs and insects during an interval bracketed by glaciation. Castlepook and other cave collections show that Ice Age mammals formed part of the island’s wider story, while also demonstrating the limits imposed by old excavations and incomplete dating.

This is not an empty prelude to later Irish history. The sediments record real ecological communities and real environmental change, even if they cannot name a single inhabitant or event. They show an Ireland whose familiar coastlines, woods and farms did not yet exist: a cold, exposed, regionally varied land facing further ice-sheet growth. The proper historical task is not to fill that silence with invented hunters, kingdoms or rituals, but to read the surviving evidence closely—and to recognise how much of deep Ireland remains beneath the till.

Chapter 061 of 100

31240 BCE

Maguirebridge’s Tundra Waters [61]



31,240 BCE is a modern calendar label, not a recoverable year in Ireland’s archaeological record. It falls roughly 33,200 years before the conventional radiocarbon reference year of AD 1950, in the Late Pleistocene and within Marine Isotope Stage 3. Neither written testimony, dated settlement layers nor annual natural archives permit history at calendar-year resolution here. The responsible approach is therefore to examine evidence whose calibrated ranges overlap this point: buried freshwater sediments at Derryvree near Maguiresbridge in County Fermanagh, cave faunas in County Cork, and the wider reconstruction of growing ice across Ireland and Britain.

What emerges is not a tale of Irish kingdoms, named peoples or a fixed population. It is a portrait of a cold and unstable landscape, locally capable of sustaining plants and animals, while increasingly vulnerable to renewed glaciation. Whether people briefly entered that landscape remains an important but unresolved question. The evidence is unusually evocative precisely because it is so sparse.

Dating a Cold Interval

The label 31,240 BCE should not be confused with a precise environmental moment. Radiocarbon years, calendar years and geological phases are different measures. A radiocarbon determination from the key Derryvree deposit, BIRM-166, was published as 30,500 years BP, with an uncertainty of approximately a thousand years. Subsequent discussions have placed its calibrated span broadly around 36,900–31,700 calendar years BP. That wide interval overlaps the date considered here, but it does not prove that every plant, insect or sediment in the deposit belongs to 31,240 BCE itself.

Such qualifications matter. Ice-age climates changed abruptly on scales of centuries and millennia; deposits may accumulate over long periods; and later ice, floodwater and frost can disturb older materials. Ireland’s Late Pleistocene chronology has also been revised repeatedly as radiocarbon techniques,

calibration curves, ice-sheet modelling and re-examination of museum collections have improved. A year-by-year article at this depth must therefore describe a dated window rather than claim an event.

A Freshwater Bed Beneath the Drumlin

Derryvree is the strongest environmental witness close to this date. In 1969, road works cut through a drumlin two kilometres north-east of Maguiresbridge. Between two substantial sheets of glacial till lay silts and fine sands formed in freshwater conditions. The organic layers preserved pollen, plant macrofossils, mosses and invertebrate remains. Because later glacier ice deposited till both below and above the freshwater series, the exposure records an interval when this part of Fermanagh was not buried beneath ice.

The assemblage indicated treeless, open tundra and a periglacial regime: a severe climate in which freezing and thawing shaped ground and shallow waters. Mosses, sedges and small herbaceous plants could colonise saturated hollows and exposed mineral soils. Fossils associated with cold, wet ground and freshwater settings—including bogbean and water-milfoil—show that this was not a uniform desert of snow and stones. Pools, sedge margins, mossy ground and sparsely vegetated drier patches formed a shifting mosaic.

There is an important distinction between evidence and reconstruction. The fossils directly demonstrate that particular plants and small animals lived or were deposited in and near freshwater at Derryvree. Calling the wider setting a tundra wetland is an interpretation, albeit a well-supported one, drawn from their ecological requirements and from the sediments enclosing them. It does not entitle us to picture every valley in Ireland in the same way. Local relief, drainage, proximity to ice and season all mattered.

Ice, Water and a Changing Coastline

At this time the British–Irish Ice Sheet was building towards its later maximum, rather than sitting in a single unchanging configuration. Major syntheses place the principal build-up after roughly 35,000–32,000 years ago, with extensive maximum ice much later, approximately 27,000–21,000 years ago. More recent reconstructions emphasise that expansion was asynchronous: separate sectors advanced, retreated and reorganised at different times. The Derryvree sequence is especially valuable because it provides terrestrial evidence for a local ice-free interval amid that complicated history.

For people living in the modern island, it is tempting to ask whether Ireland was then joined to Britain or mainland Europe. Lower global sea levels exposed more continental shelf than today, but the changing Irish Sea basin cannot responsibly be reduced to a simple, proven land bridge. Animal colonisation demonstrates connectivity of some sort over long periods, not the exact route taken in any particular generation. Ice margins, sea crossings, exposed coastal plains and possible short-lived corridors remain matters for scientific reconstruction, not settled facts.

Nor did “Ireland” have its modern shorelines. The Atlantic shelf, river mouths and lowlands were differently arranged as sea level fell, land rose or sank under ice loading, and glaciers altered drainage. The familiar counties and towns are used only to locate evidence. Derryvree and Castlepook were not places in a political landscape; they were portions of a wider north-west European ecological frontier.

Animals at Castlepook

The most striking Irish animal evidence comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north Cork. Excavations from the early twentieth century recovered a large and now incomplete collection of bones from cave sands and chambers. The surviving fauna includes reindeer, woolly mammoth, brown bear, giant deer, wolf, Arctic fox, lemmings and spotted hyaena. These finds demonstrate that, during parts of the Middle and Late Midlandian cold stage, Ireland supported or received a fauna very different from that of the present day.

Yet Castlepook must not be treated as a snapshot. Bones span a long period, later water movement disturbed deposits, and many early excavations did not meet modern standards of stratigraphic recording. Individual radiocarbon dates establish the ages of individual specimens, not an instant when all listed species shared one valley. Reassessment of radiocarbon samples has moreover suggested that some apparently younger dates were affected by contamination and that giant deer and spotted hyaena may have disappeared locally well before the Last Glacial Maximum. A hyaena was therefore not necessarily roaming Cork at the precise date represented by 31,240 BCE.

The cave nonetheless conveys the character of the available habitats. Reindeer and mammoth are consistent with open, productive cold-country landscapes; brown bear, wolf and hyaena point to a food web able to sustain large carnivores and scavengers. Carnivores themselves helped create the archive, carrying prey remains into sheltered spaces. Castlepook was probably less a settlement site than a repeatedly used natural repository, perhaps including a den in some phases. Its evidence tells us more securely about animal presence and cave processes than about a single coherent community.

The Uncertain Human Trace

A reindeer femur from Castlepook has attracted exceptional attention because it has been reported as roughly 33,000 years old and as bearing a deep mark interpreted as stone-tool damage made during butchery. If that interpretation survives full specialist scrutiny, it would represent Ireland’s earliest known indication of human activity by a very large margin. It would suggest that Upper Palaeolithic hunter-gatherers reached, or at least briefly visited, the western edge of the European landmass during an ice-age interval.

It cannot, however, establish a resident population, a camp, an ancestry or an Irish “first people”. There are no securely associated stone tools, hearths, dwellings, burials or repeatedly occupied surfaces of this age in Ireland. Bone-surface marks require taphonomic assessment because trampling, breakage, carnivore activity and sediment abrasion can sometimes resemble human modification. The 2022 investigation at Castlepook located surviving deposits and recovered fauna, but found no cultural artefacts. The right conclusion is neither dismissal nor certainty: the bone is a serious and potentially transformative claim, but still a solitary one.

Life Without Institutions

No political affairs, diplomacy, leadership structures or organised warfare can be identified for Ireland around this date. There are no names, monuments, boundaries, settlements or artefact assemblages from which to infer them. If people did enter the island, comparison with Upper Palaeolithic societies elsewhere suggests small mobile groups dependent on knowledge of terrain, weather, animal behaviour and seasonal resources. That comparison may help frame possibilities; it is not direct Irish evidence.

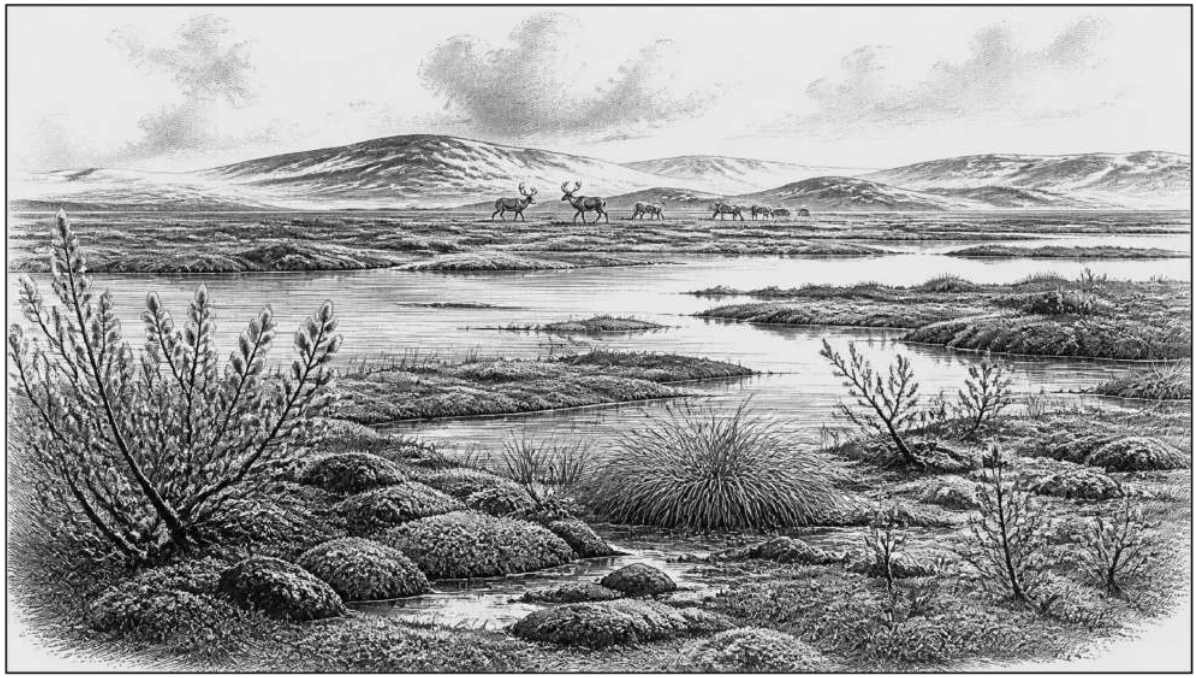
The same restraint applies to economy, trade, learning and religion. Reindeer carcasses could have supplied meat, hide, sinew, bone and fat, but no Irish assemblage demonstrates how such materials were processed, shared or exchanged at this time. No ritual place, image, grave or symbolic object can be assigned to 31,240 BCE in Ireland. The most defensible cultural history is one of practical environmental knowledge potentially carried by mobile visitors, not of institutions that can be named or mapped.

The major development was environmental rather than political: an Ireland of cold freshwater hollows and open ground was entering a phase in which advancing ice would become increasingly decisive. Derryvree preserves a moment when life persisted between glacial advances. Castlepook preserves animals whose remains survived chance deposition, excavation and later scientific reassessment. Together they show that Ireland was neither an empty abstraction nor a knowable human society. It was a changing Ice Age landscape, rich in ecological possibility but poor in the durable evidence from which conventional history is made.

Chapter 062 of 100

31239 BCE

Fermanagh–Cork Window [62]



The label 31,239 BCE is a modern chronological convenience, not a year for which Ireland possesses an event, ruler, settlement or dated human life. In conventional archaeological arithmetic it falls about 33,188 years before AD 1950, but such a conversion must not be mistaken for calendar-year precision. Radiocarbon measurements have uncertainties; their calibration produces ranges rather than single dates; and deposits accumulated over periods that may have lasted generations or millennia. The responsible setting is therefore later Marine Isotope Stage 3 (MIS 3), a fluctuating part of the Late Pleistocene, well before the fullest expansion of the last British–Irish Ice Sheet.

What can be said concerns environments, animal life and a very small, contested body of evidence for people. Ireland was not a historical country in any political sense. There were no states, chiefs known by name, diplomatic relations, written beliefs or recoverable traditions. Nor is there evidence for a permanent population. Yet the island was not simply an unchanging blank beneath ice. Sediments in County Fermanagh and cave faunas in County Cork preserve glimpses of cold, open landscapes that supported plants and animals during intervals before the later glacial maximum.

A Date Outside Annual History

The numbered year lies broadly within the time-span illuminated by the Derryvree organic deposits at Maguiresbridge, County Fermanagh. There, freshwater organic silts occur between two layers of glacial till. This sequence establishes a relative history: glacier ice had deposited the lower till; an ice-free interval then allowed wetland sediment, plant remains and small animal evidence to accumulate; later ice advanced over the locality and laid down the upper till. It is strong evidence for local environmental change, not a weather report for every part of Ireland.

An older radiocarbon measurement from Derryvree was 30,500 ± 1,200 radiocarbon years BP. Scholarship has expressed its calibrated implications broadly, including a range of roughly 36,900–31,700 calibrated years BP. The modern label 31,239 BCE happens to fall within that broad chronological neighbourhood, but no scientifically defensible method can attach the deposit to that exact year, season or generation. The traditional name “Derryvree Cold Phase” is useful shorthand, though it should not imply a single uniform climate or an island-wide event.

Wetland in a Treeless Land

Derryvree’s fossils make the landscape more tangible. The organic silts have yielded evidence for a treeless, cold wetland or muskeg, with sedges, mosses and plants suited to open ground and shallow freshwater. Bogbean (*Menyanthes trifoliata*), dwarf willow, mountain-avens and other cold-tolerant taxa have been used to reconstruct a damp tundra-like mosaic rather than a forested Ireland. Pools, marshy ground, stream margins and patches of herb-rich vegetation could coexist with drier, frost-affected surfaces.

This was a severe setting, but not necessarily a featureless snowfield. Seasonal thaw, standing water and short growing seasons offered ecological niches. Inferences about exact temperatures, annual snowfall or the extent of permafrost must remain cautious because the evidence comes from one preserved basin and because Ireland’s ice margins were mobile. Still, the biological assemblage decisively demonstrates that this Fermanagh locality was capable of sustaining freshwater life between glacial episodes. The future drumlin landscape was not yet a finished landscape; it was part of a terrain repeatedly remodelled by ice, meltwater, frost and sediment.

Castlepook’s Animal Archive

Nearly 300 kilometres to the south-west, Castlepook Cave near Doneraile in north County Cork preserves a different kind of archive. Its passages and chambers, formed in limestone, produced a remarkable collection during excavations conducted between 1904 and 1913. Among the recorded remains are reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These species do not prove that every animal lived together at one moment. Cave deposits accumulated over long intervals, and bones were moved by carnivores, water, sediment disturbance and, in places, earlier excavation.

That warning is fundamental. Castlepook is not a neatly sealed camp or a snapshot of one hunting expedition. The Irish Quaternary Fauna Project found that its bones represented widely differing ages and that some deposits had been heavily re-sorted. More recent redating using improved bone pretreatment has shown that several older determinations underestimated the age of Castlepook specimens by thousands of radiocarbon years. The cave nevertheless establishes that southern Ireland was reached by a distinctive cold-stage fauna during MIS 3. The combination of grazing animals, carnivores and small Arctic-adapted mammals is consistent with extensive open country, though it cannot furnish an exact map of vegetation or animal abundance in 31,239 BCE.

For everyday animal life, the cave also supplies a corrective to romantic images of a peaceful “mammoth-steppe”. Reindeer and giant deer were potential prey, but a landscape containing hyaenas, wolves and bears was dangerous. Hyaenas may have used caves as dens or scavenging places; bears also

used sheltered cavities. Some bones may represent animals that fell into fissures or died naturally, rather than kills made by people. The evidence reveals an ecosystem and its hazards, not a settled human food economy.

The Human Question

Castlepook matters especially because a reindeer bone from the older collection has been reported as bearing a deep modification interpreted as a cut or chopping mark made on fresh bone with a sharp stone implement. Public discussion has associated this find with an age of about 33,000 years ago. If the mark was made by a person at or soon after the animal’s death, it would be evidence for a human incursion into Ireland in the Middle Upper Palaeolithic, far earlier than the substantial Mesolithic record.

But this is a conclusion to weigh, not a foundation upon which to invent a community. The bone derives from an old collection rather than a modern excavation of an intact activity floor. No securely associated stone-tool assemblage, hearth, shelter, human burial, art, repeatedly occupied surface or manufacturing debris of comparable age has yet been recovered at Castlepook. The 2022 investigation located surviving deposits and recovered animal remains, but reported no cultural artefacts; some charcoal and hazelnut material proved modern when dated. The appropriate interpretation is therefore possible brief human activity, perhaps carcass processing by a small travelling party, rather than proof of permanent settlement or continuous occupation.

This distinction also protects the significance of the find. A single modified bone may be slight evidence, but in an island whose later glaciation destroyed, buried or reworked many potential sites, it is worth serious attention. Caves and museum collections can preserve evidence that open-air sites have lost. Yet the absence of excavated habitation evidence means that it cannot answer such questions as where these people slept, how many travelled together, which language they spoke, or whether they returned.

No Politics, No Proven Trade

There is no basis for describing political affairs, warfare, diplomacy, institutions or territorial boundaries in Ireland at this horizon. Nor can trade be demonstrated. An Upper Palaeolithic group capable of reaching Ireland, if one did, would have possessed social knowledge, practical skill and access to stone tools; but no Irish assemblage of this date identifies the raw materials, transport routes or exchange relationships involved. Lower sea levels changed the outline of the continental shelf, but changing sea level, ice cover and the geography of crossings make any particular route into Ireland uncertain. It is safer to say only that movement into or across the region was environmentally possible at some times and difficult at others.

Religion, formal learning and visual culture are likewise beyond recovery. No shrine, grave, ornament, image, musical object or intentional ritual deposit can be securely assigned to Ireland around this date. The people potentially represented by the Castlepook bone may have had complex beliefs and skills comparable to other Upper Palaeolithic populations in Europe, but that is a general comparison, not Irish evidence. Responsible history must preserve the difference.

The Approaching Ice Age Peak

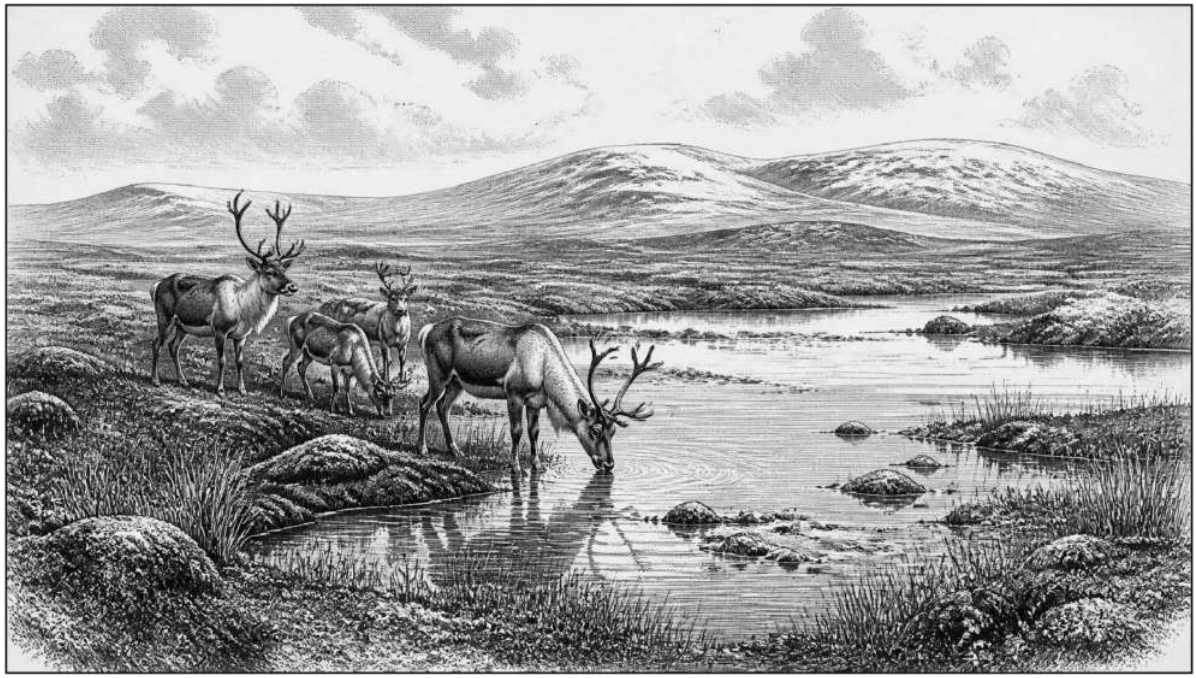
The long-term importance of this period lies in its position before a dramatic environmental contraction. Research on the British–Irish Ice Sheet indicates that the later Last Glacial Maximum covered all or almost all Irish low ground, with major expansion towards the Atlantic shelf edge after about 24,720 calibrated BP. At 31,239 BCE, that maximum lay ahead. Ireland's ice history was not a simple on–off sequence: local glaciers, ice sheets, open lowlands and periglacial environments could vary between regions and through time. But later ice advance would scour landscapes, redistribute sediment and make the survival of early archaeological traces exceptionally unlikely.

Thus the best picture for this date is deliberately modest but not empty. In Fermanagh, a cold freshwater wetland lay between episodes of glaciation. In southern Ireland, cave deposits record large herbivores and predators adapted to open Ice Age terrain. A marked reindeer bone raises the possibility that people briefly entered this world, but does not document a settlement. Ireland around 31,239 BCE was neither a kingdom nor an unpeopled abstraction: it was a changing northern landscape whose sparse archives preserve ecology more clearly than human story.

Chapter 063 of 100

31238 BCE

BIRM-166’s Long Interval [63]



The label 31,238 BCE is a modern chronological convenience, not a year that can be recovered from Irish evidence. It equates roughly to 33,200 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a highly unstable phase of the last Ice Age. No calendar, writing, named community, ruler, political boundary or historical event can be assigned to this particular twelve-month span. The responsible subject is therefore Ireland *around* this point in deep time: a changing glacial landscape known from sediment layers, fossil animals, cave deposits and scientific dating rather than from annals or monuments.

A Date Inside a Wide Range

The nearest especially informative Irish record lies at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed a drumlin cut by an extraordinary sequence of deposits. A lower till—stony, unsorted material laid down by glacier ice—was overlain by freshwater silts, fine sands and organic matter; a second till later sealed these sediments. The order is more secure than a precise date: ice had covered the locality, an interval followed in which standing or slow-moving freshwater and plant material accumulated, and ice returned afterwards. Derryvree is thus evidence for a locally ice-free episode between glacial advances, not a snapshot of all Ireland.

The organic deposit produced the conventional radiocarbon determination BIRM-166, approximately 30,500 ± 1,100 radiocarbon years before present. Radiocarbon years are not equivalent to calendar years. Because atmospheric carbon-14 has varied over time, results must be calibrated against independently dated records; at this antiquity, a single measurement translates into a broad probability range rather than a

historical timestamp. Published discussion places the Derryvree deposit broadly at about 36,900–31,700 calibrated years before present. The modern label 31,238 BCE falls within that interval, but cannot be attached to one sediment layer, season, animal or human action.

That limitation is central rather than inconvenient. Sediment can accumulate across many years, centuries or longer; an organic sample dates the carbon within it, not the precise duration of the landscape it represents. Moreover, later ice sheets eroded, reworked and buried much earlier ground surface. Ireland’s record for this period is therefore sparse and geographically uneven. Derryvree offers powerful local testimony, but it cannot supply a weather report for Cork, a map of every ice margin, or proof that people occupied the island at the exact point denoted by this article.

Wetland in a Periglacial Land

What Derryvree does show is a cold, open, periglacial environment. The freshwater deposits contained plant and insect evidence consistent with tundra or muskeg: a waterlogged mosaic of open pools, mossy ground and plant-rich margins rather than closed woodland. The evidence points to severe winters, a short growing season and treeless vegetation, although summer conditions could still support active freshwater habitats and abundant invertebrate life. This was not an unchanging white wilderness. It was a seasonal landscape in which thaw, standing water, frost and vegetation all mattered.

Such an environment belongs to the wider climatic volatility of Marine Isotope Stage 3. Across the North Atlantic region, comparatively milder interstadials alternated abruptly with colder stadials. Irish cave calcite records and the Derryvree sequence indicate that these wider shifts affected conditions on the island, but local responses depended on altitude, drainage, proximity to ice and the changing configuration of glaciers. It is safest to say that parts of north-central Ireland were ice-free during the broader Derryvree interval, not that the whole island was uniformly open or free of ice in 31,238 BCE.

The physical geography was also unlike that of modern Ireland. Sea level was lower during the glacial world, exposing areas now beneath the surrounding seas, while the extent of land, ice and water altered through time. Reconstructions demonstrate that connections between Ireland and Britain were possible during parts of the last glacial cycle, but their exact form, timing and usability varied with sea level, ice cover and terrain. A geographical opportunity for movement is not evidence that people, herds or particular species used it at a given moment.

Castlepook’s Animal Record

County Cork provides a different kind of evidence. Castlepook Cave, near Doneraile, is Ireland’s richest known repository of vertebrate remains from the period leading towards the Last Glacial Maximum. Its long, narrow limestone passages yielded more than 2,000 bones in early excavations, representing a fauna that includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with Arctic fox, wolf and lemmings also represented in later Ice Age material. These animals demonstrate that Ireland was part of a wider north-west European ecological world, capable at intervals of supporting large herbivores, predators and scavengers.

The cave collection must not be mistaken for one harmonious herd grazing outside a cave on a single day. Castlepook accumulated remains over a long period. Carnivores could carry bones into their den; water movement and later disturbance could shift them; and much excavation occurred before modern stratigraphic recording methods. Recent reassessment has shown that older radiocarbon results from Irish

caves may require revision because improved sample preparation can produce substantially different ages. Castlepook is consequently invaluable, but it demands careful separation of securely observed bone, inferred animal behaviour and wider environmental reconstruction.

For everyday animal life, the most defensible picture is ecological rather than narrative. Reindeer were adapted to open cold-country grazing; mammoths and giant deer were major herbivores; hyaenas, wolves and bears occupied differing carnivorous or scavenging roles. Their presence indicates routes of colonisation and habitats sufficient to sustain them, but not stable populations in every district or simultaneous occurrence of every species. The Ireland of this period was a shifting edge of ranges, not a settled pastoral landscape. There was no farming, no domesticated livestock, no field system, pottery, metalworking or market economy evidenced for this date.

The Reindeer Femur Question

One Castlepook object brings the human question unusually close to this article’s approximate date. A reindeer femur from the old collection bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during the processing of fresh tissue. County Cork heritage material presents the bone as dating broadly to about 31,000 BCE. If that interpretation is sustained, it is evidence that one or more people handled a reindeer in Ireland during the Upper Palaeolithic, far earlier than the better-established terminal-Pleistocene evidence from County Clare.

Its importance should be matched by restraint. The femur is not a house floor, camp, hearth, burial, toolkit or settlement. No stone implement is securely associated with the mark, and the bone was recovered from a cave sequence complicated by carnivore activity, water movement and antiquarian excavation. A radiocarbon determination dates the animal’s death within a range; it does not independently establish the exact moment at which an incision was made. The mark itself is an expert taphonomic interpretation, to be distinguished from damage caused by teeth, sediment, weathering or handling. Further work in undisturbed deposits is needed.

If people did reach Ireland during this broader interval, comparison with Upper Palaeolithic communities elsewhere in north-west Europe suggests highly mobile hunter-gatherers, equipped with stone-edged tools and knowledgeable about animal bodies, routes and seasonal resources. That is an interpretation based on wider archaeological comparison, not a demonstrated Irish social order. The evidence cannot reveal their language, identities, kin groups, beliefs, number, place of origin or whether they returned. Nor can it prove that they hunted the particular reindeer rather than scavenged a carcass or processed it elsewhere before carnivores brought remains into the cave.

No Politics, But Movement and Risk

There were no political affairs, diplomacy or warfare in the historical sense that can be recovered for Ireland at this time. There is no evidence for chiefs, territories, alliances, formal exchange networks or organised conflict. Equally, silence is not proof of social simplicity: any small human group would have depended on cooperation, shared practical knowledge and decisions about movement, food and danger. Yet those are reasonable human possibilities, not identifiable institutions. It would be anachronistic to call these people Irish, Gaelic or Celtic, or to project later national, linguistic or religious identities into a world more than thirty-three millennia distant.

Religion, learning and culture are similarly beyond direct recovery in Ireland around this date. No cave art, personal ornament, ritual deposit, burial or dwelling of this age has been securely identified on the island. Knowledge nevertheless existed wherever people existed: the knowledge required to travel through cold terrain, make and maintain cutting edges, recognise animal behaviour, prepare food and survive rapid environmental change. Archaeology can infer such practical capacities only if the Castlepook interpretation proves sound; it cannot reconstruct stories, ceremonies or systems of belief.

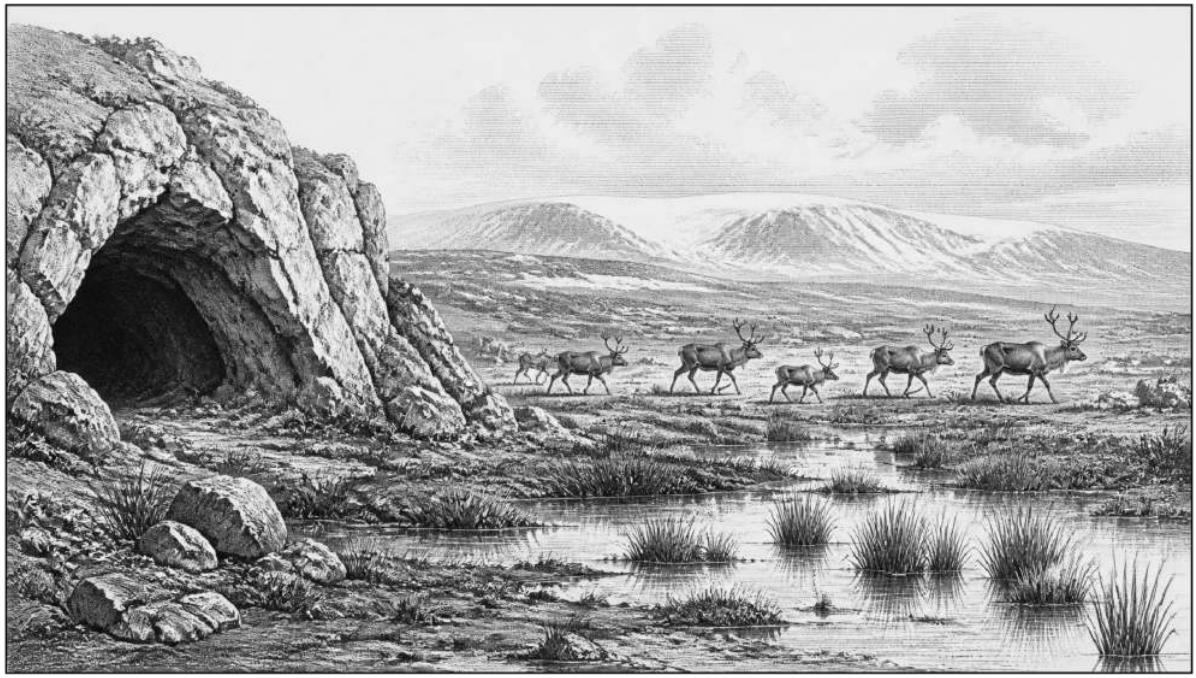
The great development appropriate to this point in Irish history is therefore environmental opportunity under severe constraint. Around the broad horizon represented by 31,238 BCE, an ice-free wetland at Derryvree could sustain tundra plants and insects, while the Castlepook record preserves an impressive cold-stage fauna in the south. Yet advancing ice was part of the longer story. The later British–Irish Ice Sheet expanded across much of Ireland and its continental shelf, remodelling landforms and helping to erase or conceal the fragile traces of earlier animals and any human visitors.

What survives is slender but significant: freshwater silt trapped between tills, fossil bones gathered in a cave, a reindeer femur with a contested but consequential incision, and scientific methods capable of placing them within wide chronological ranges. This is not a year of kings, battles or monuments. It is a long interval in which Ireland was intermittently habitable for cold-adapted life and perhaps briefly visited by people. The evidence does not permit a fuller annual chronicle; it does permit an unusually vivid glimpse of Ireland before the greatest expansion of the last ice sheet.

Chapter 064 of 100

31237 BCE

Mammoth Cave’s Uncertain Passage [64]



The label 31,237 BCE is a modern chronological convenience, not a recoverable Irish year. No calendar, written record, named community or dated event survives from Ireland at this depth of time. In archaeological terms it falls roughly 33.2 thousand calendar years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), long before the Last Glacial Maximum. Evidence must therefore be read in broad calibrated ranges, not converted into an imagined annual chronicle.

A Date Beyond Annals

Radiocarbon ages are not calendar dates by themselves. They measure the remaining carbon-14 in once-living material and must be calibrated against records of past atmospheric change. At more than 30,000 years ago, calibrated results commonly span centuries or longer. Even a securely dated bone tells us when an animal died within a probability range; it does not date every later movement, scratch or break affecting that bone. The numbered year is consequently best treated as a point within a much wider environmental interval.

Ireland was not yet the familiar Atlantic island of wooded lowlands, fields and settled coasts. Sea level was substantially lower than today because much water was locked in northern ice sheets, and the outlines of the Irish Sea basin, coastal plains and possible routes towards Britain differed greatly. Yet lower sea level alone does not prove a dry, easy land route into Ireland at any particular moment. Ice, water, estuaries, changing shorelines and harsh terrain all mattered. The evidence supports a changing north-west European landscape, not a mapped road followed by known travellers.

Cold Ground, Not One Climate

MIS 3 was climatically unstable. Greenland ice-core records show repeated abrupt shifts between relatively milder interstadials and colder stadials across the North Atlantic region. Those records provide an essential regional framework, but they cannot be turned into a precise weather report for Ireland in 31,237 BCE. Local conditions depended on altitude, exposure, distance from the sea, snow cover and the position of ice margins. One valley could contain waterlogged ground and sheltered vegetation while exposed uplands remained windswept, frozen and sparsely vegetated.

The Irish regional term Midlandian is used for the last glacial cycle. Its deposits show that ice advanced and retreated in complex episodes rather than covering every part of Ireland in one simple, uninterrupted sweep. Around the broad period in question, the island lay on the cold north-western edge of Europe. The later Last Glacial Maximum, conventionally placed at about 28,200–20,400 calibrated years BP, would bring far more extensive ice cover and profound erosion. That later glaciation is one reason why evidence for earlier landscapes and people is so scarce: ice removed, reworked or buried many shallow deposits that might once have preserved campsites.

Wetlands Beneath Fermanagh Drumlins

One of the most informative Irish environmental records for the wider timescale comes from Derryvree near Maguiresbridge in County Fermanagh. There, organic sediments were found between two tills: compact deposits left by separate movements of glacier ice. The order of layers is crucial. It demonstrates that, between ice-forming episodes, this northern interior contained exposed ground capable of supporting freshwater and wetland deposits.

The Derryvree material was assigned the radiocarbon determination BIRM-166, 30,500 ± 1,100 radiocarbon years BP. Correlating such an old, isolated deposit with an exact climate event is difficult, and its age should not be treated as a precise date for a single short-lived pond. Nevertheless, the site preserves botanical and insect evidence compatible with a cold, largely treeless environment: sedges, mosses, dwarf-shrub and tundra-associated plants, alongside freshwater habitats. It is firm evidence for a local wetland landscape during a cold interval; it is not proof that every part of Ireland looked identical.

This distinction is especially important for settlement history. Derryvree supplies no houses, hearths, tools, graves or human remains. It illuminates the ecological setting in which animals—and conceivably mobile people—could have moved through parts of Ireland. Its value lies in correcting the misleading picture of an island that was either wholly ice-covered or wholly welcoming. The evidence instead suggests a patchwork of opportunities and constraints: pools, marshes, open ground, seasonal watercourses, frost-shattered surfaces and nearby ice.

Castlepook’s Animal Archive

The most important animal archive relevant to this date lies much farther south, at Castlepook Cave near Doneraile in north County Cork, also known as Mammoth Cave. Excavations undertaken principally between 1904 and 1913 recovered a remarkable assemblage of Ice Age bones. Later study and redating have shown that at least some material belongs to MIS 3, well before the Last Glacial Maximum. Mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena occur in the wider Castlepook record.

These animals must not be imagined as one permanent, perfectly contemporaneous community. Cave assemblages accumulate over long periods. Predators may drag prey inside; animals may fall in or die nearby; water can carry bones through passages; frost, collapse and later excavation can mix deposits. The Irish Quaternary Fauna Project found that Castlepook's remains had been substantially resorted, probably in part by water action. Modern redating has also shown that some older radiocarbon determinations required revision after improvements in bone pretreatment. Castlepook is therefore a powerful archive, but not a sealed snapshot of a single hunting episode.

Even so, the fauna establishes a historically important point. Large mammals and cold-adapted species reached southern Ireland during this broad part of the last glacial cycle. Reindeer indicate open habitats with accessible forage; lemmings and Arctic fox point towards cold conditions; mammoth and giant deer evoke extensive, productive grass-herb landscapes rather than dense forest. Spotted hyaena is particularly significant. Its presence indicates a predator and scavenger able to exploit large carcasses, while caves could serve as dens or traps within a wider animal landscape.

The Reindeer Femur Question

A reindeer femur from Castlepook has made this period central to debate about the earliest possible human activity in Ireland. Public heritage accounts report that the specimen, dated broadly to about 33,000 years ago, bears a deep mark interpreted by zooarchaeologist Ruth Carden as damage made with a stone cutting tool while the bone was fresh. If that interpretation is confirmed, it would show that people handled a reindeer carcass in Ireland during the Upper Palaeolithic, many millennia before the better-established terminal-Pleistocene evidence from County Clare.

The claim deserves attention precisely because it is potentially transformative, but its limits must be stated plainly. The femur is evidence for an animal and a possible act of carcass processing, not for a village, a permanent population, a named culture or a continuous settlement. No securely associated stone tool, hearth, dwelling surface, human burial or stratified butchery floor has yet been published from the same context. The old excavations predated modern recording standards, and the cave deposits are complicated. A date on the reindeer establishes the animal's age, not automatically the moment when the incision was made.

Recent fieldwork at Castlepook has sought surviving Pleistocene sediments and clearer associations between bones, deposits and possible human traces. That work is valuable because the strongest test of the femur interpretation would be corroboration: further modified bone in undisturbed layers, lithic artefacts, securely dated charcoal or a coherent occupation deposit. Until then, the responsible conclusion is neither dismissal nor certainty. Castlepook offers Ireland's most intriguing possible pre-Last Glacial Maximum human signal, but not a demonstrated population history.

Life, Power and Belief Beyond Recovery

Nothing in the surviving evidence allows political affairs, diplomacy, warfare, law, language, kinship systems or religious beliefs to be described for Ireland in this period. There are no identifiable Irish communities to whom power or territory can be assigned. Likewise, there is no evidence for agriculture, livestock keeping, pottery, monuments, trade routes or formal learning. To fill these silences with generic 'Ice Age tribes' would replace history with fiction.

If people did reach Ireland, the most restrained inference is that they were few, mobile and equipped to survive in a demanding Upper Palaeolithic world already known elsewhere in Europe. A possible cut-marked reindeer bone might imply use of a sharp stone edge to take meat, hide, sinew or marrow; it cannot reveal whether the animal was hunted, scavenged, killed elsewhere or encountered by a short visiting party. Any such visitors would have depended upon detailed practical knowledge of weather, animal movement, shelter and raw materials. Those are reasonable inferences from survival in cold landscapes, not directly documented facts about a particular Irish group.

An Interrupted Human Prospect

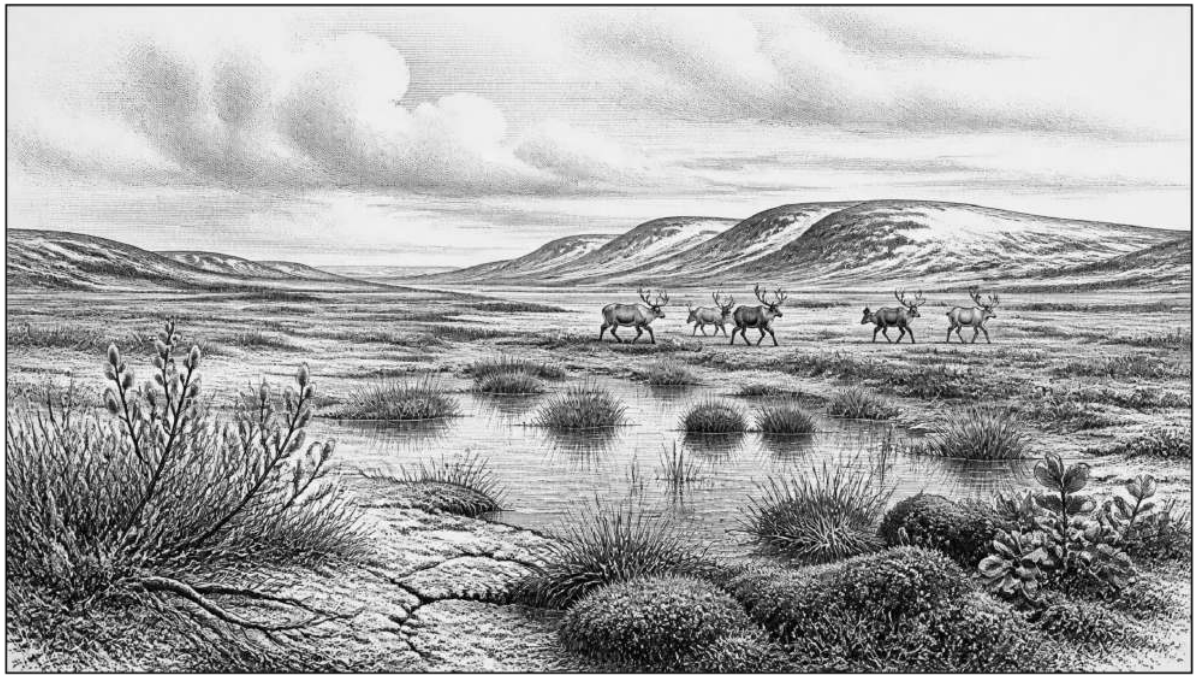
The principal development around 31,237 BCE was environmental, not political: Ireland formed part of a volatile Ice Age world where open habitats and wetlands could temporarily support a distinctive fauna before increasingly severe glacial conditions transformed the island. The later expansion of the British–Irish Ice Sheet was not merely a climatic episode; it was an archaeological filter, eroding landscapes and helping to erase the traces of any earlier human visits.

For that reason, Mammoth Cave’s uncertain passage matters. Castlepook and Derryvree do not provide an anniversary, a ruler or a battle. They offer something more appropriate to the period: fragmentary but material testimony from bones, pollen, insects, organic mud and glacial sediments. Together they show that Ireland near this modernly numbered date was neither historical empty space nor a settled prehistoric homeland. It was a cold, changing frontier of animals, wetlands and advancing ice, with the possibility—still unproven in full—that people briefly entered its story.

Chapter 065 of 100

31236 BCE

Bogbean Between the Drumlins [65]



31,236 BCE is a modern chronological label, not a date that can be matched to a recorded Irish event. No people in Ireland counted years in this fashion, and neither archaeology nor Quaternary science can identify a particular hunt, journey or season at such depth in time. In radiocarbon convention, the label falls roughly 33,185 years before AD 1950. That places it within the Late Pleistocene, in Marine Isotope Stage 3 (MIS 3), a highly variable part of the last Ice Age. The responsible subject is therefore an environmental and archaeological horizon, not an annual chronicle.

The evidence closest to this notional year is fragmentary but valuable. It comes chiefly from sediments exposed at Derryvree near Maguiresbridge in County Fermanagh, from animal remains preserved in southern limestone caves, and from wider reconstructions of the British–Irish Ice Sheet. Together they show that parts of Ireland experienced cold, open and locally waterlogged conditions before the fullest expansion of the last ice sheet. They do not supply evidence for a state, a tribe, named leaders, settlements or a continuous resident population.

A Date Within Broad Ranges

The key difficulty is chronological precision. Organic material from Derryvree produced the legacy radiocarbon determination BIRM-166, conventionally reported as 30,500 ± 1,100 radiocarbon years BP. A radiocarbon age is not itself a calendar age: atmospheric carbon-14 has fluctuated, so measurements must be calibrated against independently dated records. At more than 30,000 years ago, the calibration curve and the sizeable error on the original assay yield a broad probability range, not a single date. One published calibration places the Derryvree material broadly between about 36,900 and 31,700 calibrated years BP, or approximately 34,950–29,750 BCE.

That range overlaps the general horizon represented by 31,236 BCE, but it does not mean that the Derryvree pool existed in that exact year. Nor does it turn the numbered year into a historical anniversary. It permits a narrower and more useful conclusion: Derryvree provides direct evidence for an Irish cold-stage freshwater environment during the later part of MIS 3. The sequence is especially important because later glacial erosion destroyed or disturbed much of the island's older landscape record.

Freshwater Under Future Ice

Roadworks in 1969 cut through a drumlin at Derryvree and revealed a striking sequence. Fine sands, freshwater silts and organic sediments lay trapped between two layers of till, the unsorted mixture of clay, stones and debris laid down by glacier ice. The order of deposition establishes an essential point. Ice crossed the locality before the organic beds formed; later, a non-glacial interval allowed water, sediment, plants and small animal remains to accumulate; then another ice advance sealed the deposit beneath fresh till.

This is evidence for change rather than for a uniformly frozen island. Derryvree cannot serve as a weather station for every Irish region, and the ice histories of uplands, lowlands, coasts and the continental shelf need not have been identical. Yet the freshwater deposits rule out the simplest picture of Ireland as continuously buried beneath ice throughout the last Ice Age. Around the broad period in question, at least one Fermanagh basin supported standing or slow-moving water and vegetation before it was incorporated into the longer story of renewed glaciation.

The subsequent Last Glacial Maximum came later. Modern reconstructions of the British–Irish Ice Sheet indicate substantial growth from roughly 31,000 to 26,000 years ago, with maximum ice volume around 23,000 years ago; particular Irish sectors reached shelf-edge positions at different times. Thus 31,236 BCE belongs near the onset of a major phase of ice-sheet expansion, not securely within the island-wide maximum. It was a world in motion, where local ice margins, frozen ground, meltwater and changing drainage could alter the usable landscape over long human timescales.

Tundra, Wet Ground and Short Summers

Plant macrofossils, pollen and insect evidence from Derryvree describe a largely treeless, periglacial landscape. The old term *muskeg*, used in the original discussion, conveys the likely character of parts of the site: wet, peaty, moss-rich ground, with sedges and shallow pools. Fossils include plants associated with cold environments, among them bogbean, dwarf willow and mountain-avens. These are not decorative details. They demonstrate that hardy vegetation could occupy sheltered, wet or seasonally thawed places even in a severe climatic regime.

The wider ground was probably open rather than forested. Grasses, sedges, herbs, mosses and low shrubs would have made a patchwork determined by drainage, soil, exposure and snow cover. Long winters, frost action and short growing seasons limited tree growth. It would be wrong, however, to imagine a featureless white desert. The Derryvree evidence instead suggests ecological variation: open water, saturated margins, vegetated patches and mineral ground, all within a cold landscape. The exact annual temperatures, snowfall and seasonal calendar cannot be recovered for 31,236 BCE.

MIS 3 was climatically unstable across the North Atlantic world. Greenland ice cores register repeated abrupt shifts between colder stadials and relatively milder interstadials. Irish deposits do not possess the annual resolution needed to match Derryvree confidently to one of those individual shifts.

They do show why a static reconstruction is misleading. A landscape that could support freshwater plants and insects during one interval might later be overridden by ice or reshaped by permafrost and meltwater.

Animals on the Western Margin

Southern Irish caves provide the principal evidence for larger animals in this deeper past, especially Castlepook Cave near Doneraile in north County Cork, once known as Mammoth Cave. Collections from the cave include remains assigned to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Re-dating has confirmed that important elements of the Castlepook fauna belong to MIS 3, well before the Last Glacial Maximum.

These bones establish that Ireland was accessible to a changing range of mammals during parts of the period. Reindeer in particular fit an open, cold-country environment in which grazing and browsing were available. Carnivores and scavengers show that carcasses and caves belonged to complex food webs rather than to an untouched wilderness. But the assemblage must not be read as a single photograph of one day. Cave deposits can mix material accumulated over millennia, while water, animal activity and early excavation have disturbed their original contexts. Not every listed species necessarily met at Castlepook, much less in 31,236 BCE.

Nor should the presence of mammoths or hyaenas be used to claim a simple land bridge, a fixed migration corridor or a known coastline. Sea level was lower than today and the geography of the Irish Sea region was profoundly different, but routes changed with ice, sea, rivers and terrain. Faunal evidence supports connectivity with the wider north-west European world; it cannot map a precise route across landscapes now submerged or altered.

The Human Question

The most provocative evidence is a reindeer femur from Castlepook carrying a deep mark interpreted by zooarchaeologist Ruth Carden as a stone-tool cut made during carcass processing. Public reporting and County Cork heritage material associate the specimen with an age of about 33,000 years. If the mark is genuinely anthropogenic and contemporary with the bone, it would indicate that one or more Upper Palaeolithic people handled a reindeer in Ireland during MIS 3.

That possibility matters, but it remains far short of proof of settlement. The bone derives from an old cave collection rather than a securely excavated occupation floor. No associated hearth, lithic assemblage, dwelling, burial, food store or concentrated butchery area of comparable age has yet demonstrated an established community at Castlepook. Modern excavation has sought undisturbed deposits precisely because the older collection cannot answer all these questions. The National Museum of Ireland’s long-standing caution that clear Palaeolithic occupation has not yet been demonstrated remains an important counterweight to dramatic claims.

The safest distinction is between evidence and interpretation. A dated reindeer bone is evidence for a reindeer. A surface incision judged consistent with stone-tool use is evidence requiring specialist taphonomic assessment. From it, scholars may reasonably propose a brief human encounter with an animal, but cannot establish the size, language, ancestry, duration or fate of any visiting group. It certainly cannot demonstrate an unbroken human population leading to later Irish communities.

No Polities, No Recorded Beliefs

There is no evidence from Ireland around this horizon for political institutions, diplomacy, warfare, territorial lordship, formal trade networks, religious monuments, writing or named cultural groups. It would be misleading to populate this date with chieftains, clans or “Celtic” ancestors. Those categories belong to vastly later periods. Even the existence of people on the island at this moment remains possible rather than securely established.

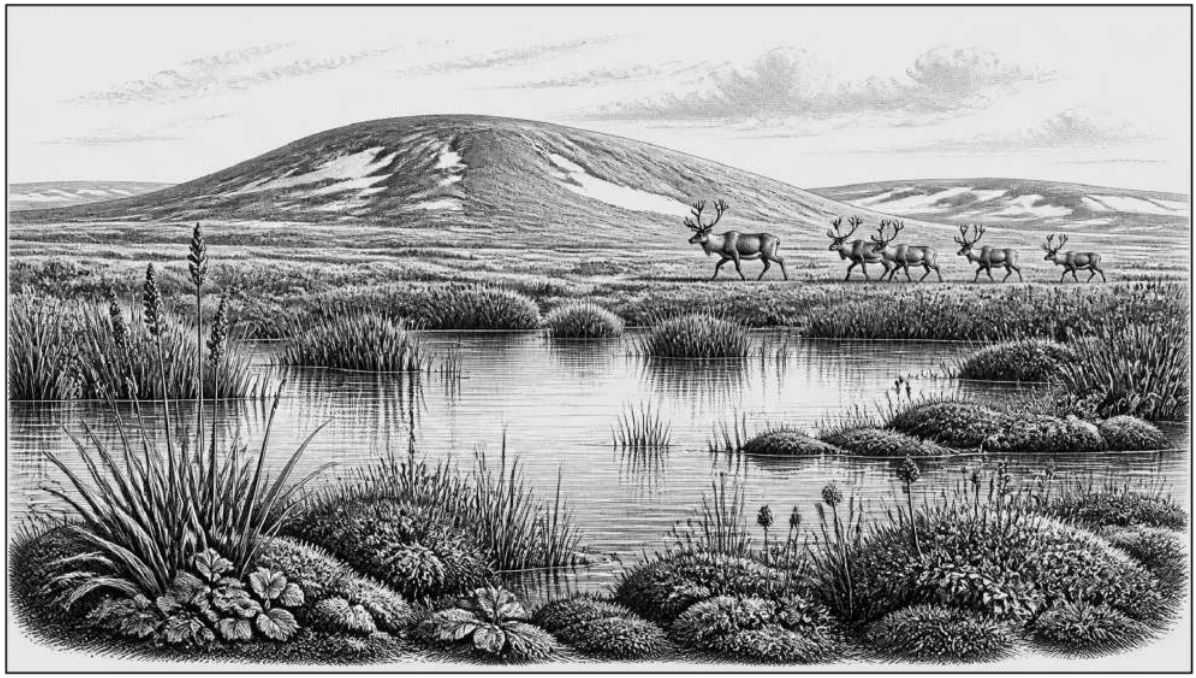
If small Upper Palaeolithic parties did reach Ireland, comparison with better-documented groups elsewhere in Europe suggests mobile foraging rather than villages or farming. Such an inference should remain external context, not a description of a proven Irish society. Elsewhere, people made sophisticated stone and organic tools, wore tailored clothing, maintained long-distance social ties and sometimes created ornaments and art. Ireland has not yielded an assemblage of this date that allows those practices to be claimed locally.

What can responsibly be said is both more modest and more remarkable. At the western edge of Ice Age Europe, freshwater life persisted between episodes of glaciation; tundra plants rooted in wet ground; cold-adapted animals ranged across open country; and one cave collection raises the unresolved possibility of human presence. The chief historical development around 31,236 BCE was not political change but environmental instability. Derryvree’s bogbean and the sediments enclosing it preserve that deep history: life briefly recorded between the movements of ice.

Chapter 066 of 100

31235 BCE

Derryvree’s Intertill Fen [66]



The label 31,235 BCE is a modern way of locating a point far beyond the reach of annual history. It corresponds approximately to 33,200 calibrated years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3. No Irish person could have named this year; there was no writing, calendar, state or continuous archaeological sequence from which an event can be assigned to it. Modern calendar-year precision is not available. The responsible subject is therefore an environmental interval, reconstructed from deposits, fossils and ice-sheet evidence, rather than an imagined episode in a numbered year.

The closest important Irish evidence is the Derryvree sequence near Maguiresbridge in County Fermanagh. During roadworks in 1969, a cutting exposed fine freshwater sands, silts and organic material enclosed between two thick layers of till, the unsorted debris laid down by glacier ice. Organic material from the freshwater bed produced the radiocarbon determination Birm-166, 30,500 +1,170/−1,030 radiocarbon years BP. Calibration places that result broadly around 36,900–31,700 calibrated years BP, or roughly 34,950–29,750 BCE. The modern date in question falls within this wide range, but cannot be pinned to a particular layer, season, animal or human action within it.

A Landscape Between Ice Advances

Derryvree’s value lies first in its order of deposits. An earlier glacier left the lower till. Afterwards, local ice had withdrawn or ceased to occupy this ground long enough for water to collect and for silt, plants and insects to accumulate. A later glacial advance overran and sealed the basin beneath an upper till. This is firm relative evidence for change at one Fermanagh locality: it was not continuously covered by ice throughout the relevant cold-stage interval. It is not proof that every part of Ireland was ice-free at the same time, nor that the whole island had one climate or one surface.

That distinction matters because the British–Irish Ice Sheet was neither static nor uniform. It grew and reorganised across a landscape of mountains, basins and marine channels. The great Last Glacial Maximum, when ice extended across all Ireland and far onto the adjacent continental shelf, came later, chiefly around 27,000–23,000 calibrated years BP. At about 33,200 cal BP, the island was moving through a colder and highly variable glacial world before that maximum. Regional ice margins could advance, thin or retreat at different times. A sheltered wet hollow in south Fermanagh may therefore record conditions unavailable on an exposed upland or beneath an active glacier elsewhere.

The familiar rounded drumlins of Ireland make this history unusually tangible. At Derryvree, the drumlin was not simply a feature of the modern countryside: its glacial sediments both recorded successive ice movements and protected a fragile earlier wetland archive. Later ice destroyed or obscured much of the preceding land surface, but here it also buried the evidence deeply enough for it to survive. The result is a small, precious window rather than a panoramic view.

Cold Water, Low Plants

The biological remains point to an open, severe environment. Pollen was poorly preserved, yet it was predominantly herbaceous. Plant macrofossils included mosses and species associated with cold, wet ground, among them bogbean, mountain-avens and lesser clubmoss; aquatic or waterside plants such as water-milfoil add to the evidence for freshwater. Insect remains also have a cold northern aspect. Taken with the sediments, these finds support the interpretation of a tundra or muskeg-like setting: treeless or nearly treeless ground, shallow pools and waterlogged margins, grasses, sedges, herbs and low shrubs, shaped by frost and seasonal thaw.

“Tundra” is a useful shorthand, but not a picture of an unbroken snowfield. Derryvree indicates living freshwater habitats during at least part of the year. Mosses and aquatic plants grew where water lingered; sedges and herbs occupied saturated edges; exposed mineral ground and low vegetation lay beyond. The short growing season would have been crucial. Winters were long and harsh, while freezing and thawing repeatedly disrupted soil, drainage and vegetation. A few grains of pine or hazel pollen cannot securely demonstrate nearby woodland, since pollen travels and may be redeposited. The strongest local signal remains that of open, cold country.

This was also a changing North Atlantic climate. Marine Isotope Stage 3 was characterised by abrupt climatic oscillations recorded especially clearly in Greenland ice cores and North Atlantic sediments. The Derryvree deposit cannot be correlated to a particular warm pulse or cold pulse with year-by-year certainty. Nevertheless, its position between tills demonstrates that Irish environmental history was episodic: water and vegetation could establish themselves during an interval that was later overwhelmed by renewed ice. The real history is not a single frozen Ireland, but recurrent transformations of ice, water, ground and habitat.

Animals in the Open Country

Other Irish sites help show what kinds of animals could inhabit or visit such landscapes, although they must not be treated as a census for Fermanagh in one precise year. Castlepook Cave near Doneraile, County Cork, is particularly important. Its old collections include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Improved radiocarbon

methods have shown that several southern Irish cave specimens are substantially older than earlier laboratory results suggested, placing significant faunal activity in Marine Isotope Stage 3 and indicating that some species may have disappeared locally before the Last Glacial Maximum.

The collection reflects ecological opportunities rather than a harmonious herd. Reindeer and giant deer browsed or grazed across open habitats; mammoths, where present, belonged to the wider mammoth-steppe world of Pleistocene Europe; wolves and hyaenas competed for prey and carrion. Caves could be shelters, predator dens, traps for bones or places where sediment and remains were washed in. Consequently, Castlepook's bones show that Ireland supported, at intervals, a striking range of large mammals and carnivores. They do not show that all species met one another, or were alive together, at exactly 31,235 BCE.

The evidence also overturns any assumption that a cold-stage Ireland was biologically empty. It was harsh and probably patchy, but it could sustain food webs of plants, invertebrates, herbivores, scavengers and predators. Wetlands such as Derryvree's were part of that wider mosaic. Their productivity would have varied sharply by season, water level and temperature. Animals may have moved through favourable corridors and withdrawn as conditions deteriorated; their presence in Irish deposits is evidence of successful arrival, not necessarily of uninterrupted residence.

The Unsettled Human Question

There is no securely excavated settlement, hearth, dwelling floor, burial, stone-tool assemblage or art site that permits a confident account of people living in Ireland at this date. Nor is there evidence for a named people, language, kingship, warfare, diplomacy, religion, farming, exchange network or formal learning. Political and cultural headings appropriate to later history must therefore remain blank. To call any possible visitors "Irish" in an ethnic or national sense would impose identities formed immeasurably later.

One object nevertheless makes the question important. A reindeer femur from Castlepook Cave has been reported as bearing marks consistent with fresh-bone cutting or chopping by a stone implement, and the animal has been publicised as dating to roughly 33,000 years ago. If specialist analysis confirms both that the mark is anthropogenic and that it relates to the animal's death, it would indicate that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland during the broad period represented here. That would be a major extension of the island's human record.

It would still not prove permanent settlement. The bone came from an antiquarian cave collection, not from a modern excavation of an undisturbed occupation surface with associated tools and charcoal. Carnivore damage, trampling, sediment abrasion, breakage and excavation damage can complicate the interpretation of bone marks. Recent excavation at Castlepook has located surviving deposits but has not produced a securely stratified Palaeolithic camp. The most defensible formulation is that a very early human incursion is possible and consequential, while sustained human occupation around 31,235 BCE remains unproven.

If people did briefly reach Ireland, their livelihood cannot be reconstructed directly from Irish evidence. By analogy with Upper Palaeolithic groups elsewhere in north-west Europe, small mobile parties could have relied on detailed knowledge of weather, animal movement, hides, fuel and seasonal resources. But analogy is not evidence. Ireland's lower sea levels exposed additional shelf land, yet its deep surrounding channels meant that access, routes and water crossings remain difficult questions. No

boat, camp or crossing route has survived from this period. The environmental archive establishes potential landscapes and animal resources; it does not establish the plans, beliefs or social organisation of any people who may have entered them.

What This Date Can Mean

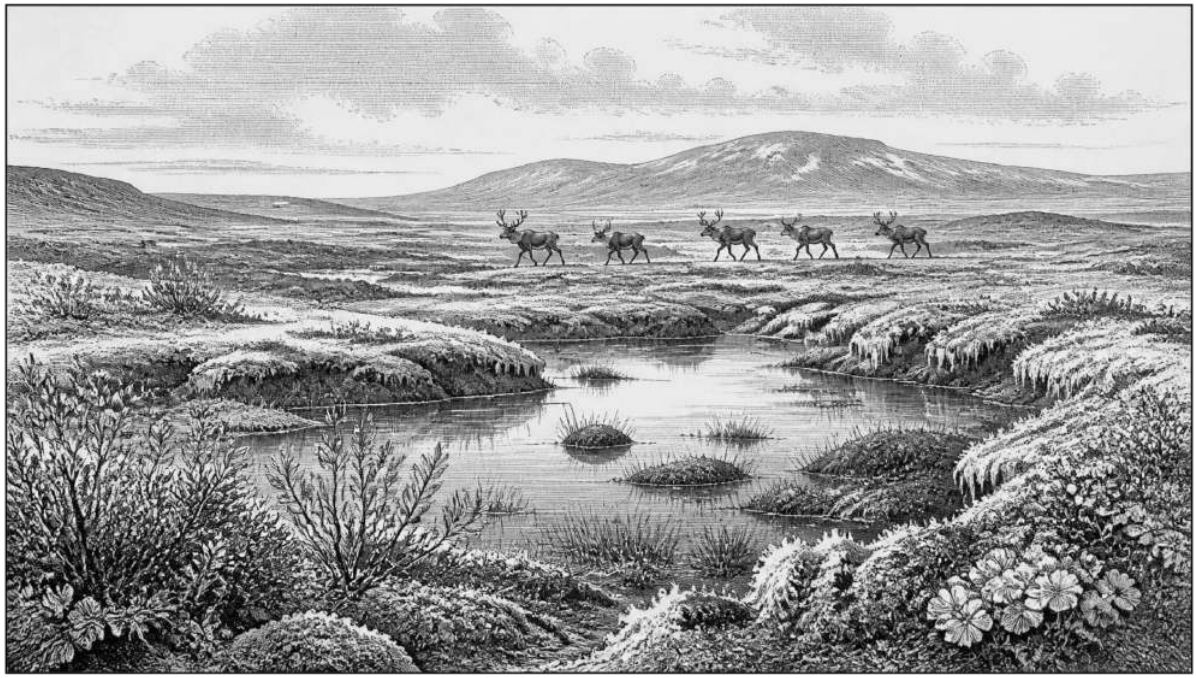
For this point in deep time, Ireland’s history is best told through thresholds. At Derryvree, water, plants and invertebrates occupied a basin between episodes of glaciation. Across the island, cave faunas show that cold-adapted mammals and formidable predators could live in, or move through, open Pleistocene habitats. At Castlepook, a potentially modified reindeer bone raises the prospect of a fleeting human encounter, but not a demonstrable community. Later ice advance reshaped the land and erased much of what might once have existed.

Thus 31,235 BCE is not an anniversary. It is a useful modern marker within a calibrated range, illuminating an Ireland of periglacial wetlands, open vegetation, shifting ice margins and mobile animal communities. Its most important lesson is methodological as well as historical: sediments can show an ice-free interval, fossils can show former life, and a marked bone can pose an extraordinary question. None allows a responsible historian to invent a year-specific event where the evidence offers only a deep, changing landscape.

Chapter 067 of 100

31234 BCE

Derryvree’s Organic Interlude [67]



The label 31,234 BCE is a modern point on a timescale, not a year that can be recovered from Ireland’s prehistoric evidence. It corresponds roughly to 33,183 years before AD 1950, the reference point used for “BP” dates. No one in Ireland recorded a calendar, named a season or left an event that can be assigned to this particular year. Radiocarbon measurements at this depth of time carry substantial uncertainties and must be calibrated; deposits also accumulated over spans of time rather than in a single moment. The responsible history of this notional year is therefore a history of a broad Late Pleistocene landscape, not an annual chronicle.

That landscape belonged to Marine Isotope Stage 3, a fluctuating interval of the last Ice Age. Ireland was moving towards the major expansion of the British–Irish Ice Sheet, but conditions were neither uniform across the island nor stable from millennium to millennium. The best evidence relevant to this point comes from preserved sediments, fossil plants and insects, cave faunas, and the geological record of ice movement. These sources say much about climate and habitats. They say very little, and often nothing securely, about human communities, institutions or beliefs.

A Date Framed by Uncertainty

The key Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a remarkable sequence: organic freshwater silts and fine sands enclosed between two thick, distinct sheets of till. Till is debris deposited by glacier ice. The sequence therefore provides firm relative evidence for three broad stages at that place: an earlier ice advance, a subsequent interval in which freshwater sediment and organic material accumulated, and a later advance that buried the deposit beneath new glacial debris.

Organic matter from the Derryvree bed, laboratory code BIRM-166, gave a conventional radiocarbon age of 30,500 years BP, with an uncertainty of +1,170 and −1,030 years. Such a result is not equivalent to a calendar date. Modern calibration curves translate radiocarbon ages into wider ranges of possible calendar ages, and the uncertainty increases further back in time. Derryvree is consequently a valuable chronological anchor for a cold, non-glacial phase in late MIS 3, but it cannot demonstrate that a particular pool, plant or animal was present in the numerical year 31,234 BCE. Nor can a site in south Fermanagh be made a simple weather report for all of Ireland.

Older terminology sometimes called this interval the “Derryvree Cold Phase” or even an interstadial. The terminology reflects the problem: the site shows that its locality was not covered by glacier ice while the organic bed formed, yet its biological evidence indicates severe cold rather than a warm wooded interlude. Current ice-sheet research likewise stresses that ice growth and retreat around Ireland and Britain were asynchronous. An ice margin could be advancing in one sector while another area retained ice-free ground, freshwater basins or a different local climate. Around this date, change rather than uniformity is the central fact.

A Treeless Wetland in Fermanagh

Derryvree’s plant and insect remains offer the clearest view of everyday ecology. The sediments held freshwater mosses and sedges, pollen dominated by herbs, and macrofossils of cold-adapted plants. These include mountain-avens (*Dryas octopetala*), dwarf willow (*Salix herbacea*), lesser clubmoss (*Selaginella selaginoides*) and bogbean (*Menyanthes trifoliata*); water-milfoil pollen also points to aquatic vegetation. Together they support the interpretation of a largely treeless, tundra-like wetland, perhaps resembling muskeg: saturated ground rich in moss and sedge, broken by shallow open water.

That reconstruction is evidence-based, but it still has limits. Pollen travelled on wind and was poorly preserved in parts of the deposit. A few grains from trees or shrubs need not mean that woodland stood beside the water. The stronger conclusion is negative as well as positive: Derryvree was not the later Irish landscape of oak, hazel woodland, enclosed fields and peat bogs. Its growing season was short; winters were harsh; frost, frozen ground and snowmelt would have shaped the soil and watercourses. The insect fauna supports a cold northern, periglacial setting. “Periglacial” need not mean that an ice front was always visible from the site, but that frost-driven processes and intense seasonality governed life.

This was nevertheless a living habitat, not a featureless desert. Shallow pools could sustain aquatic plants; damp margins held sedges and mosses; better-drained patches supported hardy herbs and low shrubs. Summer light in this northern latitude could encourage a brief burst of growth, while winter brought an altogether different world. Such patchiness matters because it offered food and shelter to insects, small animals and, where conditions allowed, larger grazing mammals. The Derryvree bed records a local ecological refuge between episodes of ice advance, preserved precisely because later ice sealed it.

Cork’s Cave Fauna

County Cork supplies a different form of evidence. Castlepook Cave, near Doneraile, has yielded Ireland’s richest known pre-Last Glacial Maximum cave fauna. Old excavations and more recent investigations have produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf or fox, mountain hare and lemmings. Revised radiocarbon work has shown that

several older dates from Irish cave collections required reassessment, and it places important Castlepook material within MIS 3. The cave is therefore directly relevant to the broad period, though not a snapshot of one perfectly contemporaneous animal community.

Its contents accumulated through complicated processes. Carnivores could drag carcass parts into caves; animals might die in or near entrances; water and sediment could move bones; early twentieth-century excavation disturbed and dispersed deposits. A mammoth bone and hyaena evidence demonstrate that large carcasses and predators were part of the wider ecological story, but they do not prove that mammoths, hyaenas, reindeer and every other recorded species stood together in north Cork at the same time. The important conclusion is more restrained: parts of Ireland could at intervals be reached by a cold-stage fauna of considerable diversity.

Animal movement also indicates that Ireland was not ecologically sealed off for the whole period. Lower global sea levels transformed surrounding shelves, while ice, water and changing coastlines made routes to Britain and continental Europe variable and difficult to reconstruct. Faunal connections are real evidence for dispersal, but they are not evidence for a permanent, dry land bridge at 31,234 BCE. Nor can they establish a human route. Any crossing or connection must be treated as a changing geographical problem, not drawn as a fixed line on a modern map.

The Human Question

Castlepook has sharpened the question of whether people briefly reached Ireland in this cold phase. A reindeer femur from an old cave collection has been reported as dating to around 33,000 years ago and bears a deep incision interpreted by specialist examination as a cut made with a sharp stone edge during butchery. If that identification and its association with the death of the animal are sustained, the bone would be striking evidence that Upper Palaeolithic people handled reindeer in Ireland far earlier than the formerly accepted terminal-Pleistocene evidence.

Yet the distinction between evidence and interpretation is essential. The date establishes the antiquity of the animal bone, not the date of a visit in one particular BCE year. The incision is a taphonomic judgement about the process that altered its surface. Crucially, the bone was not recovered from a modern excavation of an intact hearth, floor or camp containing stone tools, food waste and securely associated human activity. It cannot establish a resident population, a settlement at Castlepook, the size or identity of a visiting party, or continuity of occupation. Fresh excavation, further direct dating and microscopic study are needed to test the case.

No Politics, No Trade, No Named Culture

For Ireland around this date, there is no evidence for political affairs, diplomacy, warfare, chiefs, territories, long-distance trade or formal exchange. There are no houses, graves, ritual monuments, artworks, written words or securely identified tool assemblages from which religion, language, learning or social hierarchy can responsibly be reconstructed. If people did enter the island, they may have done so as highly mobile hunter-gatherers exploiting animals and seasonal landscapes, as elsewhere in Upper Palaeolithic Europe. That is a reasonable comparative possibility, not a demonstrated Irish settlement pattern.

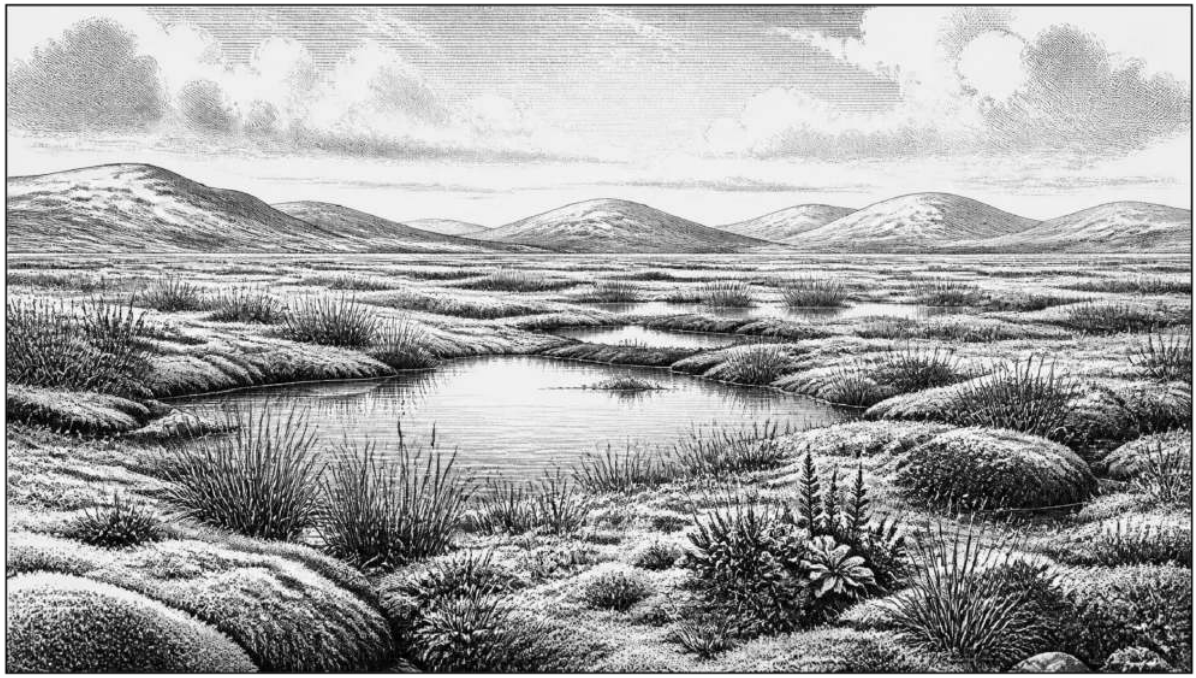
The economy that can be securely described is ecological: plants colonised wet ground, insects occupied pools and mosses, and large mammals moved through open country when routes and habitats permitted. The most important development around the modern label 31,234 BCE was the instability of

this environment. A cold wetland at Derryvree survived between glacial episodes; animals ranging from reindeer to hyaena reached the island at broadly comparable stages of the Ice Age; and expanding ice would later overwrite much of this fragile record. Ireland’s history here is not yet a history of nations or named peoples. It is the deeper history of survival, mobility and an increasingly glaciated Atlantic-edge world.

Chapter 068 of 100

31233 BCE

Derryvree’s Sealed Muskeg [68]



The label 31,233 BCE cannot denote a dated Irish event in the ordinary historical sense. No written record, ruler, settlement, battle or ceremony can be assigned to that calendar year, and modern calendar-year precision is unavailable at this depth of time. Instead, the date falls within the Late Pleistocene, broadly Marine Isotope Stage 3 and the Middle Midlandian sequence used in Irish Quaternary studies. The responsible history of Ireland at this point is therefore an account of evidence: waterlogged sediments, pollen, plant fragments, insects, animal bones, cave deposits and the traces left by advancing ice.

The most valuable Irish evidence for the general period comes not from a human site but from Derryvree, near Maguiresbridge in County Fermanagh. There, a road cutting exposed organic freshwater silts and fine sands enclosed between two sheets of glacial till. This sequence is exceptionally important. The lower till shows that glacier ice had occupied the locality; the freshwater deposits prove that ice was absent there for a time; and the upper till records a later return or expansion of ice. It preserves a changing environment rather than a single moment, but it offers a rare view of an Irish landscape that later glaciation largely erased.

A Date Within a Range

The Derryvree organic material produced a conventional radiocarbon determination of about 30,500 ± 1,100 radiocarbon years before present. Later calibration places the result broadly between about 36,900 and 31,700 calibrated years before present, approximately 34,950–29,750 BCE. The notional year 31,233 BCE falls within that broad span. This overlap makes Derryvree relevant, but it does not establish that a

particular seed, beetle or pool belonged to 31,233 BCE itself. Radiocarbon results of this age have wide uncertainties; a sediment bed can also represent accumulation over generations or centuries. The evidence supports a period picture, not an annual chronicle.

That distinction matters particularly in Ireland, where the physical record of the Ice Age is fragmentary. Ice sheets eroded older ground surfaces, reworked deposits and buried others under till. The later maximum of the British–Irish Ice Sheet was still to come. Current syntheses indicate a complex and regionally uneven expansion, with ice-sheet growth and advance occurring over a long interval after roughly 34,000 years ago; maximum ice volume and extensive shelf-edge advances belong principally to the later Last Glacial Maximum. It would therefore be wrong to picture all of Ireland as either uniformly ice-free or uniformly entombed beneath its greatest ice cover in 31,233 BCE.

Freshwater Between the Tills

Derryvree instead indicates an open, cold and biologically active setting in north-central Ireland during part of this wider interval. Pollen, plant macrofossils, mosses and insect remains have been interpreted as evidence for treeless tundra and muskeg: wet, peaty terrain with sedges and mosses, shallow freshwater pools, plant-rich margins and frost-affected ground. Finds associated with the deposit include bogbean, a plant of wet ground, alongside plants suited to exposed, cold conditions. Such evidence does not conjure a gentle modern wetland. Winters were likely long and severe, growing seasons brief, and drainage strongly influenced by freezing and thawing.

Yet this was not a lifeless wasteland. The silts show that water stood or moved slowly enough for fine sediment and organic material to accumulate. Insects, aquatic and wet-ground plants, and mosses formed a functioning local ecology. The wider landscape was probably largely open, without the dense oak, elm and hazel woodland familiar from much later Irish prehistory. Wind, seasonal snow, permafrost or seasonally frozen ground, and sharply changing water levels would have shaped the available habitats. In sheltered basins, however, summer thaw permitted pools and vegetation to persist.

The word *muskeg* is an interpretation, not an ancient Irish name for a landscape. It is useful because it conveys waterlogged, mossy and sedge-rich ground broken by open water, but it should not imply that every part of Fermanagh was identical. Derryvree records one protected sedimentary basin. Its value lies in demonstrating that at least one locality supported freshwater life between glacial episodes, not in providing a complete map of the island’s climate or vegetation.

The Castlepook Animal World

County Cork provides another, very different window on the same broad Ice Age world. Castlepook Cave, near Doneraile, yielded a remarkable assemblage of Pleistocene animal remains during early excavations. The material includes reindeer, woolly mammoth, giant deer, spotted hyaena, brown bear, wolf, foxes, hares and lemmings. Taken carefully, the assemblage establishes that a rich mixture of cold-stage and open-country mammals reached Ireland during the later Pleistocene. Reindeer in particular suit an open landscape of grasses, herbs and low vegetation, while hyaena, wolf and bear point to a food web containing both large herbivores and major predators.

But a cave collection is not a census from one season. Bones may have entered Castlepook through carnivore activity, natural deaths, water movement, collapse, repeated occupation of the cave by animals, and excavation practices that pre-dated modern recording standards. Nor should every species in the collection be treated as contemporary. Some older radiocarbon dates were used to place parts of the fauna

broadly in the Derryvree cold-phase interval, but recent work across Irish cave assemblages has shown how important direct redating, taphonomic study and secure excavation contexts are. Castlepook is powerful evidence for Ice Age fauna, but a complicated archive for fine chronology.

A Human Trace, Not a Settlement

Castlepook has acquired particular significance because a reindeer femur in the National Museum of Ireland's Natural History collection bears a deep mark interpreted by palaeozoologist Ruth Carden as a cut or chop made by a sharp stone tool while the bone was fresh. County Cork heritage publications have presented the bone as being about 33,000 years old. If the mark is correctly identified, it may be the earliest known indication that people handled an animal in Ireland, vastly earlier than the island's better-established terminal-Pleistocene human evidence.

The qualification is essential. The marked bone is not a house floor, hearth, tool-kit, burial, camp, fish trap or repeatedly occupied hunting station. Its date concerns the animal bone rather than a named human action in a particular year, and the old cave collection does not provide the secure associated context that archaeologists would seek today. The mark is a serious and exciting claim, now helping to direct renewed investigation at Castlepook, but it cannot responsibly be converted into a story of a named hunting party or a settled population in 31,233 BCE.

Accordingly, political affairs, diplomacy and organised conflict are beyond the evidence. There are no identifiable communities, territories, leaders or alliances. Nor is there evidence for religion, formal learning, art, exchange networks, farming or permanent settlement in Ireland at this date. If people did enter or visit the island intermittently, they would have belonged to the wider Upper Palaeolithic world of mobile hunter-gatherers in north-west Europe; but that is a contextual possibility, not a securely demonstrated Irish social system. A cut-mark, if accepted, indicates carcass processing. It does not demonstrate population size, language, belief or long-term residence.

Routes, Coasts and Survival

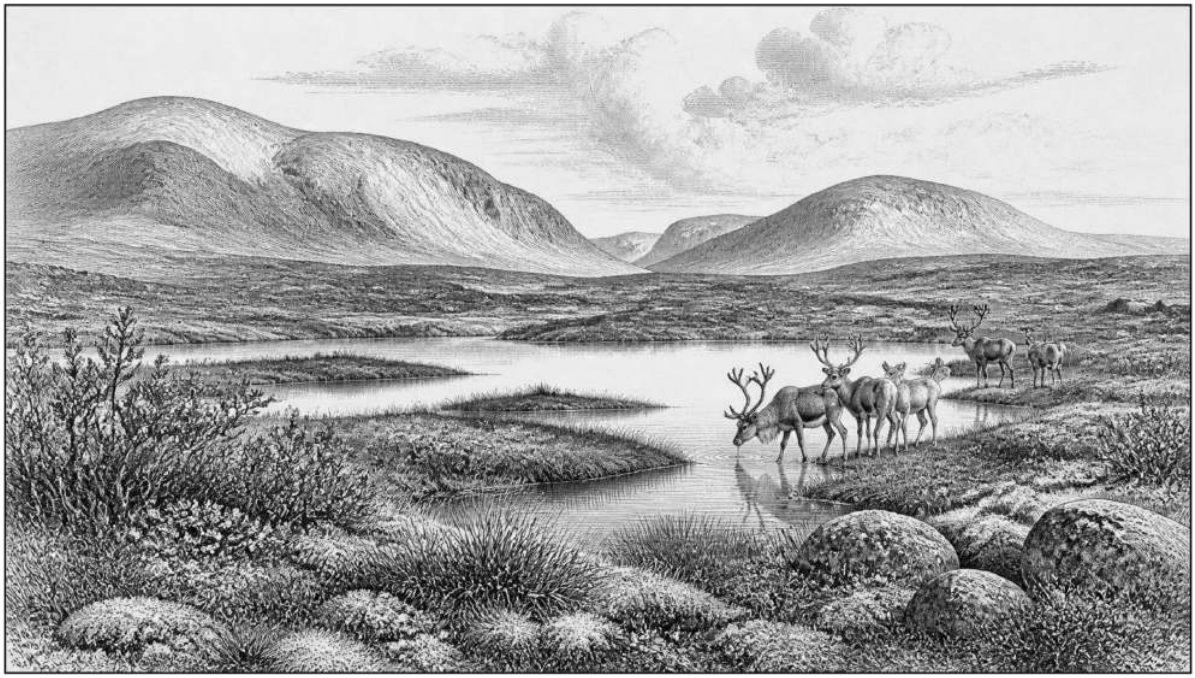
Lower global sea level altered the geography of north-west Europe, but it does not license an easy claim that Ireland was simply joined to Britain or the Continent at this exact time. The routes by which animals reached the island remain a major biogeographical question, dependent on fluctuating sea levels, ice margins, short-lived connections, coastlines now submerged and the capacities of different species. The mammal record proves dispersal during parts of the Late Pleistocene; it does not reveal a particular route used in 31,233 BCE. For humans, the absence of known camps may reflect genuine rarity, later destruction by ice and sea, or the limited survival and discovery of sites.

The principal development around this date was therefore environmental. Ireland was a changeable northern landscape on the approach to more extensive glaciation: in some places ice-free enough for wetlands, tundra vegetation and large mammals; elsewhere shaped by expanding ice, cold seas and unstable ground. Derryvree's freshwater bed and Castlepook's bones are complementary records. One preserves a local wetland ecology; the other preserves fragments of a wider animal world and a possible human intervention. Together they replace the false image of a wholly blank Ice Age Ireland with a more compelling but cautious one: a difficult, open country in which life persisted, moved and occasionally left traces that later ice did not wholly destroy.

Chapter 069 of 100

31232 BCE

Derryvree’s Periglacial Lake [69]



The label 31,232 BCE is a modern way of counting backwards, not a date at which Ireland’s archaeological record can identify an event, a ruler or even a single season. For this depth of time, modern calendar-year precision is unavailable. The relevant evidence belongs broadly to the Late Pleistocene, within Marine Isotope Stage 3, and is dated in ranges derived from radiocarbon measurements, calibration and stratigraphic relationships. The most illuminating Irish record is not a settlement but a buried freshwater deposit at Derryvree near Maguiresbridge, County Fermanagh. It offers a rare glimpse of an ice-age landscape during an interval when that locality was free of glacier ice.

A Date Inside a Range

Derryvree was exposed by roadworks in 1969, when a cut through a drumlin revealed organic silts and fine sands between two thick layers of till, the unsorted sediment left by moving ice. The sequence is unusually eloquent. First came glaciation, represented by the lower till; then an interval in which freshwater sediment, plants and insects accumulated; later, ice again crossed the ground and laid down the upper till. It records environmental change on a grand scale, but not an annual diary.

Organic material from the freshwater bed produced a conventional radiocarbon age of 30,500 radiocarbon years before present, with a substantial uncertainty. Using modern calibration, scholarship places the deposit broadly at about 36,900–31,700 calibrated years before present. The calendar label 31,232 BCE falls within that wide span, but it cannot be used to date the whole deposit to a particular year. Nor should the Derryvree evidence be treated as a complete map of Ireland. It demonstrates that this part of Fermanagh experienced an ice-free interval; it does not prove that every region of the island was simultaneously open, habitable or alike.

This caution matters because the last glacial cycle was neither a single unbroken freeze nor a steady march towards colder weather. North Atlantic climates shifted sharply between relatively milder interstadials and severe stadials, sometimes over timescales far shorter than the span represented by an archaeological period. Ireland lay at the Atlantic edge of this unstable world. Ice sheets grew, altered their flow and later reached their greatest late-glacial extent after the period considered here. Around 31,232 BCE, the decisive historical force was therefore climate: it determined where water could remain liquid, which plants could grow, where animals could feed, and whether people could travel through or survive in the region.

An Open, Cold Wetland

The fossils at Derryvree point to a treeless tundra and periglacial environment rather than woodland, farmland or a familiar Irish bog. Mosses, sedges, aquatic plants and small invertebrates indicate wet ground with shallow pools and plentiful plant matter: a muskeg-like wetland in a cold open landscape. The recorded flora included bogbean, water-milfoil, dwarf willow, mountain-avens, Arctic-alpine plants and grasses or herbs adapted to exposed conditions. Beetle remains are especially valuable because many insects have tightly defined ecological requirements. Together, plant and insect evidence suggests a landscape with standing or slowly moving freshwater, mossy margins and low vegetation, subjected to long cold winters.

That reconstruction is evidence-based, but it has limits. The silts preserve organisms from a particular basin and its catchment, not every hillside or coast. A wet hollow may have supported plants absent from nearby drier ground. Likewise, the presence of cold-adapted species shows that severe conditions prevailed locally; it does not supply exact temperatures for 31,232 BCE. Nonetheless, Derryvree decisively counters any image of a uniformly lifeless Ireland. Where ice had withdrawn or had not advanced, water, vegetation and insects formed functioning ecosystems. These were sparse northern communities, but they were communities of living things.

Animals at the Atlantic Margin

Caves and museum collections add a different kind of evidence. The Irish Quaternary Fauna Project showed that a varied mammal fauna reached Ireland at intervals between at least about 45,000 and 20,000 years ago. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork is particularly important. Re-dating of bones using improved ultrafiltration methods established that several remains once thought younger were in fact much older, within Marine Isotope Stage 3. The cave assemblage includes animals suited to very different niches and times, among them reindeer, giant deer, woolly mammoth, brown bear, wolf, Arctic fox, lemmings and spotted hyaena.

That list must not be converted into a claim that all these animals stood together on the same day, or that every species was present in every Irish region around this calendar label. Cave bone collections often accumulated over thousands of years. Carnivores can carry prey into caves; water can move bones; animals can die in fissures; and early twentieth-century excavations removed much of the stratigraphic context that modern archaeologists require. The secure conclusion is important enough: during parts of the pre-Last Glacial Maximum, Ireland supported, or was reached by, a substantial cold-stage fauna. Reindeer in particular signal open country with accessible grazing, while hyaena remains remind us that caves could be dens and scavenging places rather than human shelters.

The Castlepook Human Question

The closest possible human connection to this period is a reindeer femur from Castlepook Cave. It has been reported as about 33,000 years old and bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool while fresh tissue was being cut. If that interpretation is sustained, it would provide evidence that people processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the long-established Mesolithic occupation after the final retreat of the ice.

Yet responsible history must preserve the word *if*. The specimen comes from an old cave collection rather than a newly excavated, sealed occupation floor. A radiocarbon determination dates the animal bone, not a named hunter, a camp or the exact moment when its surface was marked. Nor has Ireland produced a securely associated hearth, stone-tool assemblage, dwelling, burial, ornament, artwork or human skeleton of this age. Recent investigations at Castlepook have sought surviving Pleistocene deposits, but the site’s earlier excavation history and complex sediment movement make contextual recovery difficult. The reindeer femur is an exceptionally significant possible trace, not proof of a settled population.

People Without a Recorded Polity

There can be no meaningful account of Irish political affairs, diplomacy, institutions, named communities or warfare for 31,232 BCE. No writing existed in Ireland, and the material record does not identify a polity, boundary or leader. If small groups of Upper Palaeolithic people entered the island, they were almost certainly mobile hunter-gatherers operating within wider north-west European networks, rather than inhabitants of an enduring Irish state or village. This is an inference from the wider European Upper Palaeolithic context, not a fact demonstrated by an Irish camp.

The same distinction applies to everyday life. Reindeer, if processed by people, could have supplied meat, fat, hides, sinew and bone; sharp stone edges were widely used elsewhere in Europe for butchery. But Castlepook’s marked femur cannot reveal whether the animal was hunted, scavenged, butchered at the cave or carried there by a carnivore after people had taken part of the carcass. It tells us nothing certain about family size, language, clothing, beliefs, artistic traditions or routes of travel. A temporary visit during a favourable climatic interval is possible; permanent occupation is not established.

No Farms, No Monuments, No Trade Record

There is no evidence for agriculture, domestic animals, cultivated fields, houses, ceramics, metalworking, monuments or formal exchange networks in Ireland at this time. The economy documented by the landscape was ecological rather than agricultural: plants growing in cold wetlands, herbivores exploiting open ground, and predators or scavengers following animal resources. Any human economy, if present, would have depended upon mobility and knowledge of seasonal terrain. But neither trade nor travel routes can be recovered from the Irish evidence alone. Lower global sea levels and changing ice margins altered regional geography, yet the exact practical connections between Ireland, Britain and continental Europe at a given moment remain uncertain.

Religion and learning are equally beyond direct recovery. Upper Palaeolithic societies elsewhere made sophisticated tools, ornaments and images, but it would be unsound to assign any specific artistic or spiritual tradition to Ireland from a single disputed modification on bone. The absence of such evidence is

not evidence that people lacked culture; rather, it reflects the fragility of archaeological traces, later glaciation, and the small number of surviving and excavated deposits.

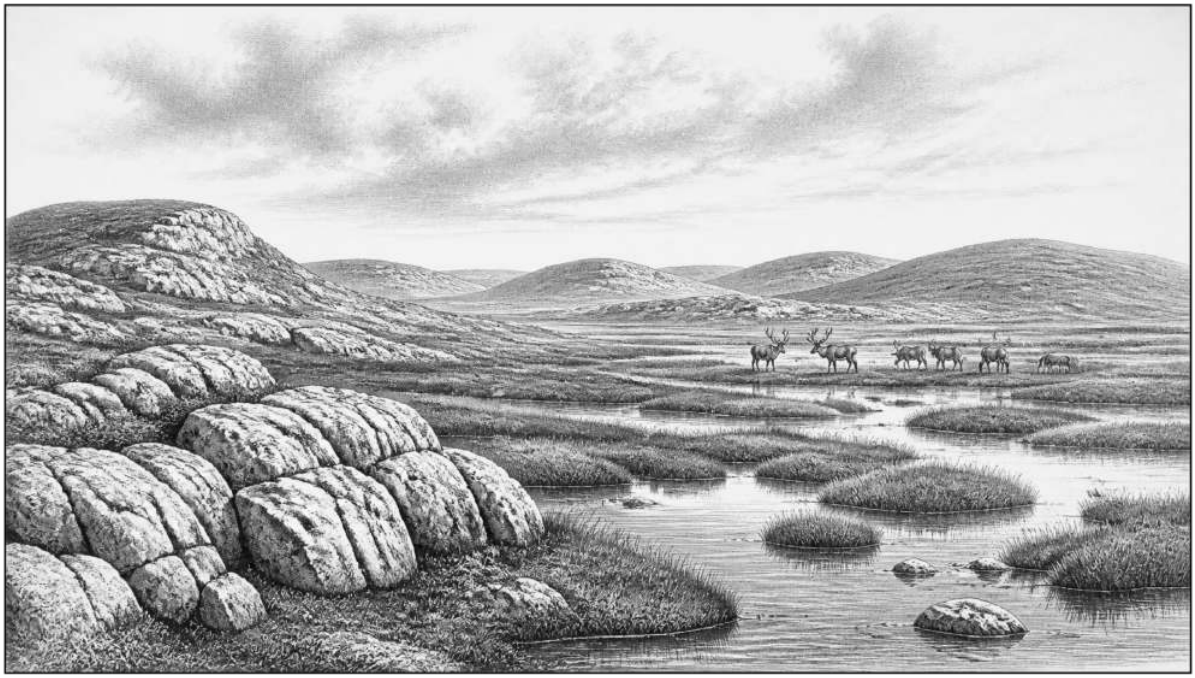
The Most Important Development

The principal development appropriate to 31,232 BCE is the existence of an Irish environmental archive revealing a cold but active landscape before the Last Glacial Maximum. Derryvree's freshwater bed demonstrates that, within a broad calibrated range embracing this modern year label, an ice-free Fermanagh basin held pools, sedges, mosses, insects and tundra plants between episodes of glaciation. Castlepook adds evidence of large mammals in southern Ireland and raises the provocative possibility of a fleeting human encounter with reindeer. Together they replace a blank Ice Age Ireland with a more complex picture: not a known human homeland, but a changing Atlantic frontier where life persisted and where people may, briefly and precariously, have entered the record.

Chapter 070 of 100

31231 BCE

The Awbeg Bone Mark [70]



31,231 BCE is a modern label for a point roughly 33,180 years before AD 1950, the conventional baseline for radiocarbon dating. It was not a year that anyone in Ireland recorded, named or experienced as a calendar date. There was no Irish kingdom, population register, chronicle or identifiable event to place within it. Modern calendar-year precision is therefore unavailable. The responsible approach is to examine calibrated date ranges and environmental sequences that illuminate the broad interval around this point: the later Middle Midlandian, within the Late Pleistocene and broadly Marine Isotope Stage 3.

A Country in a Changing Ice Age

Ireland around this broad horizon was not yet the ice-covered landscape associated with the Last Glacial Maximum, when the British–Irish Ice Sheet later reached its greatest extent. Nor was it a familiar green island. The climate was cold, highly variable and capable of changing sharply over periods far shorter than most geological records can resolve. Ice-sheet growth was becoming an increasingly important fact of life, but the timing and extent of ice differed from one region to another. Reconstructions of the last British–Irish Ice Sheet show why it is unsafe to draw a single coastline or ice margin for one nominal year. They work at scales of centuries and millennia, not 31,231 BCE itself.

The best broad conclusion is that substantial areas of Ireland retained ice-free terrain during parts of this period, while colder conditions, permafrost processes and expanding ice increasingly constrained habitats and routes of movement. This was a treeless northern environment, not an empty white wasteland. Its character varied between exposed uplands, stony ground, wet hollows, streams, lakes and caves. The appearance and disappearance of local vegetation and animals depended on short-lived climatic improvements as well as colder reversals.

Fermanagh’s Buried Wetlands

The clearest Irish evidence close in time comes not from a settlement, but from sediments preserved beneath later glacial deposits. At Derryvree near Maguiresbridge in County Fermanagh, organic-rich freshwater silts lie between two tills, deposits left by separate episodes of glaciation. The material yielded a radiocarbon determination of 30,500 ± 1,200 radiocarbon years BP. Calibration gives a broad range of approximately 36,900–31,700 calendar years BP. That range overlaps the era represented by 31,231 BCE, but cannot date conditions to that numbered year. It does, however, demonstrate that north-central Ireland had been ice-free long enough for a wetland ecosystem to develop before subsequent ice sealed the deposit below till.

Plant and insect evidence from Derryvree and comparable Fermanagh sites points to open, treeless ground with mosses, sedges, grasses, herbs and low shrubs. Such evidence has been interpreted as a cold muskeg or tundra-wetland mosaic, rather than forest or settled farmland. At Greenagho near Belcoo, another organic deposit beneath till produced a radiocarbon age of 32,500 ± 300 BP. These sites should not be treated as a complete map of Ireland: they are local archives, surviving in exceptional circumstances. Together, though, they overturn any assumption that the island was uniformly buried under ice at all times before the glacial maximum.

Water mattered greatly in this landscape. Shallow pools and marshy margins could support aquatic and wetland plants even where exposed ground was sparsely vegetated. Frozen or seasonally thawed soils affected drainage, while frost shattered rock and limited tree growth. The evidence records habitats and ecological processes, rather than a pleasant or stable climate. A productive summer wetland could coexist with severe winters and a short growing season.

Reindeer, Predators and Open Ground

Ireland’s cave and fossil collections show that a more varied cold-stage fauna occurred on the island between at least about 45,000 and 20,000 years ago. Reindeer are especially relevant to the present horizon, alongside species recorded in Irish Pleistocene assemblages such as brown bear, Arctic fox, hare, lemming, wolf, spotted hyaena, giant deer and woolly mammoth. The records do not prove that every species shared one place at one moment. Cave deposits often accumulated over long periods, and bones could have been moved by carnivores, water or earlier excavation. Yet the assemblages show that open-country herbivores and large predators could reach Ireland during suitable phases of the Ice Age.

Reindeer were well adapted to mobile life in open, cold environments. Their presence makes a landscape of grazing, browsing and seasonal movement plausible, but it does not allow us to reconstruct a particular herd route through Ireland in 31,231 BCE. Nor should modern national associations with the giant deer mislead: animal distributions then reflected shifting climate, available forage and geographical access, not later Irish identities.

The Castlepook Question

County Cork provides the most arresting, and most contested, possible human clue. Castlepook Cave near Doneraile, also known as Mammoth Cave, produced a fragment of reindeer femur during early twentieth-century excavation. The bone has been presented by Ruth Carden and by County Cork’s heritage publication as a Palaeolithic object of about 31,000 BC. It bears a deep surface mark interpreted

as having been made by a sharp stone tool while a fresh carcass was processed. If that diagnosis is sustained, it would be evidence that a person handled and butchered a reindeer in Ireland during the Upper Palaeolithic, far earlier than the island’s long-established post-glacial archaeological record.

Its importance must be matched by caution. The radiocarbon age concerns the animal bone, not an exact moment of cutting; radiocarbon years, calibrated calendar years and a rounded BC label are different measures. A single marked bone is not a camp. Castlepook has not yielded a securely associated hearth, built shelter, stone-tool assemblage, human burial or occupation surface of the same age. The cave’s deposits were investigated under methods very different from modern excavation, and animal remains may have entered its passages through natural processes or been carried in by scavengers. The heritage account itself considers it unlikely that butchery occurred inside the cave; a carnivore could have moved discarded remains there later.

Later work has strengthened the case for treating Castlepook’s old collections seriously, rather than as exhausted antiquarian curiosities. Improved ultrafiltration has shown that some earlier Irish Pleistocene bone dates were substantially too young, and modern projects have sought surviving deposits, accurate cave mapping, fresh palaeoenvironmental samples and microscopic evidence. That is a lesson in archaeological method: a promising interpretation is neither established by publicity nor dismissed because the evidence is sparse. It must be tested against context, dating and alternative explanations.

People Without a Political History

There is no evidence for political institutions, named leaders, diplomacy, territorial states, formal religion, monuments, agriculture, trade networks or permanent villages in Ireland at this date. Claims about them would be invention. If people did visit Ireland around this horizon, the most defensible model is of very small, mobile hunter-gatherer groups moving through a demanding northern landscape, probably pursuing opportunities created by animals, seasons and temporary environmental windows. Their social relationships, language, beliefs, clothing, boats and technologies cannot be recovered from the Castlepook bone.

Even a genuine butchery mark would nevertheless have cultural implications. It would indicate practical knowledge: the ability to use a sharp implement, process animal tissue and exploit the calories, hides, sinew and bone supplied by a large herbivore. It would also place Ireland, however intermittently, within the far north-western margin of Upper Palaeolithic movement across Europe. That is an interpretation based on one possible human trace and wider European comparison, not proof of a resident community.

Access to Ireland remains an important unanswered problem. Lower sea levels changed the surrounding geography, while ice, water, exposed shelf and shifting coastlines created different barriers and corridors at different times. There is no secure evidence that an easy, continuous land route carried people into Ireland at this precise horizon. Any journey, whether over exposed ground, ice margins or water, would have depended on conditions that cannot presently be reconstructed year by year.

What This Date Can Mean

The most important development around 31,231 BCE was environmental: Ireland lay in an unstable Ice Age interval before the main expansion of the last island-wide ice sheet. Buried Fermanagh wetlands preserve evidence for cold, ice-free landscapes; Cork cave bones demonstrate that reindeer and other

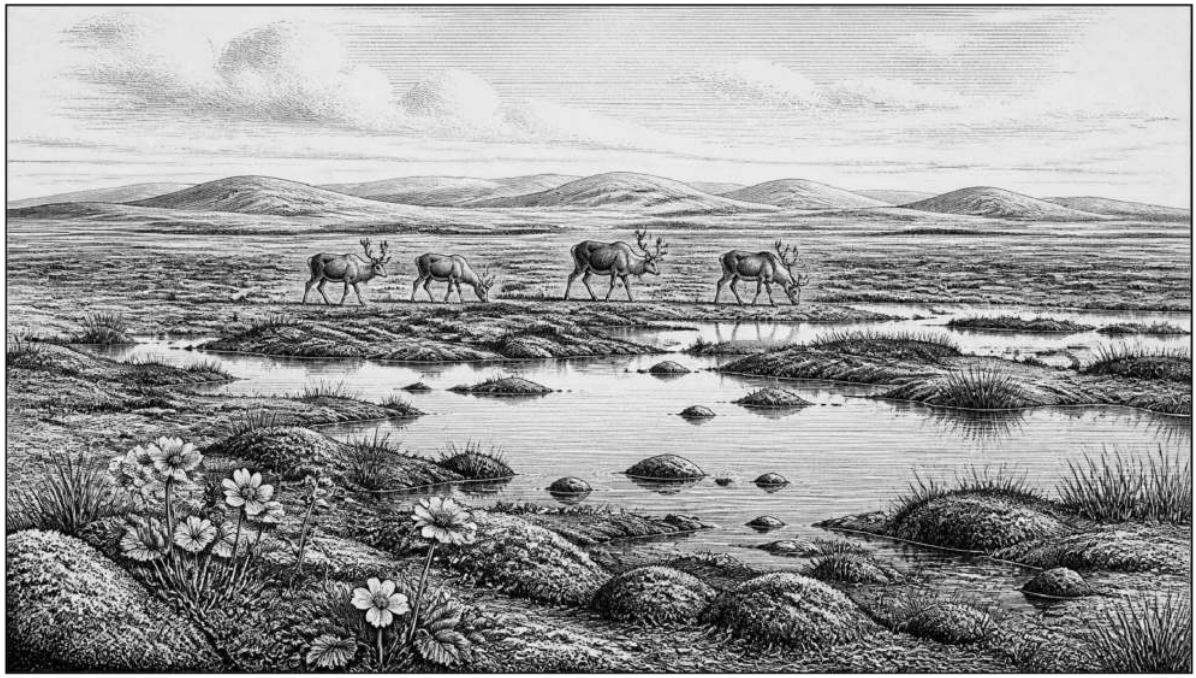
animals reached the island; and one incised reindeer femur raises the consequential possibility of human butchery. None supplies a political history, but together they reveal an Ireland that was ecologically active, geographically connected in changing ways and vulnerable to the advancing power of ice.

For this year-by-year series, then, the honest historical picture is necessarily broad. We cannot identify what happened in 31,231 BCE. We can say that the evidence closest to it records tundra wetlands, mobile animals, severe climatic uncertainty and a possible fleeting human presence. The silence is not evidence of nothingness. It is the condition of deep prehistory, where sediments, bones and the marks upon them carry more weight than any imagined event.

Chapter 071 of 100

31230 BCE

Maguirebridge’s Mountain-Avens [71]



Modern calendar-year precision is not available for Ireland in 31,230 BCE. The date is a retrospective label, roughly 33,180 calendar years before AD 1950, rather than a year that any contemporary person could have named or recorded. There are no annals, settlements, monuments or securely dated human occupations from which to construct an annual narrative. The responsible subject is instead a broad interval in the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), when Ireland’s climate, ice cover and animal populations changed repeatedly. Sediments, fossils, cave deposits and landforms can illuminate that world, but they reveal ranges and processes rather than a particular season, generation or event.

A Date Within a Wide Range

The closest chronological anchor is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed fine sands, freshwater silts and organic material enclosed between two substantial layers of till: the unsorted debris deposited by glacier ice. This sequence is valuable because its relative order is clear. Ice laid down the lower till; a period without local glacier cover allowed wetland and freshwater sediments to accumulate; then a later advance sealed them beneath the upper till.

An organic sample from the deposit, BIRM-166, produced a conventional radiocarbon age of 30,500 years BP, with a large uncertainty. Radiocarbon years are not calendar years: past atmospheric carbon-14 levels varied, so results must be calibrated against independently dated records. Modern calibration places the Derryvree material broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The nominal date of 31,230 BCE falls inside that extensive range. It cannot, however, be pinpointed to a particular sediment layer, nor does it identify the beginning or end of the wetland’s existence.

This is not merely a technical reservation. The uncertainty is the history. At this depth in time, an honest account must retain the distinction between what the deposits demonstrate and what archaeologists infer from them. Derryvree proves that an ice-free or at least locally ice-free freshwater environment existed at Maguiresbridge during part of late MIS 3. It does not prove that every part of Ireland shared the same conditions simultaneously, or that this particular modern calendar year saw a particular climatic turn.

Wet Ground Between Ice Advances

The plant and insect evidence from Derryvree gives the interval its distinctive character. The former drumlin hollow was not a familiar wooded Irish landscape. It was an open, treeless, cold wetland: a mosaic of shallow pools, sedge-rich ground, mosses and herbaceous tundra vegetation. Plant macrofossils include species associated with cold, wet and often calcareous ground, among them bogbean, mountain-avens and lesser clubmoss. Insect remains support the interpretation of a muskeg-like setting, with standing water, abundant plant matter and mossy margins.

Such evidence supports a picture of short summers, severe winters and a landscape in which frozen ground and seasonal thaw influenced drainage. It should not be converted into a precise weather report. The fossil assemblage records the accumulated life of a wetland over time, while individual species could occupy sheltered microhabitats. Nonetheless, it decisively counters an image of Ireland as either wholly buried under ice or reduced to bare rock. In at least this part of Fermanagh, freshwater, soils and specialised cold-climate vegetation sustained a functioning ecosystem.

Other Irish sequences reinforce the wider conclusion that MIS 3 was climatically uneven. Organic deposits beneath later glacial sediments at Greenagho and Hollymount in Fermanagh, and at Aghnadarragh in County Antrim, preserve fragments of earlier cold-stage environments. At Crag Cave in County Kerry, uranium-thorium dates show that calcite sometimes grew during MIS 3. Because speleothems require liquid water moving through cave systems, their episodic growth indicates intervals of relative amelioration. It does not mean that south-west Ireland was warm in a modern sense, nor that Crag Cave and Derryvree experienced identical conditions at the same moment.

A Changing Island Geography

By this stage the last British–Irish Ice Sheet was growing towards its later, much more extensive configuration. The main maximum lay ahead, but the expansion of ice was neither simple nor uniform. Ice margins moved in response to climate, topography and the surrounding seas; different sectors advanced and retreated on different timescales. The tills enclosing the Derryvree wetland are direct local evidence of more than one episode of glaciation, while Ireland’s drumlins, moraines, striations and offshore landforms preserve the much larger imprint of moving ice.

Lower global sea levels altered the geography around Ireland, exposing areas of continental shelf now drowned. Yet it would be misleading to draw a permanent, uncomplicated land bridge between Ireland and Britain for 31,230 BCE. Coasts, river valleys, ice margins and exposed ground all shifted through time. The arrival of large mammals demonstrates that routes existed during parts of the wider Late Pleistocene, but it does not identify a route open in this particular year. Later ice, erosion and rising seas have removed or submerged much of the evidence that might have clarified those connections.

The Cork Cave Fauna

County Cork offers a different kind of archive. Castlepook Cave, near Doneraile, yielded a remarkable collection during early twentieth-century excavations and later investigations: remains attributed to woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, Arctic fox, wolf, hare and lemmings. Revised radiocarbon work has shown that several southern Irish cave bones are substantially older than earlier measurements suggested, strengthening the evidence for a diverse MIS 3 fauna on the island. Reindeer and hyaena, in particular, fit an open, cold landscape with substantial grazing resources and active predators or scavengers.

The cave collection must nevertheless be handled carefully. Much of it was excavated before modern recording standards, and cave deposits can mix material moved by animals, water, collapse and earlier digging. A list of species from Castlepook is not a census of one moment, still less proof that every species encountered one another beside the cave on the same day. The secure conclusion is broader but important: Ireland supported, at intervals during MIS 3, large mammals and carnivores more commonly associated with the Pleistocene environments of north-west Europe.

A reindeer femur from Castlepook has attracted special attention because a deep mark has been interpreted as a cut made by a stone tool, and the bone has been publicly reported as dating to about 33,000 years ago. If that interpretation is confirmed, it may indicate the butchery of a reindeer by people in Ireland far earlier than the previously accepted terminal Palaeolithic evidence. But one marked bone from an old, incompletely stratified collection is not a settlement. No associated hearth, stone-tool assemblage, dwelling, human burial or occupation surface has yet established a resident community in Ireland around 31,230 BCE. The cut-mark claim is therefore an important possibility, not a licence to invent an Ice Age population.

Society Without a Recoverable Society

Nothing presently supports discussion of Irish rulers, political institutions, diplomacy, territorial boundaries, organised warfare, religion or formal learning at this date. There are no known communities from which social ranks, kin groups, languages, ritual practices or artistic traditions can responsibly be reconstructed. Similarly, there is no evidence for farming, craft production, exchange networks or trade conducted from Ireland. Terms such as economy and settlement must be used with exceptional restraint.

If people did reach the island during this period, the most that can cautiously be inferred from the possible Castlepook modification is a small-scale foraging activity: the use of a sharp edge to process animal tissue or bone. Comparable Upper Palaeolithic communities elsewhere in north-west Europe were mobile hunter-gatherers whose survival depended on knowledge of animal movements, raw materials and seasonally changing terrain. That comparison provides context, not proof that the same social arrangements existed in Ireland. Ireland’s own record is too slight to tell whether visitors were transient, recurrent or absent for long intervals.

The Principal Development

The central development around this notional date was environmental, not political. In Fermanagh, a cold freshwater wetland accumulated organic sediment between episodes of glaciation. Across the island, ice, exposed land, water and vegetation formed an unstable regional patchwork. In Cork, cave remains

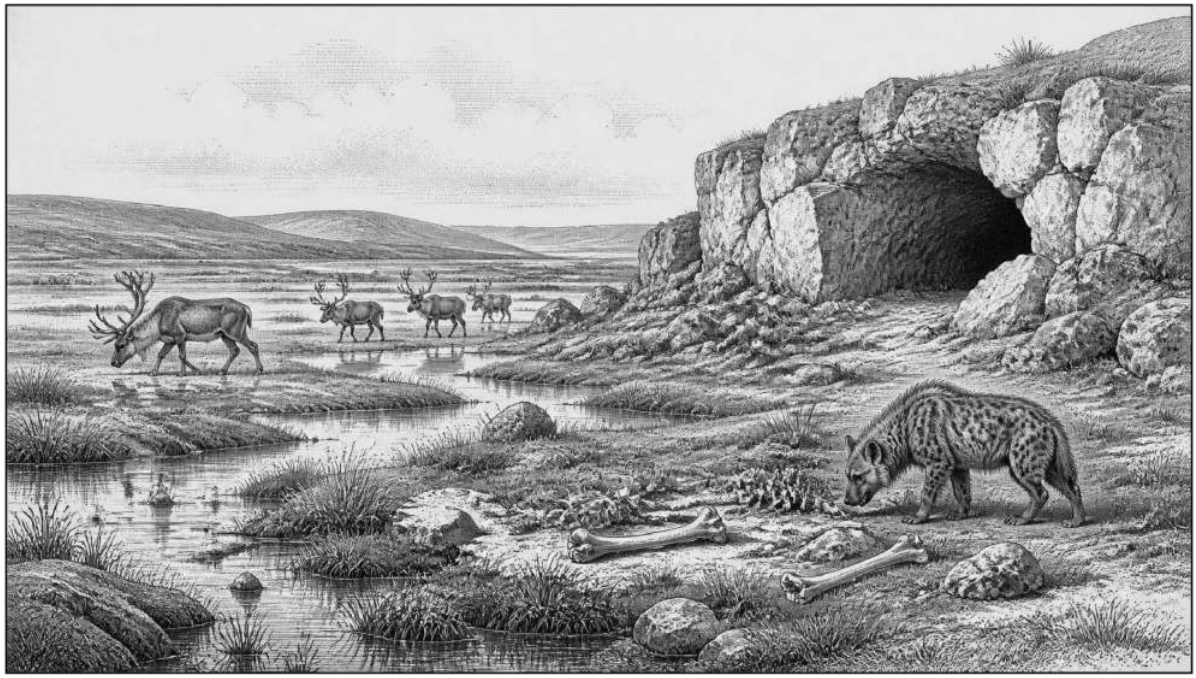
attest to the capacity of that wider landscape to sustain Pleistocene mammals, including reindeer and mammoth, as well as formidable carnivores. The evidence preserves a living Irish environment before the last glacial maximum transformed it again.

Maguirebridge’s mountain-avens and bogbean are therefore more historically secure guides to 31,230 BCE than any imagined chieftain, camp or battle. Their buried remains show that even in a harsh phase of the Ice Age, Ireland contained local habitats with water, plants, insects and animal life. They also remind us how precarious the archive is: later ice protected some sediments while destroying or dispersing countless others. What survives is enough to establish an inhabited landscape in the ecological sense, but not yet enough to write a human history year by year.

Chapter 072 of 100

31229 BCE

Castlepook’s Hyena Den [72]



“31,229 BCE” is a modern chronological label, not a year that can be recovered from Ireland’s prehistoric record. No known Irish community used a calendar that can be connected to this number, and neither archaeology nor palaeoclimate science can assign an event, a person or even a season to it. The label corresponds to roughly 33,178 years before AD 1950. It falls within the Late Pleistocene, during Marine Isotope Stage 3 (MIS 3), a cold and climatically unstable part of the last Ice Age. The responsible history of Ireland at this point is therefore a history of landscapes, animal remains, sediments and uncertainty rather than an annual chronicle.

Modern calendar-year precision is unavailable. Radiocarbon results must be calibrated, and a date from this depth of time generally produces a range extending over centuries or millennia. The closest Irish environmental archive is not a document from 31,229 BCE but an organic deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its age range is broad enough to illuminate the general period, rather than a particular year. The other major body of relevant evidence comes from cave deposits in southern Ireland, especially Castlepook Cave near Doneraile, County Cork, where bones of cold-adapted mammals record a changing Ice Age fauna.

A Landscape Between Ice Advances

Ireland was not yet simply the familiar green island of later history, nor can it responsibly be pictured as uniformly buried beneath ice. The British–Irish Ice Sheet was growing and changing. Large reconstructions of its history suggest that, by about 31,000 years ago, substantial ice masses occupied parts of northern Ireland, including an ice cap spanning uplands from the Derryveagh Mountains towards the Sperrins, while smaller ice fields or glaciers existed in other high areas. Yet ice extent, thickness and

timing varied between regions, and every reconstruction contains margins of uncertainty. The greatest late-glacial ice expansion across Ireland and its surrounding shelves lay later, broadly during the interval after about 27,000 calibrated years ago.

This distinction matters for the date in question. Around 31,229 BCE, Ireland stood within a transition towards more extensive glaciation, not at a single immutable “Ice Age” condition. Low sea levels had altered coastlines and exposed parts of the continental shelf, but the existence, route and duration of a passable land connection between Ireland and Britain remain difficult questions. Glaciers, marine waters, changing shorelines and seasonal sea ice could each have impeded movement. Animal remains demonstrate that mammals reached Ireland during parts of MIS 3; they do not, by themselves, establish a simple, permanent migration corridor.

Derryvree’s Buried Wetland

The Derryvree site is especially valuable because roadworks in 1969 exposed a sequence inside a drumlin: glacial till below, freshwater silts and fine sands in the middle, and another glacial deposit above. Till is sediment laid down directly by ice. The sequence therefore provides direct geological evidence for an interval in which water, sediment and living organisms occupied ground that was later overridden and sealed by renewed ice. An organic sample, BIRM-166, produced a radiocarbon result of 30,500 years BP, with a large uncertainty. Calibration has placed the deposit broadly around 36,900–31,700 calibrated years BP.

That range includes the notional date of 31,229 BCE, but it cannot tell us that a particular pool, plant or animal was present in that numbered year. The evidence is nonetheless powerful. Plant macrofossils, pollen, mosses and insects from the deposit indicate a cold, open and largely treeless environment. The original investigators described a periglacial tundra or muskeg setting: wet hollows and freshwater pools amid frost-affected ground, short growing seasons and sparse vegetation. Such evidence is observation. The fuller reconstruction of wind exposure, seasonal severity and the wider regional mosaic is interpretation, albeit interpretation grounded in the ecological requirements of the recovered species and the sediments in which they survived.

For people accustomed to wooded Ireland, the contrast is striking. There is no basis for imagining oak woodland, enclosed fields, bogland formed by agricultural clearance or a settled rural landscape. The Derryvree plants instead point to a northern environment in which sedges, mosses, dwarf shrubs and cold-tolerant herbs could occupy suitable niches. Freshwater life endured in sheltered places, even as frost, snow cover and glacial expansion shaped the larger landscape. This was a world of local variation: a wet basin could preserve biological material that has disappeared from wind-scoured slopes or terrain later ground up by ice.

Castlepook and the Cold-Stage Fauna

More than 300 kilometres south-west of Derryvree, Castlepook Cave offers a different kind of archive. Excavations begun in the early twentieth century recovered a remarkable collection of animal remains, now chiefly associated with the National Museum of Ireland. The cave is Ireland’s richest known Pleistocene vertebrate site. Its fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, hare, lemmings and spotted hyaena. Not every specimen is necessarily contemporary, and the original excavations did not meet modern recording standards. Water, carnivores, later disturbance and the removal of sediments during antiquarian work all complicate the evidence.

Even with those cautions, improved radiocarbon dating has transformed the significance of the southern cave fauna. Research published in 2020 found that some Castlepook remains were substantially older than earlier measurements had suggested, placing important elements of the assemblage firmly within MIS 3. The results imply that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, perhaps around 40,000 calibrated years BP. Castlepook is consequently best understood as evidence for a changing series of Ice Age animal communities, not as a perfectly sealed snapshot of one moment.

The spotted hyaena is particularly evocative. Tooth-marked bones and the character of the assemblage support the interpretation that carnivores helped accumulate bones in the cave. A hyaena den was not a human settlement and should not be treated as one. It nevertheless reveals an ecological relationship otherwise alien to later Irish history: large scavenging and hunting carnivores moved through a country also used by mammoth, reindeer and giant deer. The evidence does not establish the size of herds, regular migration routes or population densities. It does establish that Ireland was repeatedly accessible to a suite of large mammals during this part of the Ice Age.

The Human Question

The possibility of people in Ireland around this broad period remains important but unresolved. A reindeer femur from Castlepook has been publicised as dating to approximately 33,000 years ago and as carrying a deep mark interpreted by zoologist Ruth Carden as damage made by a stone tool during butchery. If that interpretation is sustained through detailed taphonomic study, it would be an exceptionally early trace of human activity in Ireland: evidence that one or more Upper Palaeolithic people handled a carcass before the most extensive phase of the last glaciation.

It cannot yet carry the weight of a conventional national origin story. One modified bone would not demonstrate a permanent population, a camp, a language, kinship group, technology tradition, trade network or route of arrival. A date for the bone is not automatically a date for the mark, and a cave collection excavated long ago demands special care. No securely identified stone-tool assemblage, hearth, dwelling, burial, artwork or repeated occupation surface of this age has been recovered in Ireland. The first published, directly dated evidence of human butchery accepted in peer-reviewed scholarship remains much later: a brown-bear bone from Alice and Gwendoline Cave, County Clare, dated to the terminal Pleistocene, about 12,810–12,590 calibrated years BP.

Society Beyond the Evidence

Accordingly, political affairs, diplomacy, warfare and formal religion cannot be described for Ireland in 31,229 BCE. There were no recorded polities, rulers, place-names, treaties or monuments. Nor does the material record support confident claims about families, social rank, ritual or learning. It would be misleading to import the well-known art, ornaments and hunting practices of Upper Palaeolithic communities elsewhere in Europe and present them as Irish facts. Such comparisons can identify what was possible in the wider human world, but they are not evidence that the same practices occurred on this island.

The same restraint applies to economy and trade. There is no evidence for farming, livestock, metalworking, exchange networks or settlement in Ireland at this horizon. The animal record does show resources that could have mattered to any visitors: meat, fat, marrow, hides, sinew, antler and bone from

large mammals. But Castlepook cannot demonstrate that people hunted a particular mammoth or reindeer, what they took from it, or whether they stayed longer than a brief episode. Nature, not a documented human economy, is the primary subject.

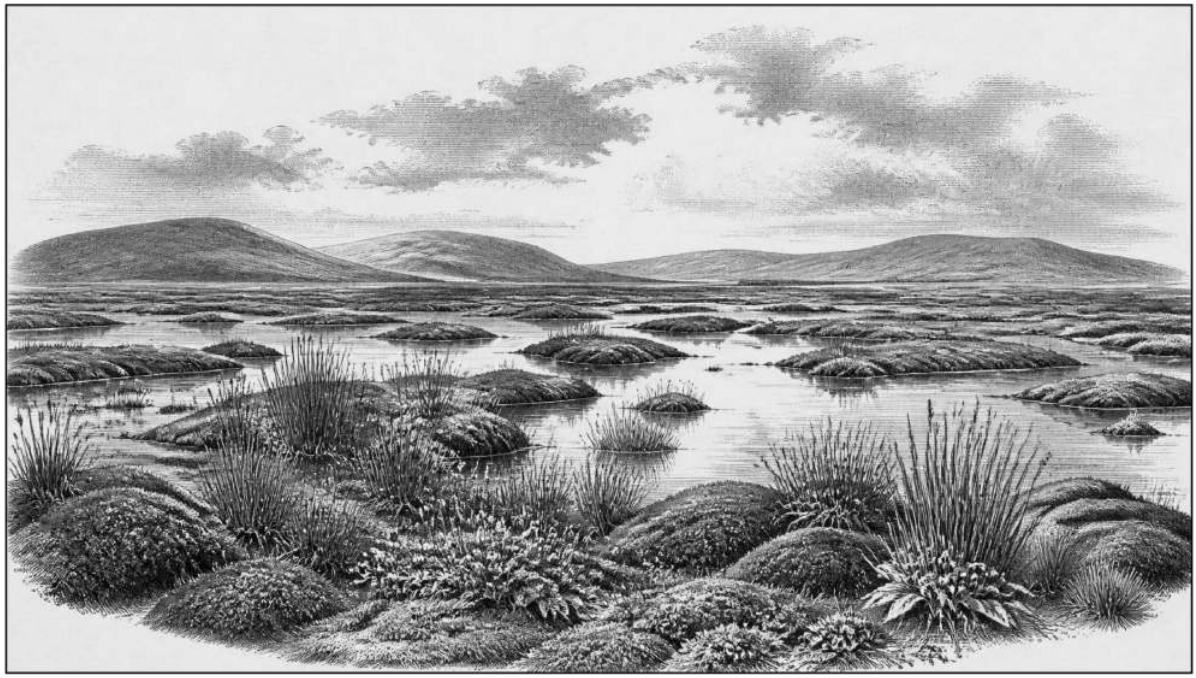
An Uneven Irish Past

The most important development around this notional date was environmental rather than political: Ireland was entering a phase in which growing ice sheets, severe climates and altered coastlines would repeatedly reduce, reshape and erase habitats. Later glaciation destroyed or buried much of the evidence that might once have recorded human visits. This helps explain why Ireland’s deep past is so fragmentary, but absence of evidence must not be turned into proof that nobody ever came. The cautious conclusion is narrower and stronger. Around 31,229 BCE, Ireland contained cold, open and regionally varied Ice Age environments; large mammals had reached it; glaciers were expanding; and a proposed humanly modified reindeer bone raises the possibility of a fleeting human presence. Beyond that, the record falls silent.

Chapter 073 of 100

31228 BCE

Derryvree’s Arctic Clubmoss [73]



The label 31,228 BCE is a modern way of counting backwards, not a date that can be matched to a recorded Irish event. No written record, named person, settlement, political community or calendar exists for Ireland at this depth of time. In archaeological terms, it falls broadly around 33,200 calibrated years before present, with “present” conventionally fixed at AD 1950. That apparent precision is misleading: the evidence is dated in ranges, often with substantial uncertainty, and describes episodes lasting centuries or millennia. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, a climatically unsettled interval of the last Ice Age before the greatest expansion of the British–Irish Ice Sheet.

The closest Irish evidence is not a chronicle but a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed sands, silts and organic sediments sealed between two layers of glacial till within a drumlin. The organic horizon produced a conventional radiocarbon age of 30,500 ± 1,100 radiocarbon years BP. Calibration makes clear why an exact BCE year cannot be claimed: the deposit belongs broadly to a span around the mid-30,000s to low-30,000s calibrated years BP, rather than to a single moment. Nevertheless, it is an unusually valuable window on an Irish landscape close to the requested date.

A Wetland Between Ice Advances

Derryvree demonstrates that northern Ireland was not simply a permanent white void throughout the last glacial cycle. At the time represented by its freshwater beds, standing or slowly moving water occupied a hollow in an open, cold landscape. Pollen, plant macrofossils, mosses and insect remains

accumulated in mud before a later ice advance buried the site. These remains are direct evidence for a functioning wetland ecosystem; the wider reconstruction of its appearance and climate is interpretation, albeit interpretation grounded in several independent kinds of evidence.

The vegetation was predominantly treeless. Grasses, sedges, herbs and dwarf-shrub or tundra elements dominate the environmental signal, while mosses and aquatic or wet-ground plants indicate saturated margins, shallow pools and peaty ground. A fossil seed of bogbean, *Menyanthes trifoliata*, is especially evocative: it indicates freshwater or fen-like conditions, not a dry polar desert. Other finds include water-milfoil and aquatic mosses. Pollen from juniper occurs, but this need not mean a nearby juniper woodland; pollen can travel, and the total assemblage points to exposed, largely treeless terrain.

“Muskeg” is a useful, though imperfect, term for this mosaic: waterlogged ground rich in mosses and sedges, broken by pools and probably subject to freezing, thawing and seasonal shifts in water level. The insect assemblage supports the existence of plant-rich wet ground in a severe climate. Summers may at times have allowed plant growth and liquid water, but winters were harsh. This was no agricultural landscape. There is no evidence of fields, grazing livestock, hedges, planted woodland or domesticated crops; farming in Ireland lay tens of millennia in the future.

Ice, Water and an Unstable Island

Ireland’s place within the British–Irish Ice Sheet system was changing. The great ice expansion generally associated with the Last Glacial Maximum came later, reaching its maximum extent roughly between 26,000 and 20,000 years ago, depending on region and measure. Around the Derryvree interval, however, ice growth, local glacier activity, sea level and the availability of ice-free ground were already matters of profound environmental consequence. Reconstructions of the wider ice sheet beginning at 31,000 years ago are necessarily model-based in many areas, because direct chronological constraints are uneven. They should not be read as a map of conditions in one numbered year.

The later ice sheet profoundly affected what can now be known. Glaciers eroded bedrock, reworked older sediment, buried surfaces beneath till and altered river systems. Rising seas after the Ice Age drowned large parts of the former coastal plain and shelf. A campsite beside a river, a trackway across soft ground or a short-lived animal kill site would have had poor odds of surviving these processes. The scarcity of evidence is therefore meaningful, but it is not a simple census of all who or what may once have been present.

At Derryvree, the sequence itself tells this story of change. Freshwater sediment was laid down during an interval in which the locality was not overridden by ice; later glacial sediment sealed it. That relationship gives the deposit exceptional importance. It records an ecological interlude between glacial episodes, not an enduring environmental norm for the whole island. Conditions in limestone caves in Cork, coastal lowlands, uplands and the Irish Sea basin may have differed significantly at the same broad time.

Animals Without a Yearly Fauna List

Irish cave deposits reveal that large mammals entered Ireland during parts of the Middle and Late Pleistocene. Castlepook Cave, near Doneraile in County Cork, has yielded remains of spotted hyena, woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare and lemmings. These

finds establish that Ireland was, during favourable phases of the wider period, part of a north-west European world in which cold-adapted and open-country mammals could move and survive. They also show that the island's Pleistocene fauna was richer than its modern fauna might suggest.

Yet this is precisely where caution matters. Cave deposits are often mixed, disturbed or accumulated over long intervals. Recent reassessment of Marine Isotope Stage 3 fauna from southern Ireland has revised the implications of older radiocarbon determinations, indicating that some Castlepook mammals may be considerably older than once thought and may have disappeared locally well before the Last Glacial Maximum. The Castlepook record must therefore not be turned into a claim that mammoths or hyenas stood at Derryvree in 31,228 BCE. It is evidence for a changing regional fauna across a long interval, not a wildlife inventory for a particular year.

Nor should "giant Irish deer" be imagined as an animal confined to Ireland. *Megaloceros giganteus* ranged widely across Eurasia, though Irish fossil discoveries made it famous. Its imposing antlers, like mammoth remains, belong to a deep-time fauna whose local presence depended on habitat, climate, migration routes and survival through successive cold phases. Predators and scavengers, notably spotted hyena, remind us that a reindeer or giant deer carcass could enter a cave through animal behaviour rather than human hunting. Bone accumulations require taphonomic investigation before they can be translated into stories of people.

The Human Question

There is no securely dated settlement, stone-tool assemblage, hearth, burial, house, artwork or human bone that demonstrates a resident human population in Ireland around this time. Consequently, there is no responsible basis for describing chiefs, tribes, alliances, warfare, diplomacy, religion, language, trade routes or learned traditions in 31,228 BCE. Such subjects belong to later archaeological and historical periods, not to the Derryvree wetland record.

Ireland was not necessarily beyond the reach of people. Upper Palaeolithic communities elsewhere in north-west Europe were capable hunters, foragers and travellers in severe climates, and Pleistocene animal movements show that Ireland was not permanently isolated from neighbouring landmasses. But capability elsewhere is not proof of occupation here. The earliest currently secure evidence of human activity in Ireland is much later: a cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to about 12,800–12,600 calibrated years BP. That find is important precisely because it is direct evidence, while no comparably secure human trace belongs to the Derryvree interval.

One may reasonably infer the challenges that any brief visitor would have faced: exposure to cold, variable weather, difficult ground, dangerous large animals and the need for fuel, shelter, hides, food and workable stone. A small mobile party might leave little behind. But this remains an inference from comparative Upper Palaeolithic archaeology, not a demonstrated account of Irish life. The distinction preserves the significance of the evidence rather than diminishing it.

Deep Time, Not Empty Time

To call this prehistoric Ireland "empty" would be too absolute. Derryvree preserves water, sedges, mosses, insects and cold-adapted plant communities; cave sites preserve traces of animals that crossed and lived in parts of the island during the broader Ice Age. These are not marginal details. They reveal

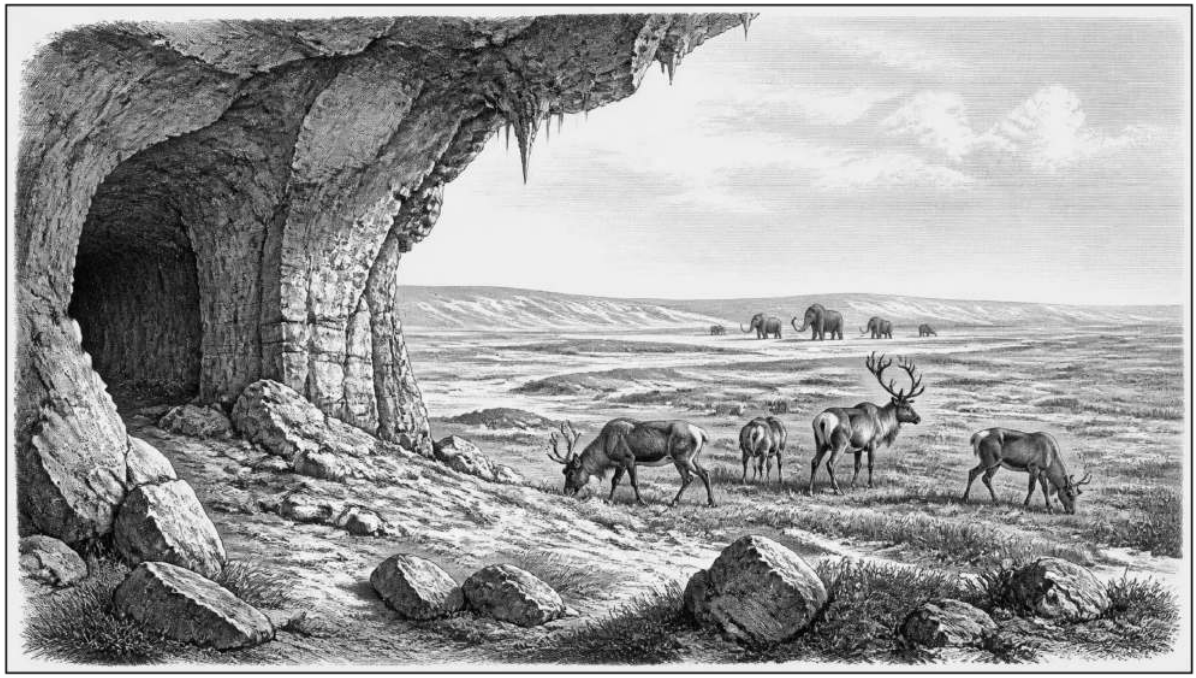
ecological connections, climatic volatility and the processes that shaped the physical Ireland inherited by later peoples. Drumlins, glacial sediments, altered drainage and drowned coastlines are part of that long inheritance.

But it would be equally wrong to make the evidence tell a story it cannot carry. Around the modern label 31,228 BCE, Ireland is known through calibrated ranges, stratigraphy, pollen, seeds, insects, bones and the later action of ice. Derryvree's buried wetland offers the clearest image: an exposed, treeless, cold landscape where mossy, sedgy ground and open water persisted for a time between advances of ice. It is a fragmentary record, but a remarkable one—proof that even in one of Ireland's least knowable ages, life left traces.

Chapter 074 of 100

31227 BCE

Mammoth Cave Before the Maximum [74]



31,227 BCE is a modern calendar label, not a date that can be recovered from the Irish archaeological record with year-by-year precision. Expressed approximately in the language used by Quaternary scientists, it falls around 33,200 years before present, though converting between BCE, radiocarbon years and calibrated calendar years is not exact. The responsible history of Ireland at this depth of time must therefore use ranges, stratigraphy and probabilities rather than claim that an identifiable event happened in this particular year. It belongs to Marine Isotope Stage 3, in the later Pleistocene, when climates in north-west Europe were highly unstable and the last British–Irish Ice Sheet was beginning its major growth towards its later maximum.

A Date Within a Long Transition

At about 33,000 calibrated years ago, Ireland stood before—not at—the fullest extent of the last glaciation. The term “Last Glacial Maximum” can be misleading if imagined as a single instant across every region. Ice sheets expanded and reached their greatest limits at different times. Current syntheses place substantial growth of the British–Irish Ice Sheet after roughly 35,000–32,000 years ago, while the Irish Sea sector expanded markedly from about 30,000 to 26,000 years ago; its furthest south-western advance came later, around 25,600 years ago. Thus 31,227 BCE belongs to an ice-building world whose outlines were changing over millennia, not to a settled, uniform age of ice.

This distinction matters for Ireland. Much of the familiar physical evidence of the last glaciation—drumlins, tills, striated rock, meltwater channels and many moraines—records later advances and retreats. It cannot automatically tell us whether a particular valley, cave entrance or coastal plain was ice-covered in a narrowly defined year more than 33 millennia ago. Geological Survey Ireland’s mapping

demonstrates the scale and variety of this glacial inheritance, but the landforms are the accumulated result of repeated movements of ice, sediment and meltwater. They are archives of process rather than annual chronicles.

An Unstable Cold Landscape

The best broad interpretation is that Ireland was increasingly cold, open and environmentally severe, but was not necessarily a single continuous white sheet from coast to coast at this date. The exact extent and thickness of ice remain subjects of active research, particularly in mountain areas and around the Irish Sea. Later evidence confirms that the Irish Sea Ice Stream became a powerful outlet of the wider ice sheet and eventually occupied much of what is now the Irish and Celtic seas; however, its maximum is generally dated to about 25,000–23,000 years ago, several thousand years after the date considered here.

Where land was exposed, it would not have resembled modern Ireland. During cold-stage intervals, tree cover was greatly reduced or absent and low vegetation supported grazing animals adapted to open conditions. The detailed Irish environmental record for precisely 33,200 years ago is fragmentary, so a neat reconstruction of particular plants, temperatures or coastlines would be overconfident. Yet the animal assemblages from Irish caves, combined with wider north-west European evidence, support an interpretation of tundra or mammoth-steppe-like mosaics: grass- and herb-rich open ground, patches of wetland, frost-affected soils and sheltering limestone caves. Such habitats could change markedly as climate oscillated and ice margins migrated.

Sea level was lower globally than today because vast volumes of water were stored in continental ice sheets. The modern Irish coastline and Irish Sea should therefore not be projected unchanged into this period. Still, whether Britain and Ireland were connected by dry land at every phase, and which routes were traversable, depends on local ice, relative sea level and changing topography. The prudent conclusion is not a confidently drawn land bridge, but a changing western fringe of Europe in which marine basins, exposed shelves, glaciers and terrestrial corridors repeatedly altered possibilities for animal and human movement.

Castlepook’s Older Fauna

The most important Irish evidence relevant to this broad horizon comes from Castlepook Cave near Doneraile, County Cork, historically also called Mammoth Cave. Excavations in the early twentieth century produced a large but imperfectly recorded collection of bones. Later re-examination and improved accelerator radiocarbon methods have shown that some southern Irish cave faunas are substantially older than earlier measurements suggested. Castlepook therefore preserves evidence for an Ice Age animal community in Ireland during Marine Isotope Stage 3, before the final major ice expansion.

The assemblage is especially significant because it includes animals whose presence evokes a very different Ireland: reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, hare, lemmings and spotted hyaena. Not every species need have lived side by side at the same moment; cave collections can combine material deposited over long periods, and early excavations often disturbed layers or recorded their positions inadequately. Nor does a bone in a cave necessarily indicate an animal died there. Carnivores may have carried prey inside, water and sediment may have moved remains, and human or animal activity may have reworked deposits. The evidence securely establishes a varied cold-stage fauna; the exact ecological snapshot remains an interpretation.

Reindeer are particularly relevant. Their bones occur in Irish Pleistocene contexts and their ecology is consistent with open, cold landscapes. Mammoth remains at Castlepook likewise attest to conditions capable of sustaining, at least episodically, large herbivores associated with Late Pleistocene northern Europe. Hyaenas imply predators and scavengers able to exploit carcasses and shelters. This was not an economy created by Irish farmers or herders—agriculture, domesticated stock, villages and fields lay tens of millennia in the future—but an ecological system shaped by seasonality, mobility, predation and climatic pressure.

The Human Question

Whether people entered Ireland at or near this time is the most consequential and most uncertain question. A reindeer femur from Castlepook has been publicly reported as dating to about 33,000 years ago and as bearing a deep mark interpreted as consistent with cutting or chopping by a stone tool. If that interpretation and its association with the dated bone are upheld through full specialist publication, it could represent very early Upper Palaeolithic human activity in Ireland: not a settlement, but a person or small party handling a reindeer carcass. It would push the evidence for human presence far earlier than the long-accepted record.

That is not, however, a licence to populate 31,227 BCE with named hunters, camps, routes or traditions. A single modified bone cannot demonstrate a permanent population, a dwelling, a tool kit, kinship group, language, political territory or sustained hunting economy. Its cave context is complicated, and the distinction between a human cut mark and damage caused by carnivores, excavation, sediment movement or other processes demands careful microscopic and contextual assessment. The National Museum of Ireland has traditionally stated that no clear evidence had established Palaeolithic human presence in Ireland; more recent work at Alice and Gwendoline Cave in County Clare has supplied evidence of human activity only much later, during the terminal Pleistocene, around 12,700 calibrated years before present.

The most balanced description is therefore that an early human visit to southern Ireland around this broad period is possible and potentially very important, but remains a matter requiring further publication and testing. If people did reach Castlepook, they were unlikely to have encountered an isolated island society. They would have been mobile Upper Palaeolithic foragers operating at the far north-western edge of European ecological networks, following opportunities created by animals, exposed ground and changing coasts. That wider comparison is reasonable; a claim for regular Irish occupation is not presently warranted.

No Polities, No Recorded Religion

For the usual categories of historical writing, the evidence is mainly silence. There were no documented Irish kingdoms, chiefs, treaties, battles, diplomatic missions, towns, markets, shrines or schools in 31,227 BCE. There is no basis for assigning political authority or organised conflict to Ireland at this date. Nor can cave bones reveal a religion, ritual calendar, spoken language, artistic canon or inherited ethnic identity. The absence of such evidence is not proof that a passing human group had no beliefs or social relationships; it means that archaeology cannot responsibly recover them here.

Likewise, “trade” should not be imagined as commerce between Irish communities. The relevant movements were ecological and geographical: animal dispersal, possible human foraging journeys, and the transport of bone and sediment into caves. The durable cultural traces normally used to discuss

learning and society—stone assemblages, hearths, structures, ornaments, burials and art—have not been securely demonstrated for Ireland at this early horizon. Ireland's first substantial and sustained archaeological record belongs much later, after deglaciation, with Mesolithic communities conventionally dated from about 8000 BCE.

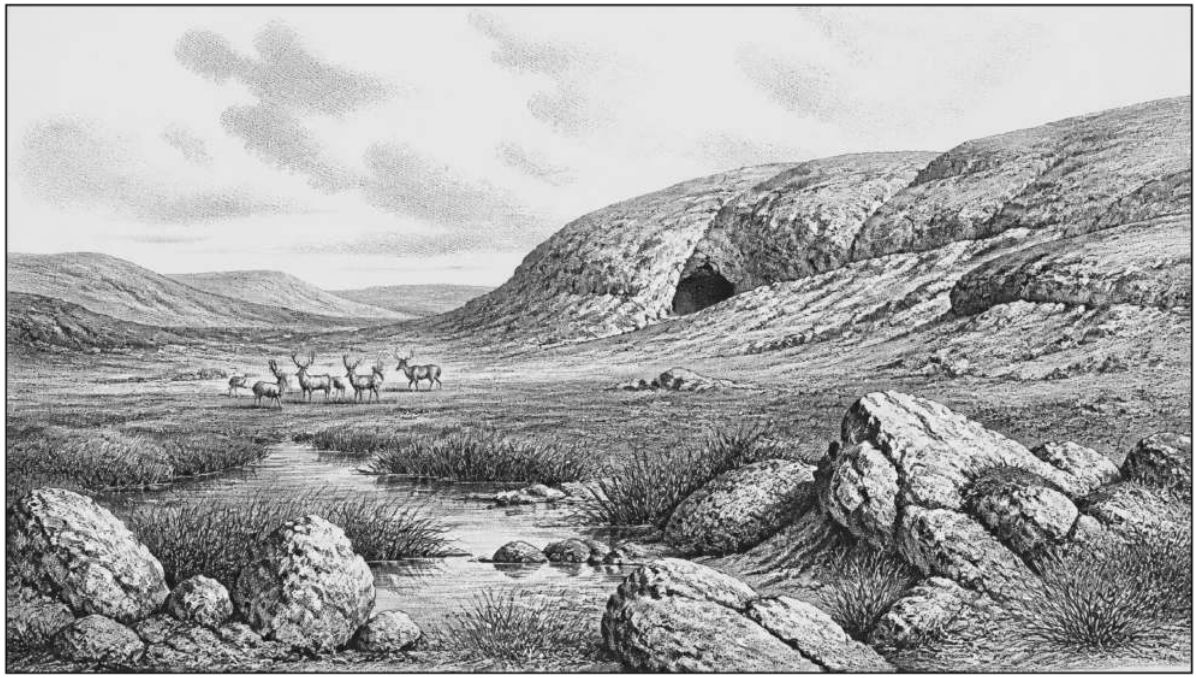
What This Year Can Mean

The significance of 31,227 BCE is therefore not a dated episode but a threshold. Ireland was entering the long build-up to the last great ice advance. Its caves preserve evidence that cold-adapted animals, including reindeer and mammoth, ranged through at least parts of the island in the broader period. Castlepook offers a tantalising possibility that people briefly shared that world, while also demonstrating why deep prehistory must distinguish a dated specimen from a securely dated human event. Future excavation of intact deposits, improved dating and microscopic study may clarify the picture. For now, the most defensible Irish history is one of a changing Ice Age landscape, a rich but discontinuous animal record, and a human presence that remains possible rather than proven for this exact calendar year.

Chapter 075 of 100

31226 BCE

Doneraile’s Reindeer Femur [75]



31,226 BCE is not a date to which Irish prehistory can be assigned with calendar-year precision. No community in Ireland used a calendar resembling the modern BCE system, and neither archaeology nor environmental science can identify a particular event, season or individual in this numbered year. Mechanically converted to the archaeological convention of years before AD 1950, it falls about 33,176 years before present. The responsible setting is therefore a broad one: the later part of Marine Isotope Stage 3 (MIS 3), during the Last Glacial period and before the fullest expansion of the Last Glacial Maximum ice sheet.

That broad placement matters because conditions changed rapidly on geological timescales. Radiocarbon determinations have statistical uncertainty and must be calibrated; cave deposits and ice-margin reconstructions commonly have resolutions of centuries or millennia, not individual years. The closest Irish evidence is a reindeer femur from Castlepook Cave, near Doneraile in north County Cork, publicly presented as dating to about 31,000 BCE and carrying a mark interpreted as the trace of a sharp stone tool. It makes this notional year unusually significant, but it cannot support a story of a dated hunt, an established village or a named first settler.

A Cave Find Near the Date

Castlepook Cave, also called Mammoth Cave, has long been recognised as one of Ireland’s most important Pleistocene faunal sites. Excavations undertaken in the early twentieth century recovered a large, varied bone assemblage. Later work on the National Museum of Ireland collections, including the Irish Quaternary Fauna Project and subsequent re-dating, demonstrated that the cave contained animal remains from very different phases of the last glacial cycle. This is both its value and its difficulty: Castlepook preserves evidence from deep time, but it is not a neatly sealed snapshot of one occupation.

The reindeer femur is central to the human question. Ruth Carden has interpreted a deep linear modification on it as a cut or chopping mark made with a sharp stone implement while the bone was fresh. County Cork heritage material dates the specimen broadly to c. 31,000 BCE. If that diagnosis is sustained, the bone indicates that a person or people processed a reindeer in Ireland in the Upper Palaeolithic, far earlier than the long-established evidence for the island's Mesolithic settlement.

Yet the limits of the claim are as important as its promise. The old excavations pre-date modern recording standards, and cave bones can be moved by carnivores, water, frost, collapse, digging and earlier excavation. A radiocarbon date measures the age of the bone's organic material: it does not independently date the incision, name its maker, establish where the animal was killed or show how long people stayed. No securely associated stone-tool assemblage, hearth, shelter floor, burial, human bone or repeated food-waste deposit of comparable age has been recovered in Ireland. The most cautious conclusion is possible human carcass processing, not proven permanent occupation.

An Island in a Changing Ice-Age World

At about 33,000 years ago, Ireland was not the fully ice-covered landscape often imagined from the peak of the last glaciation. The British–Irish Ice Sheet was developing unevenly, and the extent of ice varied considerably between regions and through time. Modern reconstructions can model growing ice over northern and upland parts of Ireland by about 31,000 years before present, but constraints become sparse further back. They do not license a precise national map for 31,226 BCE. Ireland may have contained glaciers, icefields, periglacial ground and ice-free lowlands at different times; its geography was dynamic rather than uniform.

Sea level was much lower than today because vast quantities of water were stored in continental ice. The Irish Sea basin and neighbouring shelves consequently had a different appearance, although lower sea level did not automatically create a simple, dry land bridge from Ireland to Britain or continental Europe. Any movement of animals or people depended on the changing arrangement of sea, ice, coasts, channels and weather. The presence of large mammals in Ireland proves that routes existed during favourable intervals; it does not reveal whether a human visitor came by a short crossing, along exposed coastal terrain or by a more complex sequence of movements.

Environmental archives offer local, carefully bounded evidence. At Derryvree near Maguiresbridge in County Fermanagh, organic sediments sealed between tills record an earlier ice-free interval with freshwater and wetland habitats. Plant macrofossils, pollen and insects point to a cold, treeless, muskeg-like environment in which sedges, grasses, herbs, dwarf shrubs and hardy aquatic plants could survive. The dated organic horizon cannot serve as a daily weather record for County Cork, nor can it be pinned confidently to this exact BCE year. It nevertheless demonstrates an essential point: the last glacial period included intervals when parts of Ireland held open, biologically productive landscapes between advances of ice.

Further south-west, uranium-thorium dates from Crag Cave in County Kerry show that calcite formed episodically during MIS 3. Since stalagmite growth requires liquid water to circulate through shallow cave systems, these deposits provide independent evidence for milder episodes without permanent frozen ground at that locality. They reinforce a picture of abrupt climatic fluctuations rather than one endless, unchanging winter. But a warm episode registered by a stalagmite is not a guarantee that all of Ireland was habitable, nor does it date human activity at Castlepook.

Reindeer, Carnivores and Open Country

The Castlepook fauna is the soundest guide to the living landscape around this remote horizon. Reindeer are strongly associated with cold, open environments and seasonal mobility. Other Castlepook finds, re-dated and reassessed over several decades, include remains attributed to woolly mammoth, giant deer, brown bear, Arctic fox, lemmings and spotted hyaena, alongside smaller mammals and carnivores. Not every species necessarily lived together at the same moment: the cave collection accumulated across long periods, while revised dating has shown that some older measurements underestimated the true age of specimens. Still, the assemblage establishes that Ireland periodically supported a far richer Late Pleistocene mammal community than the later, isolated island would possess.

Open grassland, herb-rich steppe-tundra, damp hollows and patchy scrub are reasonable environmental interpretations, especially for areas used by grazing animals. Such terrain could sustain reindeer and, at intervals, larger browsers and predators. Hyaenas and other carnivores may themselves have transported carcass parts into caves. This possibility is particularly relevant at Castlepook: even if the reindeer femur bears a human-made cut, the bone need not show that butchery took place inside the cave. A kill or processing site may have been elsewhere, with the discarded limb later scavenged and carried underground.

People: A Possibility, Not a Population

If people reached Ireland around this period, they were Upper Palaeolithic hunter-gatherers. Across north-west Europe, groups of this broad kind relied on stone, bone and wooden equipment, moved according to season and resources, and maintained social connections over landscapes much larger than later farming territories. That wider comparison helps explain how a brief visit to Ireland is possible. It must not be mistaken for direct evidence that particular continental cultural traditions, cave art, costume, language or ritual practice existed in Ireland.

There is no basis for discussing Irish political affairs, diplomacy or organised warfare in 31,226 BCE. There were no known states, rulers, frontiers, written agreements or monuments on the island. A solitary modified bone cannot reveal kinship rules, leadership, gender roles, language or beliefs. Nor is there evidence for religious sites, formal burial, art, schooling, farming, herding, metalwork, markets or exchange networks in Ireland at this date. Silence on these subjects is not a failure of imagination; it is the consequence of a record too slight to bear them.

Everyday life can be approached only at its narrowest. If the femur’s mark is anthropogenic, it implies the practical knowledge to use a sharp-edged tool on a large animal carcass. It may reflect the recovery of meat, marrow, hide or sinew, but the single mark does not demonstrate which product was sought. A visiting party might have travelled lightly, carried portable tools and followed animals through seasonal terrain. Those are plausible interpretations, not excavated facts. The absence of tools and hearths may reflect brief use, later glacial erosion, burial beneath sediments or simple failure to find the relevant site; none of those explanations can be chosen with confidence.

What Survives of This Moment

The later expansion of the British–Irish Ice Sheet profoundly reworked Irish landscapes. Glacial erosion, deposition and subsequent sea-level change probably destroyed, buried or displaced many fragile traces that a short-lived Palaeolithic visit might have left: campsites, footprints, hearths and exposed

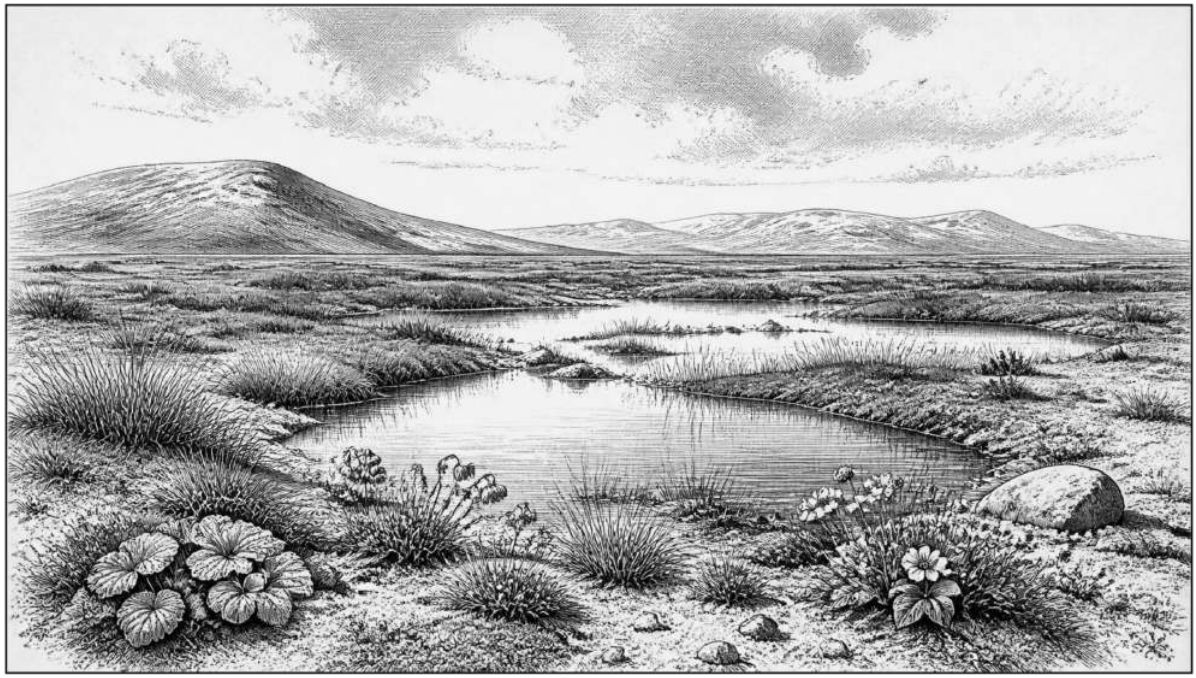
coastal activity areas. This helps explain why Ireland’s record is so sparse, but it cannot turn absence into proof of an unseen population. Archaeology must distinguish what ice may have erased from what has actually been demonstrated.

The strongest historical statement for Ireland around 31,226 BCE is therefore modest but consequential. The island formed part of a cold, fluctuating Late Pleistocene world in which ice, water, open vegetation and mobile animal herds repeatedly reshaped opportunities for life. Castlepook Cave preserves a reindeer femur close to this broad date, possibly marked during human butchery. If confirmed by further microscopic study and securely excavated evidence, it may represent the earliest known human activity in Ireland. For now, it is a compelling threshold: not the foundation of an Irish society, but a fragile clue that people may have entered an Ice-Age Ireland long before settlement became archaeologically visible.

Chapter 076 of 100

31225 BCE

Derryvree’s Tundra Garden [76]



“31,225 BCE” is a useful modern label, not a date at which Ireland can be described year by year. No calendar, writing, named people or political communities are recoverable from the island at this depth in time. In archaeological terms the label sits at roughly 33,175 calibrated years before present (where “present” is AD 1950), during the Late Pleistocene and Marine Isotope Stage 3. The evidence closest to it is measured in broad ranges, not seasons or single years. The most informative Irish record is a freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh, whose calibrated range encompasses this notional year.

A Year Inside a Range

Derryvree was exposed accidentally in roadworks in February and March 1969, when a cutting passed through a drumlin. Beneath the modern field lay a striking sequence: a lower layer of till, deposited by glacier ice; then fine sand, silt and organic material laid down in freshwater; and, above them, another thick till. This was not a settlement layer. It was an environmental archive sealed between two episodes of glaciation. Its very structure shows an earlier ice advance, an interval in which the locality was free of glacier ice and supported water and vegetation, and a later advance that buried the evidence beneath fresh ice-borne debris.

Organic sediment from the intervening layers produced the radiocarbon determination BIRM-166: 30,500 radiocarbon years BP, with a substantial published uncertainty of +1,170/−1,030 years. Radiocarbon years are not calendar years. Atmospheric carbon-14 levels have altered over time, so measurements must be calibrated against independently dated records. Using modern calibration, the Derryvree determination is generally expressed as about 36,900–31,700 calibrated years BP, or

approximately 34,950–29,750 BCE. Thus 31,225 BCE falls within the range, but cannot be attached to a particular bed, animal, human visit or climatic event. The range is not a failure of research: it is the genuine resolution of the evidence.

Freshwater Beneath the Drumlin

The Derryvree deposits illuminate a harsh but living landscape in south Fermanagh. Fossil pollen, plant macrofossils, mosses and insects point to open tundra vegetation and a periglacial climate. Grasses, sedges and herbs occurred in an exposed, largely treeless country. Moss-rich ground and wet hollows surrounded freshwater pools or slow-moving water. Finds include bogbean, mountain-avens and lesser clubmoss: plants able to survive short growing seasons, cold soils and intense seasonal contrasts. A few pollen grains from trees do not demonstrate local woodland; the original investigators warned that they might have travelled far or been reworked. The strongest signal is of sparse, northern vegetation rather than forest.

Such evidence permits a vivid but bounded reconstruction. In a warmer part of the year, shallow water could have supported aquatic plants and accumulated fine sediment, while low vegetation spread over wetter ground and wind-scoured mineral soils. In winter, freezing conditions, snow, frost-shattered ground and prolonged darkness would have transformed the same terrain. Yet it would be wrong to turn this into a precise weather report for the whole island. Derryvree was one locality, and the sediments represent accumulated environmental conditions over time. They demonstrate that north-central Ireland could be ice-free during this interval; they do not prove that every region was equally open, wet or habitable.

The landscape itself was unstable over the longer term. The lower and upper tills at Derryvree record glacial movement before and after the freshwater episode. Elsewhere in Fermanagh, at Greenagho, organic material beneath till also indicates non-glacial conditions in the broad Middle Midlandian interval, although its dating has limitations. Together these sites show that Ireland’s last glacial cycle was not a single, unchanging blanket of ice. Ice margins expanded and retreated, while cold, ice-free environments could persist between glacial phases. Later growth of the Irish Ice Sheet would radically remodel much of the land and destroy or bury many earlier surface traces.

Animals and the Cave Record

Derryvree does not provide a large-mammal bone assemblage, but cave deposits elsewhere reveal that Late Pleistocene Ireland supported cold-adapted and open-country animals at various times before the Last Glacial Maximum. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork is especially important. Its antiquarian excavations produced remains attributed to reindeer, mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. These animals should not be imagined standing together in one herd or representing one day in the cave: deposits accumulated through different episodes and by different processes. Nonetheless, the assemblage establishes that a varied Pleistocene fauna reached Ireland during the wider pre-maximum glacial period.

Caves are complicated archives. Carnivores may drag carcasses and bones underground; animals can die naturally in passages; water can redistribute remains; and early excavations often removed deposits before modern recording methods existed. A bone dated to a particular period establishes the age of that animal, not necessarily the date of every scratch upon it or the date at which it entered a cave. These cautions matter particularly at Castlepook, where modern reassessment and improved laboratory

procedures have shown that some earlier Irish faunal dates require revision. The archaeological importance of old museum collections lies precisely in their capacity for re-examination rather than in their being final verdicts.

The Reindeer Question

A reindeer femur from Castlepook has made this period unusually significant for Irish prehistory. It has been reported as dating to about 33,000 years ago and carries a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone implement while the bone was fresh. If that interpretation is confirmed, it would indicate that people reached Ireland during the Upper Palaeolithic, far earlier than the previously accepted terminal-Pleistocene evidence from County Clare. It would not demonstrate a village, a permanent population, a named group or a continuous occupation. At most, it could record a brief encounter: perhaps the processing of a reindeer carcass by a small travelling party.

That distinction is essential. No securely associated stone-tool assemblage, hearth, dwelling floor, human burial or repeated occupation surface has been identified for Ireland around this date. The femur's age and the interpretation of its surface mark are separate evidential questions. A radiocarbon date can place the animal within a wide span; microscopic and taphonomic study must decide whether the mark is human-made, and whether it was produced close to the animal's death. The responsible conclusion for 31,225 BCE is therefore conditional: human presence is possible, perhaps even plausible, but remains far less securely demonstrated than the cold-environmental record at Derryvree.

Society Beyond the Evidence

There is no evidence from Ireland at this date for political authority, diplomacy, warfare, territorial boundaries or social institutions. Nor can religion, language, art, kinship arrangements or formal learning be responsibly reconstructed. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone tools, managed seasonal movement and, in some regions, produced cave art and decorated objects. Those comparisons show what human groups of broadly comparable antiquity could do; they are not proof that such practices occurred in Ireland. The island's evidence is too fragmentary to transfer European cultural achievements directly across the sea.

The same restraint applies to economy and trade. If people did visit, reindeer would have offered meat, marrow, hide, sinew, bone and perhaps antler. But the Castlepook femur does not reveal which materials were taken, whether the animal was hunted or scavenged, how many people were involved, or where they travelled next. No trade routes can be identified. Lower sea levels altered coastlines dramatically, but the surviving evidence does not reconstruct a precise shoreline or prove a particular route into Ireland. Mobility is a reasonable hypothesis for any possible visitors, not an established narrative of migration.

Ice, Loss and Historical Silence

By the Last Glacial Maximum, later than the Derryvree interval, Ireland was substantially—perhaps entirely—covered by ice. Research on the British-Irish Ice Sheet places its major expansion and maximum southern reach much later, chiefly between about 27,000 and 24,000 years ago in the Celtic Sea sector, with extensive ice conditions continuing into the global maximum. That later glaciation scoured

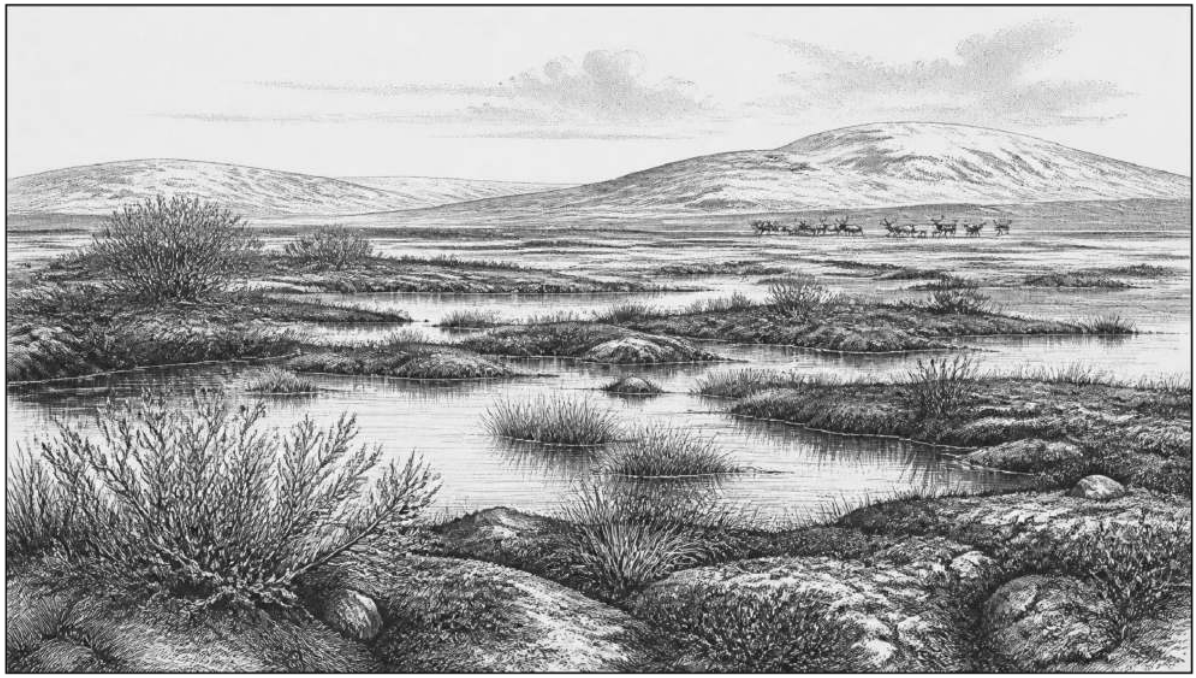
landscapes, shifted sediments and limited the survival of open-air archaeological sites. Absence of evidence for earlier settlement is therefore not conclusive evidence that no people ever arrived; equally, glacial destruction cannot be used to convert a possibility into proof.

For Ireland around 31,225 BCE, the central historical development is environmental rather than political: an ice-age landscape could briefly sustain freshwater pools, tundra plants and animal life in at least part of the north. Derryvree's sediments preserve that fact with unusual clarity. Castlepook raises a consequential question about people, but not yet a settled answer. This is an Ireland known not through chronicles or monuments, but through the delicate survival of silt, seeds, mosses, insects and bone—evidence sufficiently rich to reveal a changing world, yet too sparse to furnish an annual history.

Chapter 077 of 100

31224 BCE

Castlepook’s Rangifer Femur [77]



The label “31,224 BCE” is a modern way of locating a point deep in the Late Pleistocene, not a date at which Ireland can be described year by year. There are no written records, settlements with annual sequences, or archaeological deposits that can be tied responsibly to that single calendar year. By the conventional conversion from “before present” (where present is AD 1950), it corresponds nominally to about 33,173 calendar years BP. That arithmetic is useful for orientation, but it must not be mistaken for chronological precision. Radiocarbon dates of this age have wide calibrated ranges, and environmental layers may have formed over generations or centuries.

The closest evidence belongs to the later part of Marine Isotope Stage 3, a fluctuating cold phase before the Last Glacial Maximum. Ireland was neither a familiar green island nor uniformly a blank sheet of ice. Its landscapes, coastlines and ice margins changed repeatedly over long periods. The most responsible picture for this point is therefore one of sparse but important evidence: a buried wetland in Fermanagh, cold-stage animal remains in southern caves, and a disputed clue to human activity at Castlepook near Doneraile in north County Cork.

A Date Without an Anniversary

Chronology is the first difficulty. The Derryvree deposits near Maguiresbridge, County Fermanagh, produced the conventional radiocarbon determination BIRM-166, 30,500 years BP with an uncertainty of roughly a thousand years. The date comes from organic sediment, not from a person, tool or campfire. When calibrated, such a result belongs broadly in the mid-to-late thirties of thousands of calendar years BP; published modelling and recalibration underline that its uncertainty is substantial. It nevertheless demonstrates something fundamental: before later ice overrode the locality, freshwater sediments, plants and small animals accumulated there during an ice-free interval.

That does not prove that Derryvree looked exactly the same in 31,224 BCE, or that the whole island shared its conditions. Nor can it fix the duration of a particular thaw, summer or season. It is evidence for a regional environmental window. The requested year lies close enough to this poorly resolved horizon for the deposit to be highly relevant, but not close enough to license an imagined diary of events.

The Derryvree Wetland

Derryvree is exceptional because later glacial deposits sealed an older freshwater layer between two tills within a drumlin. Road works exposed silts, fine sands and organic mud that preserved pollen, plant macrofossils, mosses and insect remains. These traces point to an open, treeless, periglacial landscape: cold ground, short growing seasons, sparse dry-land vegetation and wet hollows or shallow pools rich enough to support aquatic and marsh plants. Sedges and grasses were important, while dwarf shrubs and herbs formed a low cover rather than woodland.

The flora included cold-adapted elements such as mountain-avens and alpine clubmoss, alongside mosses and wetland plants including bogbean and water-milfoil. Such finds should be read carefully. They establish that suitable habitats existed locally; they do not provide a complete inventory of all Irish plants at one moment. Pollen can travel, preservation is selective, and a road-cut sample represents one basin rather than an island-wide survey. Even so, the combined record makes the main conclusion secure: this was tundra-like country, not forest, farm or peat bog in the later Irish sense.

The insects strengthen that conclusion. Beetle and other invertebrate evidence has been interpreted as indicating mossy, waterlogged ground with open pools and exposed terrain nearby. The practical landscape was likely difficult but biologically varied: frozen or frost-shattered ground in winter, meltwater and saturated soils in warmer months, and small sheltered niches among sedges, mosses and low vegetation. It was a living environment rather than a sterile ice desert.

Animals in the Southern Caves

Castlepook Cave, also known as Mammoth Cave, preserves the richest known Irish assemblage of mammals from this part of the last cold stage. Excavations between 1904 and 1908 recovered a very large collection, now much reduced and dispersed by the history of collecting, from passages with names such as Elephant Hall, Hyaena Hall and the Gallery of Irish Elk. Radiocarbon dating undertaken by the Irish Quaternary Fauna Project showed that bones from the cave did not all belong to one episode. They accumulated over many thousands of years, and some deposits were disturbed or re-sorted. Consequently, Castlepook is a crucial faunal archive but not a single, neatly sealed hunting floor.

The dated fauna demonstrates that Ireland supported, at different times before the Last Glacial Maximum, reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Reindeer, mammoth and giant deer indicate extensive open feeding grounds; hyaenas and wolves show that large predators shared them. The image is often called mammoth-steppe, but that shorthand should not erase local variation. Limestone caves, sheltered valleys, wet basins and wind-exposed uplands would have offered different resources. Derryvree’s wetland and Castlepook’s animal bones together suggest a patchwork of open cold-climate habitats rather than one uniform plain.

The presence of spotted hyaena is particularly striking. It is known in Ireland from Castlepook, and its bones and coprolites show that the cave system was used by carnivores as well as serving as a trap, shelter or collecting place for bones. A cave assemblage therefore cannot automatically be treated as a list of

animals hunted by people. Carnivore scavenging, natural deaths, water movement and early excavation methods all complicate the story. The evidence proves a rich animal community; it does not measure herd sizes, establish annual migrations, or show that every species lived together at the exact same time.

The Reindeer Mark

The most consequential human question concerns a reindeer femur from Castlepook. Re-examination of the bone identified a deep mark interpreted by palaeozoologist Ruth Carden and presented by Cork County Council as damage made by a stone tool during butchery. It has been assigned broadly to about 31,000 BC in heritage interpretation. If that reading and association are sustained, it would extend evidence for human handling of an animal in Ireland far beyond the formerly accepted Late Upper Palaeolithic evidence from Alice and Gwendoline Cave in County Clare, dated to around 12,800–12,600 cal BP.

Its importance requires restraint. A modified bone may demonstrate that a person cut or processed a reindeer; it does not establish a permanent population, a named group, a camp, a voyage route or a settlement at Castlepook. No securely associated hearth, occupation surface, stone-tool assemblage, dwelling, burial or repeated butchery concentration has yet been demonstrated for this horizon. Moreover, the animal bone’s age and the moment when a surface mark was made are separate analytical questions. Castlepook’s mixed and historically excavated deposits make context especially important.

The fair conclusion is therefore provisional but significant. Ireland may have received very early Upper Palaeolithic visits or short-lived incursions while cold-stage fauna occupied the island. The femur is not proof of a settled Irish society in 31,224 BCE. It is, rather, a reason to search for one and to reassess an archaeological record heavily damaged, buried or removed by later glaciation.

People, Society and Silence

There is no evidence from Ireland at this date for political institutions, leaders, territories, diplomacy, warfare, formal religion, writing, agriculture, villages or trade networks. Those subjects should not be filled with later Celtic traditions or with general images of “Ice Age tribes”. If people reached Ireland, they were mobile hunter-gatherers whose material traces have not survived in a securely dated Irish context beyond the possible reindeer butchery mark. Their social organisation, language, beliefs, clothing, dwellings and family life are unknown.

Comparison with contemporary Upper Palaeolithic communities in Britain and continental Europe can suggest possibilities, not Irish facts. Elsewhere, people used stone, bone, antler, hide and fire; they moved through seasonal landscapes and exchanged knowledge across large areas. Such comparisons make a stone-tool interpretation at Castlepook plausible, but cannot supply Ireland with an art tradition, ritual site or economic system for which no evidence has been recovered. The most defensible cultural history here is the history of absence, preservation and inference.

Ice, Sea and Connection

Regional change was the overriding political force only in a metaphorical sense: ice, climate and sea level determined what routes and habitats could exist. Research on the British–Irish Ice Sheet increasingly shows a complex history of growth and retreat before the Last Glacial Maximum. Derryvree proves local

ice-free conditions before the site was covered by later till, while wider evidence suggests that ice sheets were developing dynamically around Ireland. There is no warrant for drawing a single coast outline for the exact requested year.

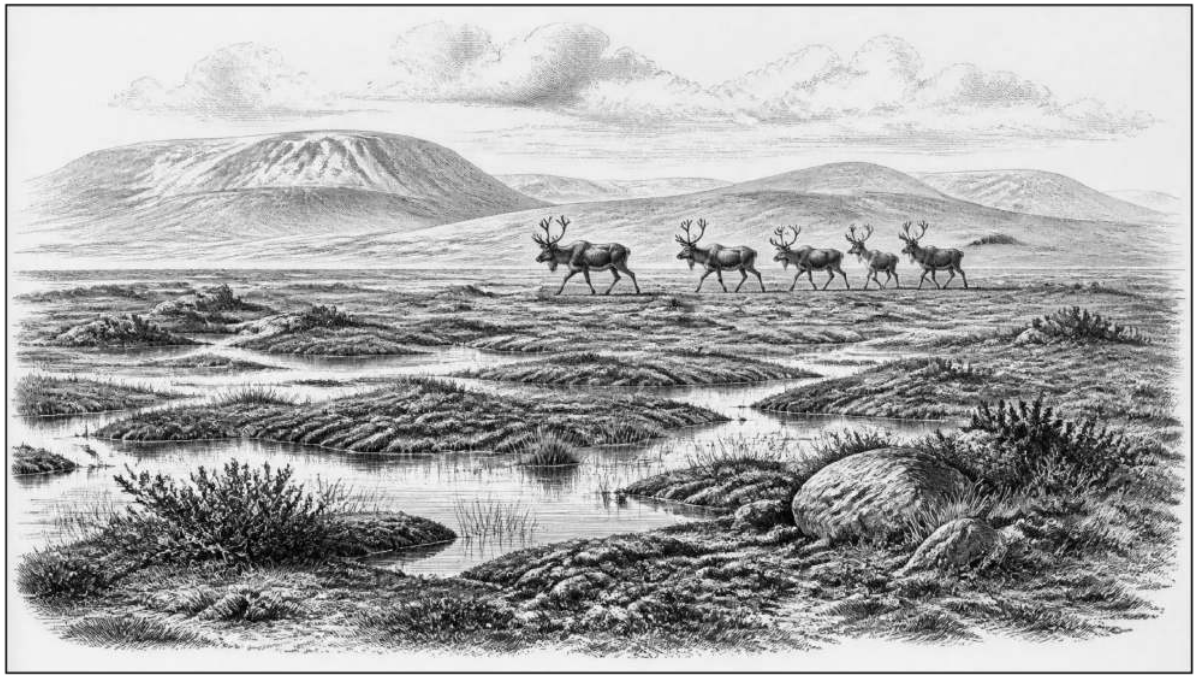
Lower global sea levels altered the Irish Sea region, but whether particular routes between Ireland and Britain were open land, narrow-water crossings or ice-affected barriers changed through time and remains debated. The pre-Last Glacial Maximum fauna demonstrates that animals reached Ireland during this broader period. It does not by itself identify the route taken by a reindeer, hyaena or person. For human movement, the essential result is modest: Ireland was not necessarily beyond reach, but it remained peripheral, environmentally demanding and archaeologically elusive.

Thus 31,224 BCE belongs not to a year of known Irish kings, battles or monuments, but to a deep environmental chapter. A Fermanagh wetland records cold-water life beneath a future drumlin; Cork caves retain fragments of an unexpectedly diverse fauna; and one marked reindeer bone poses a serious, unresolved question about early people. Together they reveal an Ireland of tundra, animals and changing ice—a place known principally through the survival of small, difficult pieces of evidence.

Chapter 078 of 100

31223 BCE

Derryvree’s Frostbound Reedbeds [78]



31,223 BCE is a modern chronological label, not a recoverable year in Ireland’s human past. No community on the island is known to have kept a calendar that can be aligned to it, and neither archaeology nor palaeoclimate can identify an occurrence in that particular year. The responsible perspective is a broad one: this notional date falls about 33,173 years before AD 1950, within Marine Isotope Stage 3, a long and climatically unstable part of the Late Pleistocene. The closest Irish evidence is dated in wide ranges, not annual points. Most importantly, freshwater sediments at Derryvree, near Maguiresbridge in County Fermanagh, have been calibrated broadly to c. 36,900–31,700 calendar years before present. They permit a cautious reconstruction of an Irish Ice Age environment that could include this date, but cannot describe a single season or day.

An Island in a Changing Ice Age

Ireland was not yet the green, wooded island familiar from later prehistory and history. It lay within the northern Atlantic fringe of Europe during a cold stage in which glaciers expanded and contracted, sea levels stood far below their modern level, and climates shifted sharply over centuries and millennia. The Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest Late Pleistocene extent, lay ahead rather than fully established at this point. Its build-up was neither simple nor uniform. Different parts of Ireland experienced different combinations of ice cover, periglacial frost action, bare ground, wet hollows and open vegetation.

The numerical year therefore should not imply that all Ireland shared one weather pattern. A deposit in Fermanagh records local conditions; a cave fauna in Cork records animals that entered, died near, or whose remains accumulated in a particular limestone system. Together, such archives show that parts of

the island were intermittently capable of supporting life between glacial advances. They do not supply a complete map of the island, still less a political or cultural map.

Freshwater Beneath a Drumlin

Derryvree is the clearest window onto this broad interval. Roadworks in 1969 cut through a drumlin, exposing organic-rich freshwater silts and fine sands trapped between two substantial layers of till: debris laid down by moving glacier ice. The sequence establishes an important relative order. Glacial ice deposited the lower till; afterwards, the locality supported freshwater and wetland deposits; later ice laid down the upper till. The organic bed is therefore evidence for an ice-free interval at that place, rather than proof that the whole island was free of ice at once.

Its plant and insect remains indicate a treeless, waterlogged landscape often described as muskeg or tundra wetland. Mosses, sedges, grasses, dwarf shrubs and herbs grew around shallow pools and saturated ground. Plants such as bogbean and water-milfoil are particularly valuable because their remains show that standing or slow-moving freshwater existed locally. The evidence does not conjure a lush marsh. It instead suggests a demanding environment with short growing seasons, hard winters, frost-disturbed soils and vegetation low to the ground. Open water, mossy margins and sedge-rich patches would have made a varied but fragile habitat.

This is direct environmental evidence: it comes from preserved sediments, pollen, plant macrofossils and insects. The wider portrait of a cold, highly seasonal climate is an interpretation built from those remains and comparisons with northern and alpine environments. It is a strong interpretation, but it must retain its local scale. Derryvree was not a weather station for every valley, coast and upland in Ireland.

Animals of the Open Country

Late Pleistocene animal remains from Irish caves show that the island periodically supported a fauna far more varied than that of later millennia. Castlepook Cave, near Doneraile in north County Cork, is especially important. Its historic excavations produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, hares, lemmings, stoat and spotted hyaena. Some dates and cave contexts have been reassessed as laboratory techniques improved, so the assemblage cannot safely be imagined as one simultaneous herd-and-predator scene outside the cave. Yet the broad conclusion is secure: cold-adapted and open-country mammals repeatedly reached southern Ireland during the middle part of the last glacial cycle.

Reindeer are particularly eloquent indicators of open terrain, although their presence at a cave cannot establish the exact appearance of the surrounding countryside in one year. Mammoth and giant deer likewise imply that, at least in suitable episodes and districts, the island contained enough forage and access routes for large herbivores. Hyaena, wolf and bear remains reveal a food web with scavengers and predators as well as prey. Such animals moved through a landscape where seasonality mattered: summer grazing, winter shelter, migration corridors and the availability of unfrozen water would all have shaped their ranges.

The Human Question

There is no securely excavated settlement, hearth, house, tool assemblage or burial from Ireland that can be assigned to 31,223 BCE. Consequently, it would be wrong to describe an Irish population, a tribe or a settled hunting camp at this date. The absence is meaningful, but it is not conclusive proof that nobody ever visited. Later glaciation eroded landscapes, rearranged sediments and buried older surfaces beneath till, while cave collections were often excavated before modern standards of recording and dating.

A reindeer femur from Castlepook has nevertheless made the question more interesting. One deep mark has been interpreted as damage made to fresh bone by a sharp stone implement, potentially during carcass processing. If that reading is confirmed, it would indicate a brief Upper Palaeolithic human presence in Ireland around the wider period represented by the animal remains—far earlier than the previously accepted terminal-Pleistocene evidence from County Clare. However, the bone lacks the securely dated archaeological context that would transform a single marked specimen into proof of a camp or enduring occupation. Carnivore activity, breakage, sediment movement and the limitations of older excavation records all require caution.

The most responsible conclusion is therefore deliberately modest. People may have made short visits to Ireland during favourable episodes of Marine Isotope Stage 3, perhaps following game or exploiting a carcass. That remains a hypothesis under investigation, not an established annual event. There is no evidence from which to infer named individuals, kin groups, languages, political leadership or a permanent population.

Society Without States

Political affairs, diplomacy and organised warfare cannot be reconstructed for Ireland at this depth of time. There are no written records, monuments, territorial boundaries or assemblages demonstrating conflict. Nor is there evidence for farming, stock keeping, permanent villages, formal trade routes or ritual institutions. Terms such as “Ireland” and “island” are geographical conveniences here, not labels for a prehistoric polity. Sea levels were lower, coastlines lay farther out in many areas, and the land’s connections with Britain and continental Europe altered through time. Animal movements demonstrate that access was possible in some intervals, but they do not prove a simple, continuous land bridge usable by people at every moment.

If humans were present, comparison with Upper Palaeolithic groups elsewhere in north-west Europe suggests that mobility, close knowledge of animal behaviour, seasonal planning and portable equipment would have mattered more than fixed settlement. This is analogy, not Irish evidence. Ireland has not yielded stone tools, worked bone, dwellings or art that can establish such practices for this horizon. The only firm cultural statement is negative but important: no demonstrable indigenous cultural tradition can yet be assigned to the year or to the Derryvree interval.

Resources, Movement and Risk

For animals—and for any occasional human visitors—the economy of survival was ecological rather than agricultural. Reindeer, giant deer and other herbivores converted sparse vegetation into meat, fat, hide, sinew, antler and bone; predators and scavengers competed for the same carcasses. Wetlands provided water and specialised plant communities, but also impeded movement. In a cold landscape,

access to sheltered ground, fuel, fresh water and reliable hunting opportunities could determine whether a short visit was viable. These are reasonable deductions from the environment, not discoveries of a particular camp’s activities.

There is equally no evidence for exchange or commerce. Materials might have moved with travellers if people reached Ireland, but no identified imported stone, ornament or other artefact demonstrates this. The appropriate image is not of trade between communities but of a changing north-west European landscape in which glaciers, low seas, animal ranges and severe seasons created temporary possibilities and severe constraints.

Renewed Ice and Lost Landscapes

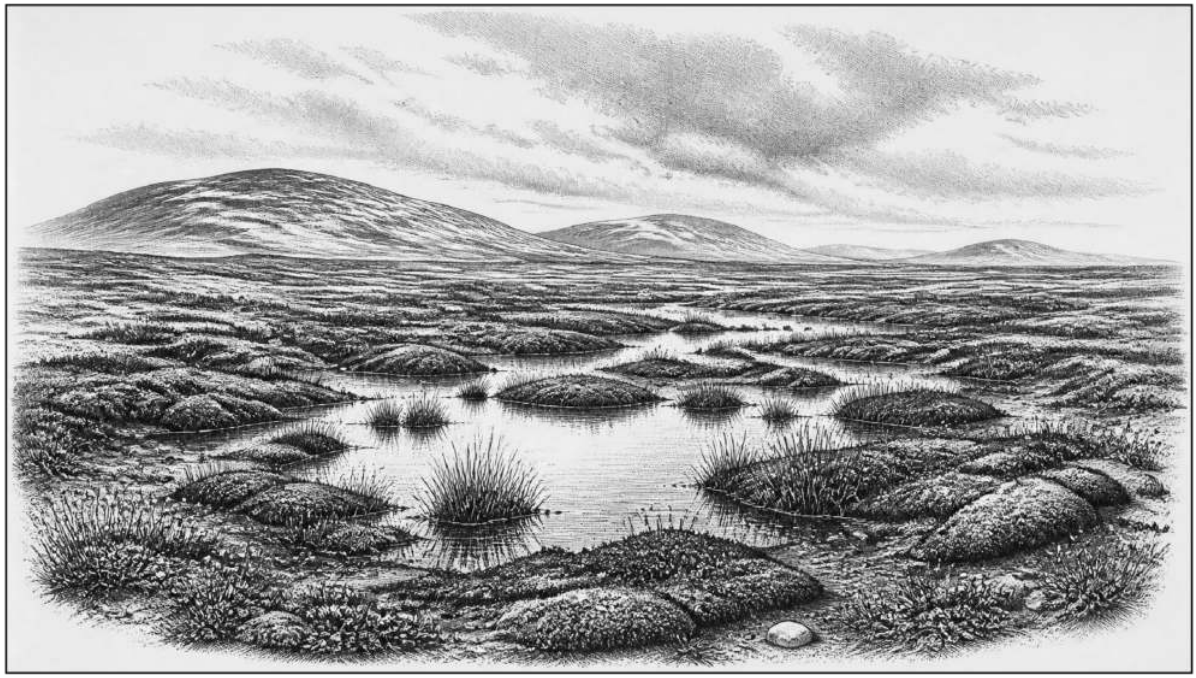
The Derryvree wetlands did not endure unchanged. The upper till that sealed them records a later return of glacier ice. Across Ireland, the growth of the British–Irish Ice Sheet would reshape valleys, scour rock, redirect drainage and remove or conceal many earlier deposits. That destructive history explains why evidence for the deeper Palaeolithic is so scarce. It also makes surviving sequences unusually valuable: a buried freshwater bed beneath a Fermanagh drumlin and a faunal cave deposit in Cork preserve fragments of a world otherwise largely overwritten by ice.

For this point around 31,223 BCE, then, Ireland cannot be narrated through kings, battles or foundations. Its history is one of ecological change. Derryvree’s sedges and mosses, shallow pools and frost-bound ground show a locally ice-free wetland during a wider cold stage. Castlepook’s animals show that large mammals could reach and use parts of the island. The possible marked reindeer bone keeps open, but does not settle, the question of early human visitation. The evidence is sparse; its limits are part of the story.

Chapter 079 of 100

31222 BCE

Derryvree’s Intertill Moss Bed [79]



The label 31,222 BCE cannot denote a known event in Ireland. No people in Ireland then kept a calendar, no written record survives, and archaeological dating at this depth of time cannot resolve a single modern calendar year. Used as a filing point, it corresponds only approximately to 33,170 years before 1950. The responsible historical setting is therefore a broad one: later Marine Isotope Stage 3, within the last glacial cycle, perhaps broadly c. 34,000–32,000 calibrated years before present. Even that range should be treated as a guide rather than a date for one season or generation.

Ireland at this point lay on Europe’s north-western edge during a time of climatic instability and growing ice. It was not yet the fully ice-drowned Ireland of the Last Glacial Maximum, which came later, but it was moving towards that transformation. Evidence from fossil-bearing sediments, caves, glacial landforms and radiocarbon dating offers glimpses of a severe, open and changing landscape. It does not provide a year-by-year narrative of settlements, rulers or battles. The clearest story is environmental: how plants and animals occupied temporary habitable ground, and how advancing ice would eventually erase or bury much of that world.

A Date Beyond Calendar Precision

Converting 31,222 BCE into archaeological time requires care. Radiocarbon laboratories report ages in radiocarbon years before present, with “present” conventionally fixed at 1950. Those results then require calibration against independent records of past atmospheric carbon. A radiocarbon determination is also expressed with an uncertainty range, and the relationship between radiocarbon and calendar years is not a simple subtraction. The date used here should consequently not be matched to an individual bone, campsite or climatic shift.

For Ireland, the relevant evidence belongs to a wider Middle Midlandian or mid-last-glacial interval. The terminology reflects a regional geological tradition, while Marine Isotope Stage 3 is the broader international climatic framework. During this long period, temperatures varied sharply on millennial scales. Some intervals allowed tundra, wetlands and grazing animals to spread across exposed land; colder phases brought permafrost, sparse plant cover, stronger frost action and ice expansion. It is safer to describe 31,222 BCE as lying close to the onset of the final major growth of the British–Irish Ice Sheet than to claim that one precise glacier margin stood at one precise place.

The Derryvree Evidence

The most evocative Irish local archive for this general period lies at Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed freshwater silts and fine sands trapped between two thick tills: sediments laid down by ice, below and above the organic bed. The intervening deposit contained plant remains, pollen, mosses, seeds and insects, preserving a short-lived ice-free episode before later glaciation covered it.

An early radiocarbon determination from the Derryvree organic material was 30,500 radiocarbon years before present, with a substantial error margin. It cannot be converted into an exact contemporary calendar year, but it places the deposit within the cold middle part of the last glacial cycle and makes it directly relevant to the broad world considered here. Its flora points to open tundra and wet ground rather than woodland. Mosses, sedges and cold-adapted flowering plants survived around shallow water, saturated soil and patches of bare mineral ground. Pollen was scarce and badly preserved, itself a reminder that plant cover was thin and that this is a fragmentary record, not a complete census.

Derryvree matters because it corrects two misleading pictures. First, Ice Age Ireland was not always a single uninterrupted ice sheet. Second, an ice-free interval was not necessarily mild, green or hospitable in a modern sense. The site suggests a periglacial wetland: ground affected by intense freeze-and-thaw, with standing water in summer, seasonal snow, exposed sediment and a short growing season. The later till above it records the loss of that habitat beneath renewed ice.

Open Country in the South

Cave deposits in the south show that Ireland supported a striking large-mammal fauna during parts of Marine Isotope Stage 3. Castlepook Cave near Doneraile, County Cork, is particularly important. Antiquarian excavations there recovered thousands of bones, including remains attributed to mammoth, reindeer, giant deer, brown bear, cave hyena, hare, fox, lemming and wolf. Nearby and comparable southern sites, including Shandon and Foley caves, extend the evidence beyond one locality.

These caves must not be read as ordinary living floors or as a simultaneous animal community. Bones could enter through fissures, be dragged in by carnivores, accumulate over thousands of years, be moved by water or sediment, and be disturbed by the early excavations that removed much of the original stratigraphy. Modern re-dating has demonstrated that some older radiocarbon measurements underestimated the antiquity of the southern Irish fauna. The strongest conclusion is thus deliberately modest: before the Last Glacial Maximum, at different times, parts of Ireland were accessible to a varied cold-climate fauna with continental European connections.

Reindeer and mammoth evoke a grass-rich, largely treeless setting, but their presence does not mean that all Ireland was uniform steppe. Derryvree’s wet mossy hollows and Castlepook’s limestone cave country represent different parts of a varied landscape. Rivers, lake margins, thin soils, exposed rock and

sheltered valleys would have created local niches. Carnivores such as hyena and wolf imply food chains sustained by herbivores, while bears also used caves. Yet animal bones alone cannot tell us how numerous any species was, how long it persisted in one valley, or whether it occupied the island continuously.

People: A Possibility, Not a Population

The question of people is the most arresting and the most uncertain. A reindeer bone from Castlepook has been reported with a mark interpreted as made by a sharp stone tool, and direct dating has placed it broadly around 33,000 years ago. If that interpretation is sustained, it would indicate a fleeting Upper Palaeolithic human presence in Ireland long before the better-known Mesolithic settlement after the last ice age. It would not demonstrate a permanent colony, a village, or an Irish population continuing through the glacial maximum.

The evidential burden is high. A cutmark must be distinguished from damage caused by excavation, trampling, carnivore teeth, sediment movement or natural fracture. A single marked bone, separated from its original archaeological context by old excavation and cave processes, cannot reveal the number, language, identity or intentions of any visitors. No securely associated hearth, house, tool-making floor, burial or structured refuse deposit is known for Ireland at this date. The cautious formulation is that hunters may have reached or briefly used parts of the island during a pre-maximum window; sustained occupation remains unproven.

That caution governs political history too. There is no evidence for polities, leaders, territory, diplomacy or organised warfare in Ireland around 31,222 BCE. If people did enter this landscape, they would have done so as small, mobile foraging groups within wider north-west European networks, not as inhabitants of a recognisable later Irish society. Nor is there evidence for trade in the later sense. Movement of people and animals could have occurred when lower sea levels exposed broad coastal plains and reduced marine barriers, but the exact routes between Ireland, Britain and continental Europe remain debated.

Subsistence Without Settlements

A possible human visit would have depended on the seasonal geography of game, fresh water and shelter. Reindeer could offer meat, hide, sinew, antler and bone; other animals had different potential value. Caves, however, were often carnivore dens or natural traps rather than human homes. The archaeological record does not permit a reconstruction of camps, clothing, hunting methods or food-sharing practices in Ireland itself. Such details are known from Upper Palaeolithic sites elsewhere in Europe, but applying them wholesale to Ireland would turn analogy into fact.

There is likewise no evidence here for farming, herding, pottery, metalworking, monuments or written learning. Religion and artistic culture are beyond direct recovery for this particular Irish horizon. People elsewhere in Europe made ornaments, images and complex stone tools during the Upper Palaeolithic, but none can responsibly be assigned to Ireland in 31,222 BCE. The culture best documented on the island is instead that of non-human life: moss spores and seeds in silt, animal bones in caves, and the geological imprint of ice.

Approaching the Ice Threshold

Regional change gives this period its importance. Large reconstructions of the British–Irish Ice Sheet indicate widespread growth from about 31,000 years ago, although the precise timing, thickness and limits varied between sectors and remain subject to revision as new dates emerge. Offshore evidence shows that ice later reached far across the Atlantic shelf west of Ireland, while landforms such as drumlins, moraines and streamlined sediments preserve the movement of ice over the island. By the global Last Glacial Maximum, conventionally c. 26,000–19,000 calibrated years ago, ice had transformed almost every Irish region.

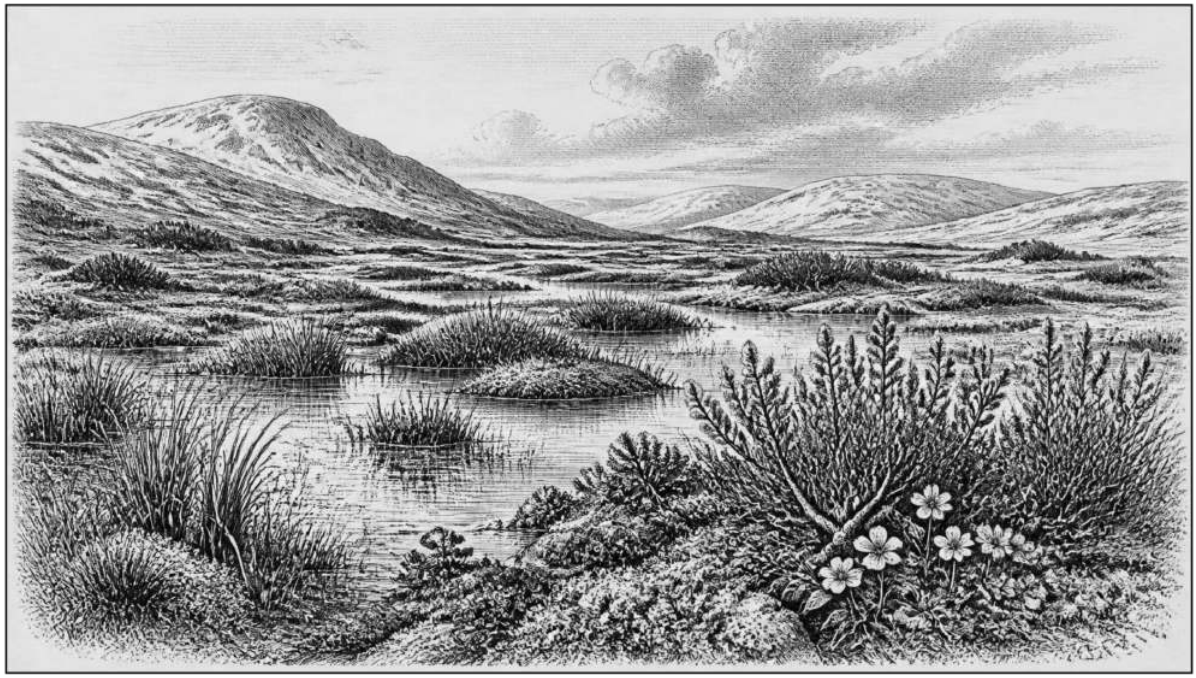
For the plants and animals represented at Derryvree and Castlepook, the consequences were profound. Habitats narrowed, shifted or vanished. Local populations may have retreated, become isolated or died out; the cave record cannot always distinguish these outcomes. The eventual recolonisation of Ireland after ice retreat was not simply a restoration of an old ecosystem. It produced new combinations of species and, much later, the securely evidenced human settlement of the island.

Thus the most truthful account of Ireland around 31,222 BCE is not a chronicle of named events but a landscape at a threshold. Fermanagh’s freshwater moss bed records an exposed, bitter wetland between episodes of ice. Cork’s caves retain bones from a larger, connected Ice Age fauna and perhaps a tantalising trace of human activity. Together they reveal an Ireland that was environmentally alive but precarious: a northern peninsula-like world of tundra, wetlands and roaming animals, soon to be overtaken by the expanding ice sheet.

Chapter 080 of 100

31221 BCE

BIRM-166’s Fermanagh Waterline [80]



“31,221 BCE” is a modern chronological label, not a year from which Ireland preserves an event, ruler, settlement or written memory. It corresponds arithmetically to about 33,170 calendar years before AD 1950, the conventional radiocarbon ‘present’, but that conversion must not be mistaken for archaeological precision. At this depth in time, dates are expressed as calibrated ranges and environmental phases. The closest Irish evidence comes from deposits that accumulated across generations or centuries, not on a named day. Ireland lay in the Late Pleistocene, within Marine Isotope Stage 3, a climatically unstable part of the last Ice Age before the fullest expansion of the British–Irish Ice Sheet.

A Date Within a Long Interval

The key record is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed a remarkable sequence in a drumlin: glacial till below, freshwater sands, silts and organic material in the middle, and a later till above. Till is unsorted debris laid down by glacier ice. The sequence therefore demonstrates a local succession of ice, an ice-free interval during which water and living things occupied the site, and renewed glaciation that buried the evidence. It does not establish that all Ireland was ice-free simultaneously, still less that Derryvree’s wetland existed in the exact modern year 31,221 BCE.

Organic material from the intervening deposit, laboratory number BIRM-166, returned a radiocarbon age of 30,500 ± 1,100 radiocarbon years BP. Radiocarbon years are not calendar years: the proportion of atmospheric carbon-14 has varied through time, and the result must be calibrated against independently constructed curves. The original error range is substantial, while calibration at this age produces broad and sometimes discontinuous calendar possibilities. Scholarship consequently places the Derryvree deposit

broadly in the later Middle Midlandian, conventionally correlated with MIS 3; calibrated discussions commonly give a span of roughly 36,900–31,700 cal BP. The nominal year here falls within that wide horizon, but cannot be attached to a particular layer, season or organism.

A Wetland Between Glaciers

Derryvree is important because it rules out a simple image of an island continuously entombed beneath ice throughout the last glacial cycle. For part of the wider interval, at least one Fermanagh locality had exposed ground, shallow or slow-moving freshwater, wet soils and vegetation. Pollen, plant macrofossils, mosses and insect remains point to an open, treeless, periglacial landscape. Sedges, grasses, herbs, dwarf willow, mountain-avens, lesser clubmoss and aquatic plants including bogbean and alternate water-milfoil indicate a patchwork of damp ground, mossy vegetation and pools rather than woodland or a sterile white wasteland.

Older descriptions use the word *muskeg* for this type of wet, organic-rich ground. It should not conjure a modern bog unchanged for 33 millennia. The deposit instead records a cold freshwater margin in which plant litter accumulated, insects lived and water supported aquatic species. Summers may have briefly encouraged growth around sheltered pools and channels; winters were severe enough for frost processes to dominate much of the landscape. The evidence supports local ecological variety. It does not yield a reliable island-wide temperature, annual snowfall total or map of every valley.

Regional contrast is central to any responsible account. Caves in the limestone country of north Cork, especially Castlepook Cave near Doneraile, preserve a very different kind of archive: animal bones, some accumulated by carnivores. The broader Irish Quaternary fauna record shows that sizeable mammals reached Ireland during portions of the period between at least about 45,000 and 20,000 years ago. At Castlepook, dated remains include reindeer, woolly mammoth, spotted hyaena, brown bear, wolf, Arctic fox, hare and lemmings. Such evidence shows that suitable routes and habitats existed intermittently for animals. It does not mean that every species coexisted at one place at one moment, or that a single cave was an ordinary picture of the surrounding countryside.

Animals, Carnivores and a Possible Human Trace

Reindeer are especially evocative, but their presence is evidence of fauna before it is evidence of people. They could have moved through open country in response to forage and seasonal conditions, while carnivores could drag carcasses or bones into caves. Castlepook’s fossil assemblage was largely recovered in antiquarian excavations, and the mixing, disturbance and recovery history of cave deposits require caution. A bone’s radiocarbon date establishes when the animal died, not automatically when a surface mark was made or how the bone reached its final resting place.

One reindeer femur from Castlepook has nevertheless transformed the question of Ireland’s early human past. Re-examined in the early 2020s, it was radiocarbon dated to around 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made on fresh bone by a stone tool during butchery. If that interpretation is sustained through further taphonomic study, it indicates a human visit to Ireland in the broad interval close to this article’s notional date—far earlier than the securely dated terminal Palaeolithic bear-bone evidence from Alice and Gwendoline Cave, County Clare, at about 12,810–12,590 cal BP.

The distinction between evidence and interpretation matters. The femur is not a house floor, hearth, stone-tool assemblage, grave, boat or repeated camp. It cannot identify the number, language, ancestry, social organisation or route of any visitors. Nor can it demonstrate a permanent population. Its strongest possible reading is narrow but profound: a person may have processed a reindeer in Ireland during MIS 3. Even that claim depends on the diagnosis of the incision and must remain open to reassessment. No year-specific human action can responsibly be placed in 31,221 BCE.

No Polities, No Proven Diplomacy

There is no evidence for political communities, named leaders, territories, warfare, diplomacy, institutions or religious observance in Ireland at this point. Such subjects are not merely unknown in detail; the surviving record does not permit them to be reconstructed. There are likewise no demonstrated settlements, domestic structures, burials, cultivated fields, monuments, metalwork, pottery or trade goods. Terms such as ‘tribe’, ‘chiefdom’ or ‘Irish people’ would import much later social categories into a world for which they have no evidential basis.

If humans did briefly reach the island, they would have belonged to the wider Upper Palaeolithic world of north-west Europe, where mobile foragers possessed sophisticated knowledge of animals, stone raw materials, seasonal landscapes and social connections. That comparison provides a possible context, not a description of Ireland. The Irish record has not yielded the material evidence needed to show whether visitors carried flint tools, crossed open water, travelled over exposed coastal shelves or arrived from Britain by another changing route. Lower sea levels altered the geography of the Irish Sea region, but Ireland was not thereby proven to have been joined to Britain by a dependable land bridge at this particular time.

Approaching Greater Ice

The wider environmental trajectory was towards more extensive glaciation. Reviews of the British–Irish Ice Sheet place its principal build-up after roughly 35–32 ka and its maximum extent later, during MIS 2, broadly around 27–21 ka. Those are regional models rather than a single clock striking everywhere at once. At approximately 33 ka, ice margins, sea level, permafrost and viable habitats could alter markedly over centuries and millennia. Some Irish landscapes may have remained exposed while other sectors were influenced by expanding local or marine-based ice.

Later glaciers also help explain the sparseness of the record. Ice erodes bedrock, reworks soils, redistributes sediment and can remove the open-air traces on which archaeologists depend. Derryvree survived precisely because its freshwater deposits were enclosed between tills; Castlepook’s caves sheltered bones, though not necessarily their original associations. Absence of a camp-site is therefore not proof that nobody ever visited. Equally, destruction of evidence cannot be used to turn possibility into certainty.

An Irish Landscape Before History

The most defensible picture for around 31,221 BCE is consequently environmental rather than narrative: parts of Ireland lay in a cold, dynamic North Atlantic landscape, with local ice-free terrain and freshwater wetlands during at least part of a broad MIS 3 interval. Open tundra-like plant communities

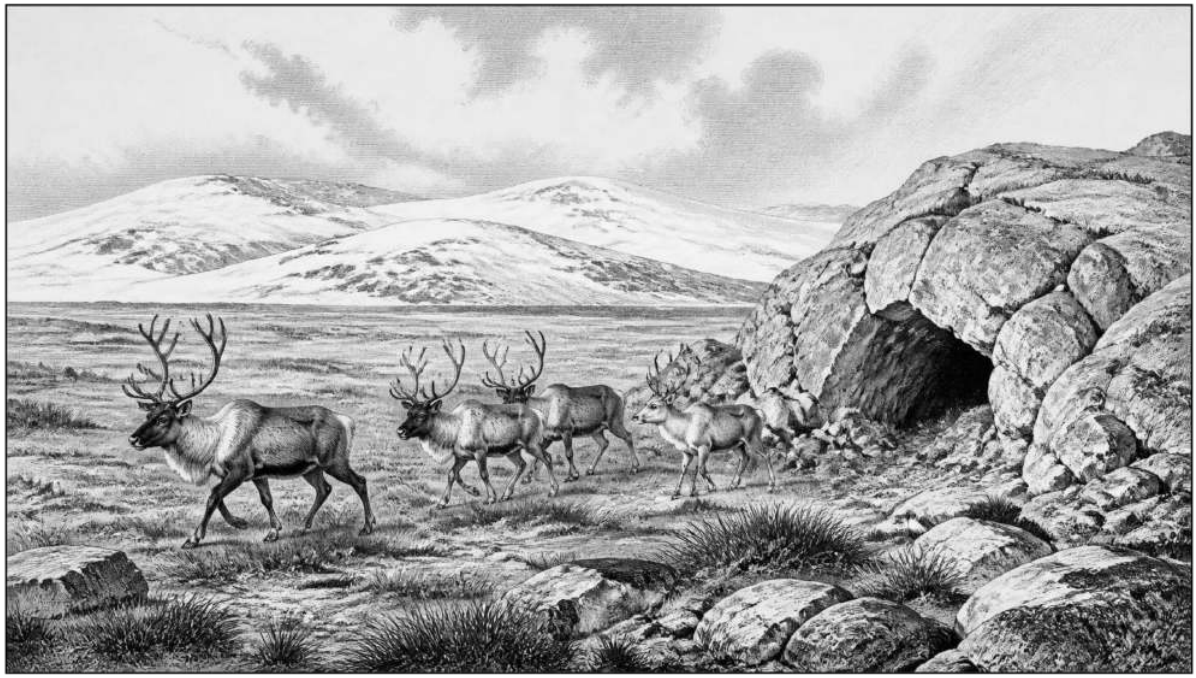
supported insects and grazing animals; caves record predators and scavengers as well as their prey. A reindeer femur from north Cork raises the serious possibility of an exceptionally early human presence, but does not yet furnish an Irish society or a calendar of events.

This is not an empty prelude to ‘real’ history. The Fermanagh silts, mosses, seeds and beetles, and the Cork cave bones, are historical evidence in their own right. They show an island repeatedly reshaped by ice, water, animal movement and climatic fluctuation long before farms, monuments, kingdoms or writing. Around this notional year, the most important development was not a political turning point but the fragile persistence of habitable ecological niches on the north-west edge of Europe—niches that later ice would conceal, disturb and, in rare places, preserve.

Chapter 081 of 100

31220 BCE

The Castlepook Reindeer Bone [81]



The label 31,220 BCE cannot denote a recorded Irish year, an event, a ruler or a season. No written calendar existed in Ireland, and the surviving evidence is far too sparse to date activity to a single modern year. It is best treated as a notional point about 33,170 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 of the last Ice Age. The most responsible account must therefore use broad calibrated ranges, geological sequences and cautiously dated animal remains rather than a conventional annual narrative.

At this point Ireland was approaching, but had not yet reached, the Last Glacial Maximum. The British–Irish Ice Sheet would expand greatly after about 31,000 years ago and reached its greatest Late Pleistocene extent in the following millennia, broadly around 27,000–23,000 years ago in the Irish sector. At c. 33,000 calibrated years before present, conditions were already severe and unstable, but the island was not simply a uniform white expanse. Its changing margins included cold open country, local snow and ice, exposed limestone uplands, valleys, wetlands and habitats capable, at intervals, of supporting sizeable mammals.

A Date Measured in Ranges

Modern calendar notation gives an impression of precision that the evidence cannot sustain. Radiocarbon measurements do not translate directly into BCE years: their results must be calibrated against independently dated records, and at this antiquity the resulting ranges can span centuries or more. Ice-core chronologies, marine sediments, cave deposits and animal bone each use somewhat different dating frameworks. A date such as 31,220 BCE is consequently a useful point of orientation, not a timestamp.

The wider climatic setting was characterised by abrupt North Atlantic shifts, often called Dansgaard–Oeschger events. Greenland ice cores preserve evidence for sharp alternations between colder stadials and relatively milder interstadials. These were not gentle seasons but major reorganisations of temperature, sea ice, wind, precipitation and vegetation over generations or centuries. Ireland lay on the Atlantic fringe of this volatile world. Its weather and ice cover would have responded to wider North Atlantic changes, though no Irish record allows the weather of one particular year to be reconstructed.

This chronology matters because it prevents two misleading pictures: an entirely ice-covered island incapable of supporting life, and a stable grassland awaiting permanent settlement. Ireland's Late Pleistocene landscape changed repeatedly. Later ice also eroded, buried and rearranged older deposits, leaving a heavily incomplete record. Absence of evidence is therefore not proof that no people or animals ever reached a place; equally, a few bones cannot establish a settled population.

Castlepook Cave and a Difficult Clue

The most directly relevant archaeological clue comes from Castlepook Cave, near Doneraile in north County Cork. This limestone cave system, sometimes called Mammoth Cave, produced a remarkable assemblage during antiquarian and early twentieth-century excavations. Its faunal remains include reindeer, woolly mammoth, giant deer, brown bear, wolf and spotted hyena. Such collections are invaluable, but they have a serious limitation: much was excavated before modern standards of stratigraphic recording, and bones may have been moved within cave sediments by animals, water, roof collapse, digging and earlier collectors.

A reindeer femur fragment from the Castlepook collections has been reported as radiocarbon dated to roughly 33,000 years ago and as carrying a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made by a sharp stone tool during carcass processing. If that interpretation is confirmed, it would be Ireland's earliest known indication of human activity by a very large margin. It would suggest that one or more Upper Palaeolithic people handled and cut a reindeer carcass in, or near, the cave during a pre-Last Glacial Maximum interval.

The conditional language is essential. The bone is not a settlement, and it is not a population census. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, art panel or stratified occupation surface of comparable age has yet been demonstrated at Castlepook. Nor does one modified bone reveal the identity, language, kinship, beliefs or route of the people who may have made the mark. Current excavation and re-examination programmes have been designed precisely to test the cave's deposits and to search for securely contextualised evidence.

Thus the strongest conclusion is modest but important: Ireland may have been visited by Upper Palaeolithic foragers around this broad period. Permanent occupation, continuous residence and a distinct 'Irish' human community cannot responsibly be inferred. The evidence supports a possibility of brief activity at the far north-western edge of European hunter-gatherer worlds, not an established prehistoric society in the later Mesolithic sense.

Reindeer Country

The reindeer bone nevertheless illuminates the landscape. Reindeer are well suited to cold, open environments, and their presence belongs with an Irish Ice Age fauna that included animals now absent from the island. Castlepook is particularly important because it preserves evidence of woolly mammoth,

giant deer and carnivores alongside reindeer. The Irish Quaternary Fauna Project showed that mammals reached Ireland at intervals between at least about 45,000 and 20,000 years ago, before the severe conditions and expanding ice associated with the glacial maximum transformed the record again.

These animals should not be imagined as inhabiting a modern Irish countryside in winter. There were no oak woods, hedged fields, farms or peat bogs of the familiar historic landscape. Vegetation was likely predominantly open and low-growing, with grasses, sedges, herbs, mosses and dwarf shrubs varying according to soil, drainage, exposure and climate. Pollen, plant macrofossils, beetles and wetland sediments from Irish Quaternary sites demonstrate that treeless cold-stage environments could include surprisingly varied local habitats: shallow pools, sedge margins, mossy ground and patches of shrub vegetation.

Yet individual animal species cannot all be assumed to have lived together at precisely 31,220 BCE. Cave assemblages often accumulate over long intervals; bones of different ages may be mixed; and direct radiocarbon dates have revised older assumptions. A mammoth or hyena bone from Castlepook establishes that its species reached this part of Ireland at some point in the Late Pleistocene, not that it stood beside the reindeer on the same day. The responsible reconstruction is a regional mosaic of periodically suitable habitats and shifting animal populations.

Predators, Scavengers and Caves

Castlepook’s spotted hyena remains are especially revealing. Hyenas can transport bones into dens, gnaw and break them, and leave accumulations that may resemble the debris of human food preparation. Wolves, bears, water movement and collapse can complicate matters further. Archaeologists distinguish cut marks from tooth damage, trampling, weathering and excavation scars by examining their form and microscopic characteristics, but early collection histories make every conclusion more difficult.

This is why the cave cannot be treated as a domestic shelter merely because it contains bones. For much of its Pleistocene history, Castlepook was probably more significant to carnivores than to people. It was a protected geological space where remains could accumulate and survive, while the open ground outside was the principal arena in which herbivores moved, predators hunted or scavenged, and any visiting people sought food. The cave’s value to historians lies in its archive of deep time, not in evidence for a cave-dwelling community.

People Without Polities

There is no evidence for political institutions, territorial kingdoms, diplomacy, warfare, chiefs or named peoples in Ireland at this date. There is likewise no basis for describing religion, formal learning, artistic traditions or trade networks specific to Ireland. Such subjects belong in a year-by-year framework only when evidence exists; here, silence is more truthful than invented detail.

If people did visit Castlepook’s landscape, they were almost certainly mobile hunter-gatherers whose immediate concerns included finding animal resources, fuel, stone, shelter and safe routes through a hazardous environment. Inferences of this kind come from Upper Palaeolithic lifeways elsewhere in Europe, not from a demonstrated Irish camp. They should therefore be understood as context, not as direct evidence that a particular group hunted, camped or exchanged goods in Cork.

Even access to Ireland remains uncertain. Lower global sea levels altered coastlines and exposed areas now beneath the Irish and Celtic seas, but this does not automatically prove a simple, continuous land bridge or an easy journey from Britain or continental Europe. Ice margins, rivers, tidal channels,

seasonal sea ice and rapidly changing coastlines would all have affected movement. The routes by which animals, and perhaps people, reached the island remain a question for geological, palaeoenvironmental and archaeological research.

The Landscape Before the Great Advance

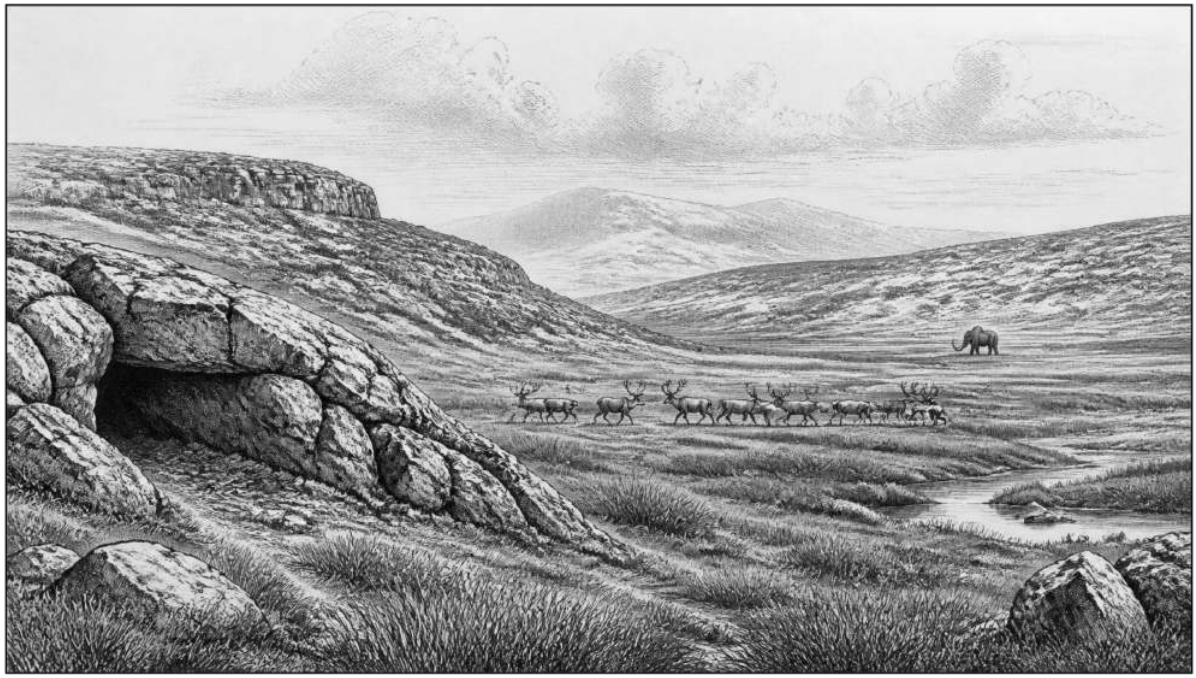
The chief development around this notional date was environmental rather than political: Ireland stood within a narrowing window before major ice-sheet growth reshaped much of the island. Later glaciation would scour rock, redeposit sediment and remove many traces of earlier landscapes and visits. That destructive history helps explain why a single reindeer femur can carry such weight. It is not because the bone tells a complete story, but because so little of this period has survived.

For Ireland, c. 31,220 BCE is therefore best understood as an episode of possibility. Cold-adapted fauna ranged through at least parts of the island; caves in the south preserve fragments of that ecological world; and Castlepook offers a contested but potentially transformative trace of human carcass processing. It does not yield a village, a tribe or an event. It reveals instead a precarious Atlantic landscape, inhabited surely by animals and perhaps visited fleetingly by people, shortly before expanding ice made both preservation and survival far more difficult.

Chapter 082 of 100

31219 BCE

Mammoth Cave’s Lone Incision [82]



A Date Beyond the Calendar

31,219 BCE is a modern chronological label, not a year that anybody in Ireland could have named, recorded or remembered. No calendar, settlement sequence or event horizon can be resolved to that precision in the Late Pleistocene. In simple calendar arithmetic, it lies about 33,170 years before AD 1950, conventionally expressed as c. 33.2 thousand calibrated years BP. That conversion should not be mistaken for a radiocarbon measurement. At this depth of time, radiocarbon results require calibration and normally produce probability ranges rather than a single calendar year.

The responsible setting is therefore broad: later Marine Isotope Stage 3, a climatically unstable part of the last Ice Age, before the fullest expansion of the last British–Irish Ice Sheet. For Ireland, the evidence closest to this notional date is not a house, grave, hearth or tool-making floor. It is an uneven archive of animal bones, cave sediments, geological deposits and old museum collections. These can show that large mammals entered and at times lived on the island; they can suggest the character of certain habitats; and one bone has raised the possibility of human activity. They cannot supply a narrative of a particular Irish community in a particular year.

Castlepook’s Long Bone Archive

The key place is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. It is a maze-like limestone cave system above the Awbeg valley. Excavations conducted mainly between 1904 and 1918 recovered a remarkable assemblage, much of which entered the National Museum of

Ireland. Later dating programmes and reassessments have made Castlepook the island’s richest known vertebrate archive for the period before the Last Glacial Maximum.

The cave does not represent one neatly sealed episode. It collected remains over a long interval. Water movement, collapse, frost, scavengers and early excavation all complicated its deposits, while the standards of recording used in the early twentieth century were far removed from modern field practice. Geological Survey Ireland summarises the dated span of individual Castlepook bones as roughly 45,700 to 19,950 radiocarbon years BP. That breadth is vital: a bone from the cave is evidence for an animal, and sometimes for the processes that brought it underground, but not automatically for every other animal or activity in the collection.

Recent redating has made the caution sharper rather than less important. Improved preparation of bone collagen showed that several formerly obtained dates from southern Irish caves were too young, in some cases by thousands of radiocarbon years. The revised results place parts of the Castlepook fauna firmly within Marine Isotope Stage 3 and indicate that animals such as giant deer and spotted hyaena may have disappeared locally before the climatic severity of the Last Glacial Maximum. The lesson is not that all uncertainty has vanished, but that museum specimens and old cave collections can still materially change Ireland’s deep history.

A Tundra-Edge Fauna

Castlepook’s fauna evokes an Ireland radically unlike the wooded island of later prehistory. Woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, collared and Norwegian lemmings, and spotted hyaena are among the animals identified from the cave. The combination points to open, cold environments at least during the periods represented by the relevant remains: landscapes in which herb-rich grasslands, sedges, low shrubs and exposed ground could sustain grazing and browsing mammals, alongside predators and scavengers.

Yet it would be unsafe to turn that list into a photographic reconstruction of the whole island in 31,219 BCE. Animals have different ranges, cave deposits mix time, and Ireland’s terrain produced local variation. Some lowlands may have offered sheltered feeding grounds while uplands and northern districts were harsher; rivers, seasonal snow cover and sea level altered routes and habitats. The cave assemblage demonstrates that suitable environments existed in Ireland at intervals. It does not prove that mammoths, reindeer, hyaenas and every other listed species stood together beside the Awbeg on one day.

Sea level was substantially lower than today during the wider glacial period, changing the outlines of coasts and enlarging adjoining shelves. Ireland’s relationship with Britain and the continental landmass was also unlike the modern island geography, but the exact routes available to animals or people at this particular moment remain uncertain. The presence of terrestrial mammals proves that dispersal occurred during the Pleistocene. It does not identify a single crossing point, a continuous land bridge, or a route used by a human group.

The Reindeer Femur

One fragment of reindeer femur gives this period an exceptional, if highly qualified, place in Irish archaeology. County Cork heritage publications present the bone as dating to about 31,000 BC and describe a deep mark on it as having been made by a sharp stone implement while the carcass was fresh.

Zooarchaeologist Ruth Carden's interpretation is that it may record butchery. If correct, it would be evidence that people used a cutting edge on a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the island's well-established post-glacial settlement record.

The inference must remain narrower than the popular headline. The date applies to the animal bone, not directly to the incision. The fragment came from an old collection, rather than from a modern excavation of an intact occupation surface that held stone tools, hearths, food waste and the marked bone together. Marks on bone can be difficult to distinguish from carnivore damage, sediment abrasion, breakage or damage caused during recovery. Nor does a single modified limb bone reveal whether people killed the reindeer, found a carcass, took meat or sinew from it, or processed it elsewhere before scavengers or water carried part of it into the cave.

Accordingly, the reindeer femur is best described as possible evidence of a brief human visit or activity episode, not proof of permanent settlement. There is no securely associated dwelling, burial, lithic assemblage, hearth, art object or stratified campsite in Ireland of this age. The National Museum of Ireland continues to state that clear evidence for a Palaeolithic human presence has not yet emerged. That institutional caution is compatible with taking the Castlepook mark seriously: it recognises both the object's potential importance and the need for independently excavated corroboration.

People, If Present

If the incision was made with a stone tool, the smallest defensible conclusion is economic rather than political: one or more people had access to a sharp lithic edge and to a reindeer carcass. Reindeer could supply meat, marrow, fat, hide, sinew, bone and antler. Mobile Upper Palaeolithic communities elsewhere in north-west Europe possessed the knowledge to hunt large game, make varied stone tools, maintain clothing and shelters, and organise seasonal movement. Those continental comparisons indicate what was possible, but they cannot be converted into facts about an Irish camp for which no camp has been found.

Nothing in the Irish evidence permits named peoples, a language, a leader, kin group, territory, religion or diplomatic relationship to be identified. There is no basis for describing tribal politics, warfare, ritual or exchange networks in Ireland at this date. Likewise, it would be unwarranted to claim regular trade across the sea merely because animals or perhaps people reached the island. A possible butchery mark is a remarkable trace, but it is not a constitution, a map of allegiance or a record of belief.

Everyday life is similarly elusive. A visiting party may have known fire, hide-working, food preservation and the practical skills familiar to Upper Palaeolithic hunter-gatherers elsewhere, but Castlepook does not demonstrate any of these practices in Ireland. It cannot establish population size, sex and age composition, length of stay or whether visitors returned. The strongest historical achievement is to preserve the distinction between what a wider European analogy makes plausible and what an Irish find actually attests.

Before the Great Expansion of Ice

31,219 BCE also predates the best-established maximum of the last British–Irish Ice Sheet. Large-scale reconstructions describe sustained ice-sheet growth from about 31,000 years BP to 26,000 years BP, with maximum overall extent later, around 26,000 years BP, and maximum ice volume around 23,000 years BP. These are ranges and modelled reconstructions, not a claim that all parts of Ireland changed at once. Ice accumulated, advanced and responded differently in different sectors.

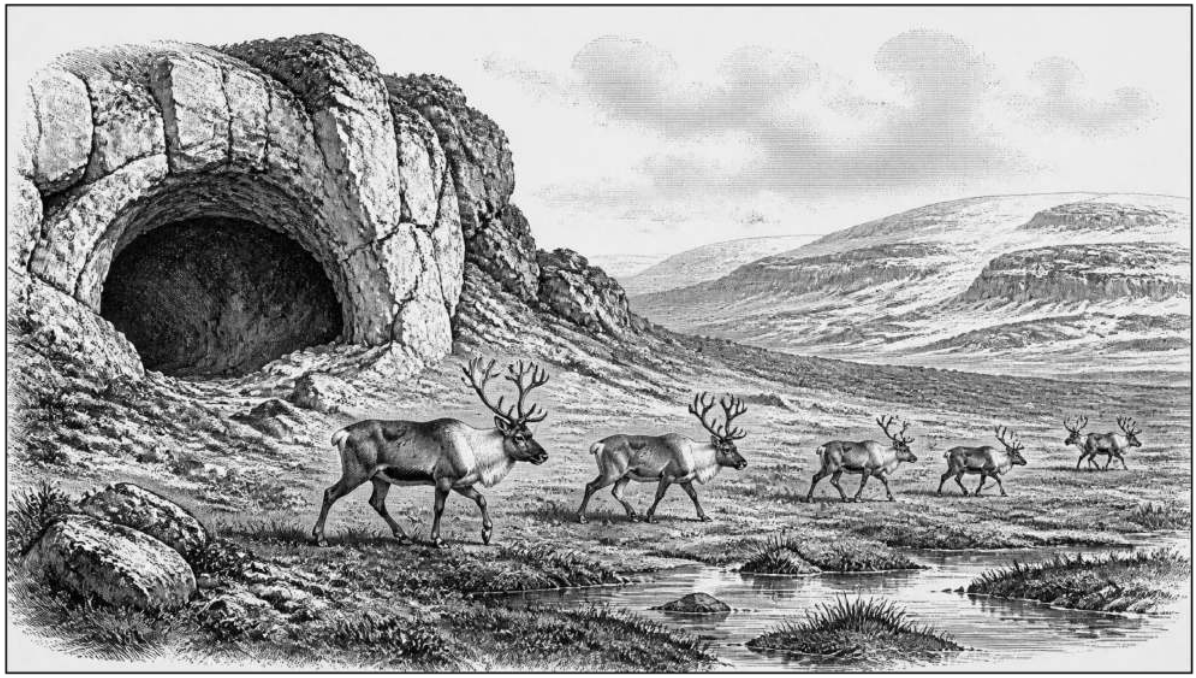
The target date, c. 33.2 thousand calendar years BP, should therefore not be pictured simply as Ireland buried beneath the maximum ice sheet that later scoured much of the landscape. The faunal evidence itself indicates that at least some Irish environments had supported substantial mammals in the preceding millennia. But subsequent glaciation was historically decisive: it reshaped terrain, displaced or extinguished local faunas, buried and eroded deposits, and likely destroyed much of the fragile evidence that brief human visits might have left.

For this reason, 31,219 BCE is best understood not as a lost year of Irish political history but as a threshold in the island’s recoverable environmental past. Castlepook shows that Ice-Age Ireland could be part of a wider north-west European world of reindeer, mammoths and large carnivores. Its lone marked femur raises the possibility that people entered that world too. The evidence is too slight to populate the landscape with certainty, yet too significant to ignore. In deep prehistory, intellectual honesty lies in allowing both statements to stand together.

Chapter 083 of 100

31218 BCE

The Castlepook Chop Mark [83]



31,218 BCE is not a year that can be recovered from the Irish archaeological record in the ordinary historical sense. No event, settlement, ruler or journey can be assigned to it, and modern calendar-year precision is unavailable at this depth of time. As a piece of calendar arithmetic, it falls roughly 33,167 years before AD 1950, the reference point used for "before present" (BP), but that conversion is not a scientific date for an occurrence in Ireland. Radiocarbon ages must be calibrated, and at this age their ranges commonly span centuries or more. The responsible subject is therefore Ireland in the later part of the last Ice Age: a changing Late Pleistocene landscape, broadly within Marine Isotope Stage 3, represented by scattered animal bones, cave sediments, wetland deposits and glacial landforms.

A Landscape Before the Maximum

This was before the clearest, best-dated maximum of the last British–Irish Ice Sheet, generally placed around 27,000–23,000 calibrated years BP, although ice grew and retreated unevenly across the islands. It would be misleading to picture a single, stable Ireland at 31,218 BCE. Research on the British–Irish Ice Sheet shows a complex history in which ice masses, sea level, coastlines and climates altered markedly through Marine Isotope Stages 4 and 3. Some parts of Ireland may have supported substantial ice at earlier moments; other areas were exposed during colder but non-glacial intervals. The evidence does not allow a map of the island for this particular nominal year.

What is clear is that Ireland was part of a northern Atlantic world subject to abrupt climatic shifts. It was not the later, familiar green island of woodland, farms and bogs. In suitable ice-free areas, open vegetation could develop: grasses, sedges, herbs, mosses and low shrubs rather than closed forest. Winters were severe, growing seasons short, and wind, frost and seasonal waterlogging mattered greatly. Yet "Ice

Age” should not be equated automatically with uniform, lifeless ice. The surviving geological and biological evidence instead points to a patchwork of ice margins, exposed ground, shallow pools, wet hollows, river channels and open grazing land, changing over long periods.

Fermanagh’s Buried Wetland

The most illuminating environmental evidence comes from deposits at Derryvree near Maguiresbridge in County Fermanagh. There, organic silts and moss-rich sediments were preserved between bodies of glacial till. Their position is important: they record an interval when a wetland existed between episodes of ice-related deposition, rather than a landscape that can be assumed to represent all Ireland at once. A radiocarbon determination historically associated with the deposits is about 30,500 radiocarbon years BP. Calibration and later revisions to Irish glacial chronologies mean that it should not be treated as an exact match for 31,218 BCE. It nevertheless provides a closely relevant window into the kind of cold-stage environment that could occur in Ireland during this broad era.

Plant macrofossils, pollen and insects from such deposits have been interpreted as evidence for treeless, tundra-like muskeg: a waterlogged mosaic with sedges, mosses, open pools and sparse cold-tolerant plants, including taxa such as bogbean and mountain-avens in the wider Fermanagh record. Insects and mosses are particularly valuable because they can reveal conditions underrepresented by larger fossils. The interpretation is not that every Irish valley was a clone of Derryvree. Rather, the site demonstrates that, during a cold interval bracketed by glacial deposits, life persisted in wet, open habitats. These deposits also show why environmental history is central to this period: vegetation and hydrology, not written testimony, provide the closest thing to a contemporary account.

The Cave at Castlepook

For southern Ireland, Castlepook Cave near Doneraile, County Cork, is indispensable. Also known as Mammoth Cave, it produced a remarkable assemblage during excavations in the early twentieth century. The National Museum of Ireland preserves material from the cave, including spotted hyaena remains. Across its passages and collections, researchers have identified bones of mammoth, reindeer, giant deer, brown bear, wolf, fox, mountain hare, Arctic fox, lemmings and spotted hyaena. This is compelling proof that parts of Ireland were available to a varied cold-stage fauna during portions of the Late Pleistocene.

It is not, however, a census taken in one season. Cave deposits are difficult archives. Carnivores may drag in prey or scavenged bones; water can move sediment; bones from different periods can become mixed; and the earliest excavations lacked the stratigraphic methods expected today. Direct dating has improved the picture but also demonstrated its complications. A reassessment of several Castlepook specimens using improved sample preparation found dates substantially older than some earlier results. It suggested that spotted hyaena and giant deer may have disappeared locally before about 40,000 calibrated years BP. Thus, the long faunal list should not be used to place mammoths, hyaenas, reindeer and giant deer together on a single morning in 31,218 BCE.

Even so, the cave gives this period a vivid ecological frame. Reindeer imply extensive seasonal grazing landscapes; lemmings and Arctic fox signal cold conditions; mammoth and giant deer indicate that, at relevant times, the island could sustain large herbivores; hyaenas and wolves demonstrate predator and scavenger guilds. The animals would have occupied a landscape connected, intermittently and in ways still debated, with western Britain and continental north-west Europe. Lower sea levels and

changing ice margins altered those connections. Fossils show that animals reached Ireland; they do not by themselves settle whether every movement used dry land, sea ice, short crossings, or routes available only at particular stages.

A Reindeer Bone and a Human Question

The closest possible evidence for people in this broad period is a fragment of reindeer femur from Castlepook. Publicly reported research dates the bone to about 33,000 years ago and identifies a deep mark as consistent with cutting or chopping fresh bone with a sharp stone tool. If that interpretation is sustained, the mark is evidence that humans processed a reindeer in Ireland far earlier than the previously recognised terminal-Pleistocene evidence. It would be exceptionally important: a small physical trace of an encounter between people, animal and landscape at the edge of north-western Europe.

The distinction between evidence and interpretation is essential. The dated object is an animal bone, not a human skeleton, hearth, stone-tool assemblage or house floor. The proposed tool mark is a strong and plausible zooarchaeological observation, but Castlepook is an old and disturbed cave collection rather than a modernly excavated, sealed camp. The bone cannot tell us how many people were present, their language, sex, age, origin, technology beyond the possible use of a sharp implement, or whether they returned. Nor does it securely identify a cultural tradition. Although Upper Palaeolithic groups lived elsewhere in Europe at this time, assigning a Gravettian or any other label to Ireland without diagnostic artefacts would go beyond the evidence.

The modest claim is also the significant one: people may have reached and exploited Ireland during this cold-stage interval. This need not mean permanent occupation. A small, mobile party could have arrived during a window of environmental opportunity, followed animals, used a cave or its vicinity briefly, and left almost no durable trace. Subsequent glaciation, erosion, rising seas and the scarcity of systematic cave investigation all reduce the odds of recovery. The absence of known dwellings or tools is therefore not proof of absence, but neither does the marked femur justify a detailed story of an established Irish population.

Life Without a Chronicle

There is no responsible basis for discussing political affairs, diplomacy, law, named communities or warfare in Ireland at this date. There are no monuments, burials, villages or weapon assemblages from which to reconstruct authority or conflict. Similarly, religion, art, formal learning and language remain invisible. Caves should not automatically be called ritual sites merely because bones were found in them: at Castlepook, carnivore activity and natural deposition are major parts of the explanation.

Economy can be discussed only at the narrowest level. If the Castlepook mark was made by people, it indicates carcass processing: the removal of meat, marrow or other useful tissues from a reindeer limb. That is evidence of subsistence behaviour, not of farming, property, markets or trade. There is no basis for claiming exchange networks in Ireland itself. Reindeer, mammoth and other animal remains demonstrate resources in the landscape, while the cave record hints at the hazards of sharing it with large carnivores. Any human life here would have depended on mobility, detailed environmental knowledge, shelter, fire and perishable equipment, but those practical necessities are general inferences from Palaeolithic lifeways, not objects recovered from a securely dated Irish campsite.

Settlement, therefore, is best described as unproven. The Irish evidence around this time consists chiefly of fossils and sediments, not settled places. The most meaningful regional contrast is between Fermanagh's preserved wetland archive and Cork's limestone cave archive: one records plants, insects and waterlogged ground, the other a time-averaged animal assemblage shaped partly by carnivores. Together they overturn an older image of an entirely empty Ireland before the Last Glacial Maximum. They do not produce an annual narrative.

What This Date Can Mean

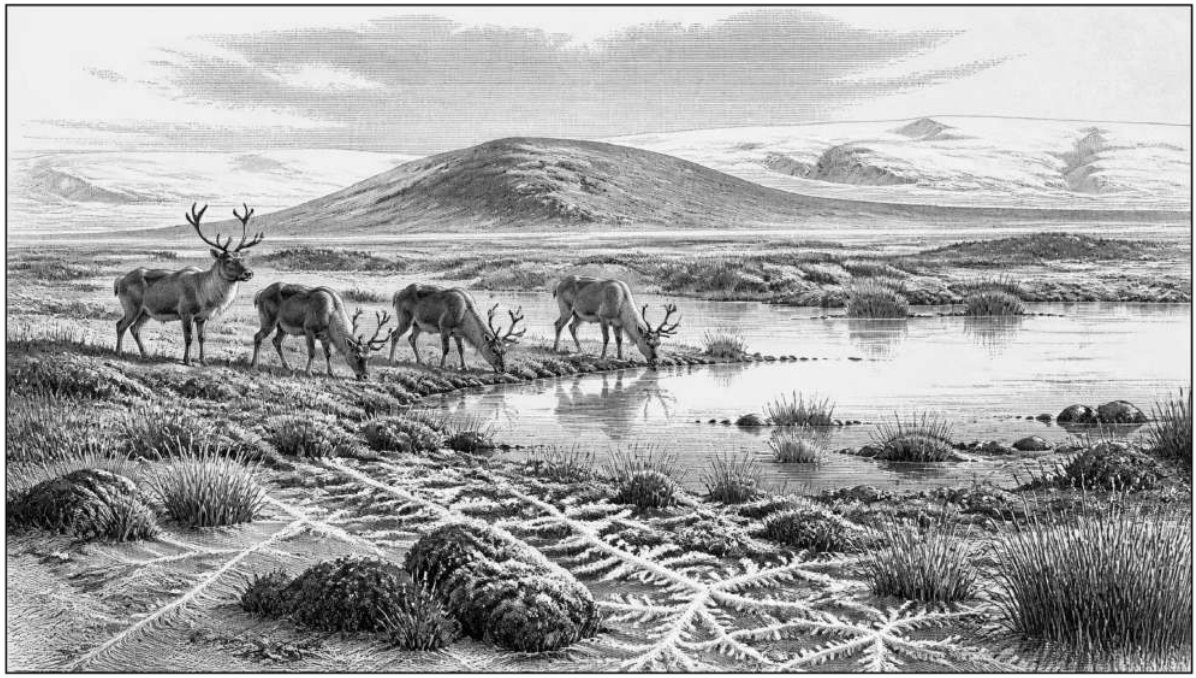
31,218 BCE is best used as a waypoint, not an anniversary. Around this point in the long Late Pleistocene, Ireland was environmentally dynamic and at times biologically connected to neighbouring lands. Cold-open habitats supported specialised plants and animals; wetland pockets formed during intervals between glacial advances; and Castlepook preserves evidence for a rich, if chronologically mixed, fauna. The reindeer femur offers a tantalising possible sign of human butchery, but it must remain a carefully bounded conclusion until corroborated by further securely excavated evidence.

The period's real historical importance lies in that balance of discovery and restraint. Ireland was neither a timeless ice sheet nor a populated country awaiting later written history. It was a changing frontier of ice, water, open ground, animals and perhaps brief human visits. Its record survives only in fragments, and the fragments demand that archaeological uncertainty be treated not as a failure of history, but as part of the history itself.

Chapter 084 of 100

31217 BCE

Elephant Hall’s Long Winter [84]



31,217 BCE is not a recoverable Irish calendar year. It is a modern label applied to a point about 33,166 years before AD 1950, the reference date used by archaeologists for “before present” (BP). No Irish written record, annual deposit or securely dated human action can be assigned to this particular year. Radiocarbon measurements of this antiquity require calibration because atmospheric carbon-14 varied over time; the resulting calendar estimates generally span centuries or millennia. The responsible history of this date is therefore a history of ranges, deposits and probabilities, not an anniversary with named people or events.

A Late Pleistocene Horizon

The notional date belongs to the Late Pleistocene, in the latter part of Marine Isotope Stage 3 (MIS 3), a climatically unstable portion of the last Ice Age. It came before the fullest expansion of the last British–Irish Ice Sheet, rather than during the better-known glacial maximum. This distinction matters. Ireland was not simply a uniform, permanent ice sheet throughout the whole Ice Age, nor was it anything like the temperate, wooded island of later prehistory. Ice centres and margins expanded and contracted unevenly, while cold, open environments could persist beyond or between them. The most comprehensive recent reconstruction begins at about 31,000 years BP because evidence before that threshold is sparse; it depicts ice building across Ireland and Britain from roughly 31,000 to 26,000 BP and reaching a reconstructed maximum volume around 23,000 BP.

That wider chronology should not be converted into a confident map for one calendar year. At roughly 33,000 calendar years BP, Ireland was entering a phase of increasingly extensive glaciation, but the island’s local conditions varied greatly. Later ice repeatedly eroded, buried and rearranged older ground

surfaces, leaving a fragmentary record. A surviving wetland deposit or cave bone can demonstrate that a particular habitat or animal existed during part of a broad interval; it cannot establish that all regions shared that condition, still less that the evidence records 31,217 BCE itself.

Derryvree Beneath the Drumlin

The strongest Irish environmental evidence relevant to this horizon comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic deposits caught between two beds of till: unsorted sediment laid down by glacier ice. The stratigraphic sequence is unusually eloquent. An earlier glacier had deposited the lower till; a period without ice over the site then allowed water, sediment and living material to accumulate; a later glacial advance covered the deposit with upper till. The later ice helped create the drumlin landscape but also sealed a small archive of the preceding environment.

The Derryvree organic material produced the radiocarbon determination BIRM-166, conventionally reported as 30,500 radiocarbon years BP with a substantial uncertainty. Subsequent calibrated discussion places the relevant interval broadly at about 36,900–31,700 cal BP. The modern label 31,217 BCE lies within that span, but this overlap must not be mistaken for annual precision. The bed accumulated over time, and its calibrated range is itself broad. What it securely indicates is that, during part of later MIS 3, north-central Ireland contained an ice-free freshwater and periglacial landscape before later ice returned.

Plant, moss, insect and sediment evidence from Derryvree points to cold, open and wet conditions: a treeless, tundra-like or muskeg environment with shallow water, sedges, herbs, low shrubs and moss-rich ground. This was not necessarily a featureless white wilderness. Short growing seasons could still support vigorous summer plant growth around pools and saturated channels, providing habitats for insects and grazing animals. Yet frost, seasonal freezing and exposed winds placed strong limits on vegetation. The important conclusion is environmental, not scenic: parts of Ireland could sustain freshwater ecosystems in this wider period, even while the overall climate was severe and vulnerable to abrupt change.

Castlepook’s Animal Archive

County Cork supplies a different kind of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile, is Ireland’s richest known cave archive for vertebrate remains dating towards the Last Glacial Maximum. Excavations undertaken principally between 1904 and 1918 recovered more than 2,000 bones. Direct dates from individual remains extend across a long and discontinuous span, approximately 45,700 to 19,950 BP. The cave was a repository rather than a neatly preserved occupation floor: water movement, carnivore activity and early excavation methods all complicate its deposits. Its material must therefore be read as a time-depth assemblage, not as a photograph of a single Ice Age community.

The fauna nevertheless makes the broader landscape vivid. Castlepook has produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These animals did not all necessarily occupy the same locality or moment, but together they show that Ireland was connected to wider north-west European ecological systems during favourable phases of the Late Pleistocene. Carnivores matter especially. The cave probably served at times as a den or scavenging place, and hyaenas or other predators could have carried bones inside. Thus a bone from a cave may document the landscape beyond its entrance, while saying little about what took place in the chamber where it was found.

The Reindeer and the Human Question

A reindeer femur from Castlepook has made this period especially significant for Irish human history. County Cork's heritage publication dates it broadly to about 31,000 BC and describes a deep mark interpreted by palaeozoologist Ruth Carden as having been made by a sharp stone tool while a reindeer carcass was processed. If that interpretation is confirmed, it is potentially Ireland's earliest evidence for human activity, vastly older than the securely established post-glacial settlement record. It suggests an encounter between people and a carcass, perhaps connected with hunting or butchery, in an Upper Palaeolithic north-west European setting.

But the limits of the find are as important as its promise. The femur's date concerns the age of the animal bone, not an exact moment of cutting. No associated hearth, stone-tool assemblage, dwelling, burial, food store or undisturbed butchery floor has yet been identified at Castlepook for this period. Nor does a possible tool mark demonstrate permanent occupation, a population, a language, ancestry or a route taken to the island. Recent work on Irish cave deposits has also shown how essential taphonomic analysis and modern redating are: antiquarian collections can contain mixed or redeposited material, and older radiocarbon determinations may require revision. The bone is best treated as an important claim requiring continued testing, not as proof of an established Irish hunting society.

No Polities, No Proven Religion

There is no evidence for political affairs, diplomacy, chiefs, territorial states or organised conflict in Ireland at this date. There are likewise no Irish structures, monuments, artworks, burials or ritual deposits that can responsibly be attributed to 31,217 BCE. Religion and learning leave no identifiable trace. It would be misleading to import later Mesolithic, Neolithic or medieval ideas of community and belief into a period separated from them by tens of millennia. The absence of evidence is not proof that people had no social lives or beliefs; it means that the Irish record cannot describe them.

If people did reach Ireland during this wider interval, comparative Upper Palaeolithic evidence elsewhere in Europe makes small, mobile groups following seasonal resources a reasonable possibility, not a demonstrated Irish fact. A reindeer carcass could provide meat, fat, hide, sinew and bone, but Castlepook does not reveal who processed it, whether the animal was hunted locally, or whether its remains were later dragged into the cave by carnivores. "Economy" at this scale means access to animal and plant resources, rather than farms, markets or trade networks. No evidence supports claims for agriculture, pottery, metalworking, long-distance exchange or a settled village in Ireland at this time.

An Island in Regional Change

Lower global sea levels altered coastlines around Ireland and Britain, exposing parts of continental shelf now underwater. Yet lower seas alone do not prove a walkable route from continental Europe to Ireland, and the precise configuration of ice, sea and traversable land changed through time. The appropriate picture is not an isolated modern island nor a confidently reconstructed land bridge, but a shifting Atlantic-edge region. Animals evidently reached Ireland during suitable intervals; how each species moved, and whether people could have followed the same routes, remains a separate question.

The most important development around this notional year was therefore not a human event but an environmental transition. Derryvree records a cold freshwater landscape between glacial episodes; Castlepook records the presence, over a long span, of animals adapted to the Ice Age world; and one

marked reindeer femur raises the possibility of a fleeting human action. Together they replace older caricatures of an entirely ice-bound or wholly empty Ireland. They do not yield a year-by-year narrative. For 31,217 BCE, the historical discipline lies in allowing the evidence to remain what it is: rare, local, powerful and unresolved.

Chapter 085 of 100

31216 BCE

Derryvree’s Hidden Sedge Marsh [85]



The label 31,216 BCE is useful to a modern chronology, but it must not imply an event recorded to that year. No calendar-year precision is available for Ireland this far into the Pleistocene. The most relevant evidence consists of deposits and animal remains dated across broad ranges. A Bayesian reconstruction places the Derryvree organic horizon near Maguiresbridge, County Fermanagh, at about 33.5 ± 1.2 thousand calibrated years before present: a range that encompasses this notional year, rather than pinpointing it. Ireland around this time belonged to the Middle Midlandian part of the last glacial cycle, conventionally correlated with Marine Isotope Stage 3. It was a changing cold-world landscape, not a named historical age with rulers, towns or chronicles.

A Date Within a Range

That distinction is fundamental. Radiocarbon years are not calendar years, because atmospheric carbon-14 has varied through time; very old results also carry substantial laboratory and calibration uncertainty. Derryvree’s famous determination, BIRM-166, was reported as 30,500 ± 1,100 radiocarbon years BP. Modern modelling treats it as evidence for an ice-free or lightly glaciated interval in its locality around 33.5 thousand calendar years BP, not as a dated day, season or human generation. The requested year therefore belongs within an archaeological and environmental window. It cannot responsibly be made the anniversary of a migration, a hunt or a climatic reversal.

The same caution applies to period names. Earlier Irish schemes termed this the Derryvree Cold Phase. That label remains useful as shorthand for a cold, open environment represented at Derryvree and linked, in older frameworks, with animal remains from Castlepook Cave in County Cork. Yet it does not mean that every part of Ireland experienced precisely the same weather, vegetation or ice cover at once.

The island’s relief, coastlines, proximity to ice masses and Atlantic weather systems made local conditions variable. The larger British–Irish Ice Sheet was developing unevenly during this long interval and would attain its greatest later extent, broadly between about 26,000 and 20,000 years ago.

Evidence Beneath a Drumlin

Derryvree is important because later ice so often eroded, redeposited or buried Ireland’s older Pleistocene landscapes. In a road cutting through a drumlin near Maguiresbridge, investigators found freshwater silts, fine sands and organic sediments sandwiched between two tills: unsorted debris deposited by glacier ice. The sequence establishes a simple but powerful order of events. Ice had affected the district; afterwards, water and vegetation accumulated sediment in a non-glacial setting; later ice sealed that former landscape beneath another till. The locality is not a settlement site, but it is a rare environmental archive from close to 31,216 BCE.

Its plant and insect remains indicate treeless tundra or muskeg: waterlogged ground with sedges, grasses, mosses and shallow pools, rather than woodland or peat bog in the modern Irish sense. Fossils include bogbean, lesser clubmoss and mountain-avens, plants able to survive exposed, cold conditions. Juniper and a variety of herbs are also represented in the wider reconstruction. Insects support the picture of wet, organic-rich ground and pools fringed by moss. This was not a featureless sheet of snow. During a suitable season, low plants, sedge margins and standing water created a patchwork of forage and shelter at ground level; in winter, however, the climate was severe.

The evidence describes a local habitat, not the whole island. It is nevertheless reasonable to infer a broadly open Irish landscape in many exposed areas, with far less tree cover than later Holocene Ireland. Permafrost-related processes, frost action, seasonal thaw and shifting drainage would have been central facts of life for plants and animals. The familiar patchwork of enclosed fields, hedges, deep peatlands and broad deciduous woods lay tens of millennia in the future. Many of the soils, gravels and landforms that shape modern Ireland would, however, be profoundly altered by the ice advances still to come.

Castlepook’s Animal World

In southern Ireland, Castlepook Cave near Doneraile, County Cork, offers the richest known Irish assemblage of vertebrates from this broad pre-Last Glacial Maximum world. Its cave deposits and historic collections have produced remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain or Arctic hare, stoat, collared lemming, Norwegian lemming and spotted hyaena. Not every specimen need be exactly contemporary, and the cave’s early excavation history complicates reconstruction. Nevertheless, the assemblage demonstrates that Ireland could support a strikingly varied cold-stage fauna during parts of Marine Isotope Stage 3.

That fauna helps give Derryvree’s sedge marsh a living scale. Reindeer and giant deer could have used open vegetation and wetland edges; lemmings and hares belong to cold-adapted communities; wolves, bears and hyaenas reveal a food web with large carnivores and scavengers. Yet no one should turn this list into a painted panorama for a single day in 31,216 BCE. Animal bones accumulated over time, sometimes through carnivore activity, natural deaths and movement within caves. Their presence proves that species reached Ireland during the relevant broad period; it does not map an exact herd route or establish their numbers in a particular valley.

Caves themselves were not necessarily human homes. At Castlepook, hyaena remains and other carnivore evidence make clear that animals could use underground spaces, drag in food and alter bones. A cave collection is therefore an archive of ecological processes as much as a record of any one creature's occupation. That is why modern re-dating, taphonomic study and carefully controlled excavation matter so greatly. They separate the securely observed—bone, species, surface mark, sedimentary context and laboratory age—from larger stories that remain possible but unproven.

The Human Question

The human question is the most arresting and the least settled aspect of this date. A reindeer femur from Castlepook has been interpreted by zooarchaeologist Ruth Carden as bearing a deep mark made on fresh bone by a sharp stone implement, perhaps during carcass processing. Direct dating and reassessment of the southern Irish fauna have made a human presence around 33,000 years ago a serious possibility. If the interpretation is upheld, it would move evidence of human activity in Ireland dramatically earlier than the terminal-Pleistocene butchered brown-bear bone from Alice and Gwendoline Cave, County Clare.

But a single marked bone cannot demonstrate a permanent settlement, a population, or even a camp. There is no securely associated hearth, stone-tool assemblage, house floor, burial, repeated butchery area or occupation surface at Castlepook of this age. Moreover, the femur comes from an old cave collection rather than a recently excavated sealed context. The date establishes the age of the animal bone; microscopic and taphonomic assessment must establish whether its mark is truly a human tool trace and whether it was made at the animal's death. The responsible conclusion for 31,216 BCE is therefore conditional: people may have visited or processed an animal in Ireland during this broad period, but sustained human occupation has not been demonstrated.

No Polities, No Proven Camps

There is no evidence for political affairs, formal leadership, diplomacy, warfare, territorial states or named communities in Ireland at this time. It would be misleading to describe the movements of hyaenas, reindeer or ice as conflict between peoples. Nor is there evidence for trade, agriculture, herding, metalworking, pottery, monuments, writing or ritual practice. No recovered object permits a defensible account of religion, art, language, kinship rules or learning in Ireland around this date.

If people were present, their way of life may be compared only cautiously with Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe: small, mobile groups capable of travelling through cold seasonal landscapes and obtaining meat, hides, bone and antler from large animals. That comparison is interpretation, not Irish proof. The Castlepook femur would indicate an act of carcass processing, not a social system. It cannot tell us whether the person who made the mark was alone or accompanied, whether they hunted the reindeer or found it dead, where they came from, or whether they ever returned.

Routes Across a Changing World

Ireland's connection with neighbouring lands is equally uncertain. Lower global sea levels altered the Irish Sea basin, but lower water alone does not prove a walkable land bridge between Ireland and Britain. Geological work has challenged the older assumption of a dependable southern or central Irish Sea route, while allowing that changing islands, ice and sea conditions may have created complex northern

possibilities at other times. For this early interval, there is no excavated Irish route, boat, crossing place or continental settlement trail linking a human visitor to Castlepook. Any account of migration must remain hypothetical.

Regional contrast matters more than imagined frontiers. Derryvree in Fermanagh preserves a freshwater tundra wetland beneath later glacial deposits. Castlepook in Cork preserves an animal-rich limestone-cave archive. Aghnadarragh in County Antrim supplies a longer stratigraphic sequence showing that Irish environments had repeatedly shifted between ice, cold open ground and milder intervals. Together these places reveal an Ireland that was environmentally dynamic, ecologically connected to wider north-west European faunas at times, and repeatedly transformed by glaciation.

What Can Be Said

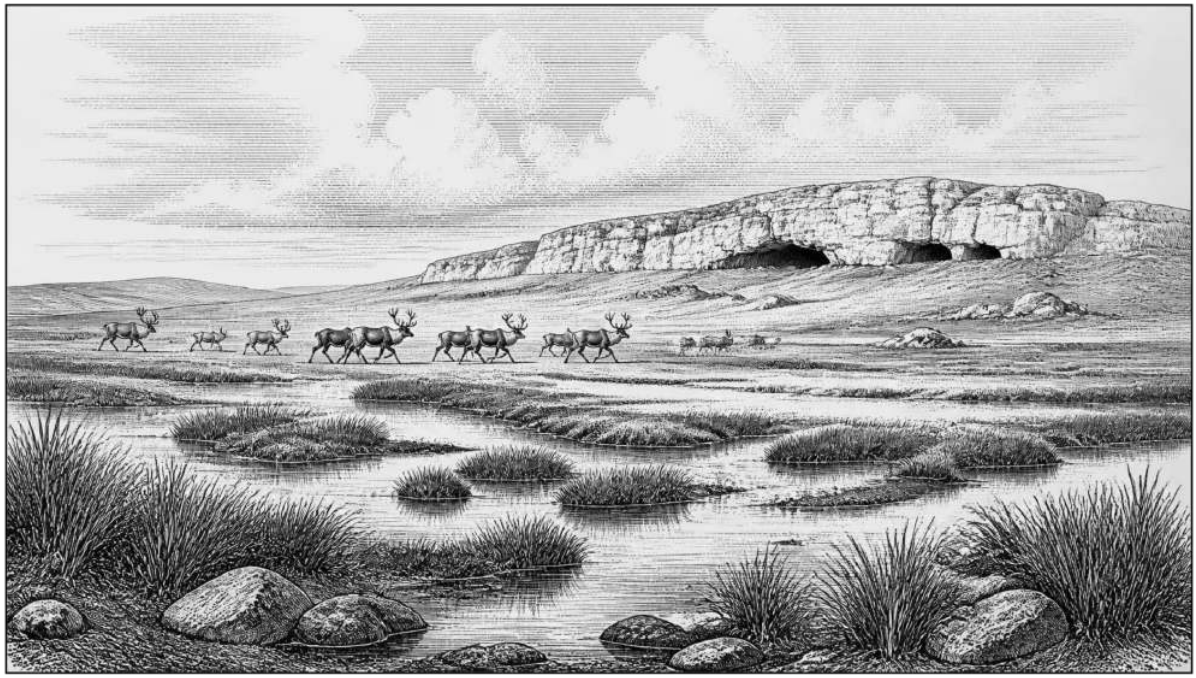
For 31,216 BCE, the strongest story is not of a king, battle or settlement but of evidence preserved against remarkable odds. Near Maguiresbridge, sedges, mosses, aquatic plants and insects recorded a cold wetland during an interval later hidden beneath ice-borne debris. In Cork, caves retained traces of mammoths, reindeer, hyaenas and other animals from the same broad cold-stage world. A single reindeer bone may preserve a human action, but the claim awaits the fuller corroboration that an extraordinary revision of Irish prehistory requires.

That restraint does not diminish the period. It places Ireland within the deep environmental history from which its later landscapes emerged. Around this point in the Late Pleistocene, the island was neither an empty stage awaiting history nor a place whose human past can be confidently narrated. It was a cold, open and unstable land, inhabited certainly by a distinctive animal community, documented locally by wetland sediments, and possibly touched by people whose presence remains one of Irish archaeology’s most important unresolved questions.

Chapter 086 of 100

31215 BCE

Castlepook’s Reindeer Traverse [86]



31,215 BCE is a modern calendar label, not a recoverable year in Irish prehistory. No person in Ireland recorded it, and no archaeological layer can responsibly be fixed to those twelve months. In terms used by Quaternary scientists, the point falls roughly 33,000 calendar years before present, within the later part of Marine Isotope Stage 3 (MIS 3), an unstable phase of the last Ice Age. The relevant evidence is dated in calibrated ranges, with uncertainties measured in centuries or millennia. It illuminates changing environments and the possibility of brief human activity, not an annual chronicle of events.

An Island of Intervals

The most important fact about Ireland at this depth of time is variability. MIS 3 was neither a single uniform freeze nor a straightforward approach to the Last Glacial Maximum. Temperatures, sea level, vegetation and ice margins shifted repeatedly across north-west Europe. The fullest expansion of the last British–Irish Ice Sheet came later, although ice was already growing rapidly in parts of the region. Recent reconstructions model a substantial combined British–Irish Ice Sheet by about 30,000 years ago, but they also emphasise that its margins differed from one sector to another and that reconstructions become less secure further back in time.

Therefore Ireland around this notional date should not be imagined as wholly buried beneath an unbroken ice cap, nor as a temperate green island resembling the modern one. Evidence points instead to a patchwork of ice, exposed ground, waterlogged hollows, bare mineral soils and open cold-country vegetation, changing over long periods. The coastlines were also unlike those of today because global sea levels were lower and the weight of growing ice altered the land. Yet no single map can tell us precisely whether a particular valley, cave entrance or route was open in 31,215 BCE.

Derryvree’s Buried Wetland

The clearest environmental evidence close to this broad horizon comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed fine sands, silts and organic deposits sealed between two distinct glacial tills. This freshwater series is valuable precisely because a later advance of ice covered and protected it. It demonstrates that, during an interval between glaciations, this part of the north of Ireland supported standing or slowly moving freshwater and living vegetation.

An organic sample from Derryvree produced a radiocarbon determination of 30,500 ± 1,100 radiocarbon years BP. Calibration has placed the deposit broadly within about 36,900–31,700 calibrated years BP: a wide range that includes the modernly numbered year in question but cannot pinpoint it. The deposit’s pollen was poorly preserved, but plant macrofossils, mosses and other biological remains indicated open tundra and periglacial conditions. Sedges and mosses grew where water gathered; aquatic plants occupied pools; sparse herbs persisted beyond them. Trees did not form a forested landscape. A few grains of pine or hazel pollen cannot be treated as proof of nearby woodland, since pollen can travel far and deposits can be disturbed.

This was not lifeless country. Insects, wetland plants and small animals could occupy sheltered, productive niches, while wider open ground supported grazing. But it was a demanding landscape, exposed to cold, short growing seasons and repeated environmental disruption. Derryvree tells us about a phase within a much longer interval, not necessarily the precise contemporary landscape of County Cork. Its great value lies in showing that parts of Ireland could retain ice-free, freshwater habitats before later ice remade the terrain.

Castlepook and the Mammal World

In north County Cork, Castlepook Cave near Doneraile provides the richest known Irish assemblage for the period leading towards the Last Glacial Maximum. Its galleries, including the dramatically named Hyenahall and Elephant Hall, accumulated bones over a very long span rather than preserving a single undisturbed occupation floor. More than 2,000 bones have been recovered, and direct dates from individual specimens range broadly from about 45,700 to 19,950 years BP. Water movement, old excavation methods and the activities of carnivores mean that associations within the cave must be treated carefully.

Even so, the faunal record is remarkable. It includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, alongside wolf, Arctic fox and lemmings in later Ice Age contexts. These animals establish that Ireland formed part of a wider north-west European cold-stage ecological world. Reindeer and mammoth imply extensive open habitats with substantial grazing resources; hyaenas and wolves remind us that large carcasses could be accumulated, moved and gnawed by predators and scavengers. A cave bone is not automatically evidence of a hunt, a camp or even an animal’s death immediately outside the entrance.

Re-dating has also changed the story. Improved laboratory pretreatment has shown that some older Irish cave radiocarbon determinations underestimated the true age of specimens by several thousand years. At Castlepook, revised results indicate that some mammals lived in Ireland during MIS 3 and that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. Such revisions are a warning against converting an old laboratory result too readily into a precise historical scene.

A Reindeer Bone and a Human Question

A reindeer femur fragment from Castlepook is especially important because a surface mark has been interpreted as a possible cut made while fresh tissue was removed with a sharp stone tool. Public discussion of the bone has connected it with human activity around 33,000 years ago. If that interpretation is sustained through detailed taphonomic study, it would be evidence that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland far earlier than the island’s previously accepted human record.

That conclusion must remain deliberately limited. Castlepook has not produced a securely associated stone-tool assemblage, hearth, dwelling floor, human bone, burial, artwork or repeated occupation horizon of this age. Nor does a possible butchery mark identify a language, ancestry, named cultural group or population size. It cannot demonstrate a permanent settlement. The National Museum of Ireland consequently still describes clear Palaeolithic evidence for humans in Ireland as lacking. The prudent position is that Castlepook offers a potentially consequential indication of a brief human visit or carcass-processing episode, while the case for sustained occupation at this time remains unproven.

Life, Movement and Limits of Inference

If people did reach Ireland during this interval, they would have been mobile hunter-gatherers operating within the wider Upper Palaeolithic world of north-west Europe. Processing a large animal would have required practical expertise: sharp stone edges, knowledge of anatomy, cooperation, clothing and shelter suited to severe weather, and an understanding of seasonal animal movement. Meat, marrow, hide, sinew and bone all had potential value. These are reasonable inferences from hunter-gatherer practice and the proposed cutmark, not direct observations of an Irish camp.

Nothing in the present evidence supports farming, livestock keeping, pottery, metalworking, monuments, villages or long-distance trade in the later prehistoric sense. Nor can archaeology identify political authorities, warfare, diplomacy, law, religious institutions or formal learning. The absence of evidence is not evidence that Ice Age people lacked social ties, beliefs, storytelling or technical knowledge; it means that no Irish material securely documents those matters for this date. A small travelling party could have possessed rich cultural traditions without leaving traces that survived glaciers, changing sea levels, cave disturbance and tens of millennia.

Settlement evidence is particularly fragile. Cold-stage groups may have used short-lived camps in places now submerged, eroded, buried beneath glacial sediments or never excavated. Castlepook’s cave deposits show that animals used the Cork landscape, and Derryvree shows that freshwater tundra habitats existed in Fermanagh during a broadly comparable period. They do not prove that either locality was continuously occupied by people, or that their records were exactly contemporary.

What Can Be Said Responsibly

Ireland around 31,215 BCE was a changing Ice Age landscape rather than a political country with a recoverable annual history. Across calibrated date ranges that encompass this point, cold open habitats and freshwater wetlands existed in at least some regions before the last ice sheet reached its greatest extent. Mammoths, reindeer, giant deer, bears, hyaenas and other animals entered or lived on the island at

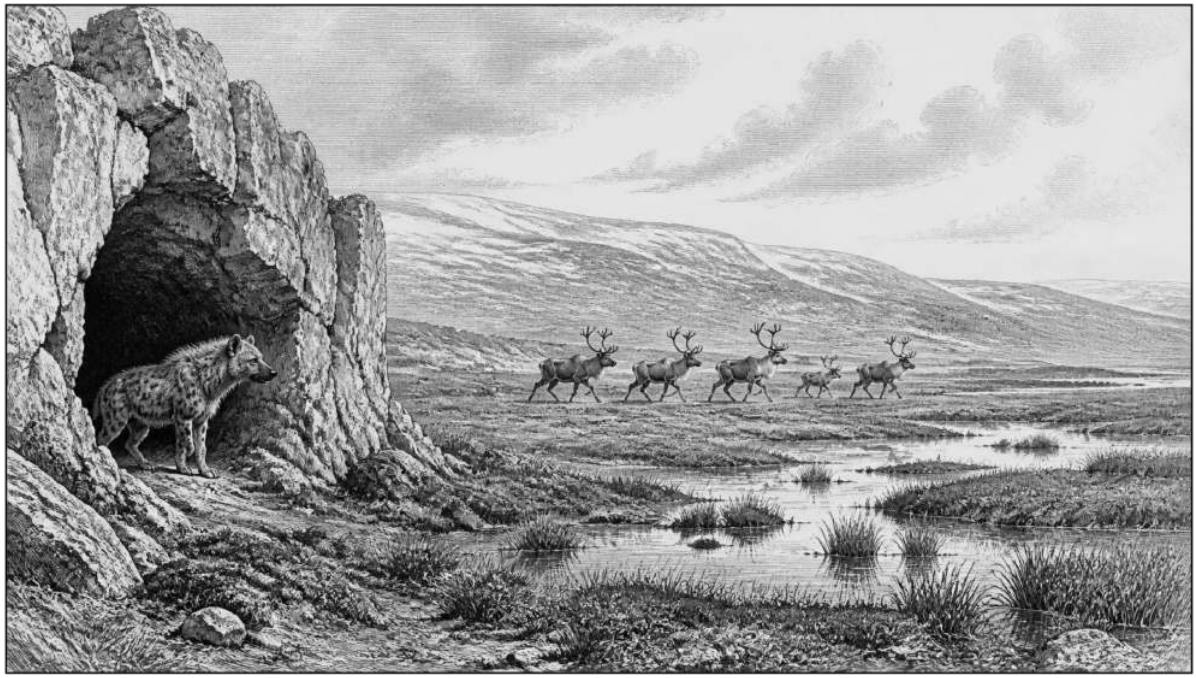
different times. At Castlepook, one marked reindeer bone raises the serious possibility of an Upper Palaeolithic human presence. At Derryvree, buried sediments preserve an ecological record of tundra wetland between episodes of glaciation.

Those two archives are more revealing than any invented event would be. They show an Ireland connected ecologically to Ice Age Europe, repeatedly transformed by climate and ice, and only tentatively visible through bones, pollen, plants, sediment and stone-marked surfaces. The history of this date is not yet a history of rulers or settlements. It is the deeper history of survival, movement and uncertainty at the edge of the archaeological record.

Chapter 087 of 100

31214 BCE

Castlepook’s Scavenger Cave [87]



A date written as 31,214 BCE is a modern chronological coordinate, not a year that anyone in Ireland could have named, recorded or experienced by a shared calendar. There are no written sources, annual events, rulers, communities or precisely datable human sites for this point in the Late Pleistocene. In simple arithmetic it lies about 33,164 years before AD 1950, the reference year used for “before present” dating, but that is not itself a calibrated archaeological date. The responsible question is therefore not what happened in Ireland in this exact year, but what the best evidence can say about the island and its inhabitants—animal and possibly human—during the broader climatic interval around it.

A Cold-Stage Ireland

About 31,214 BCE, Ireland was in Marine Isotope Stage 3, part of the last Ice Age. This was not a single, unchanging freeze. Northern Atlantic climates oscillated sharply between colder and relatively milder phases, while ice masses expanded and contracted over long timescales. The later Last Glacial Maximum, when the Irish Ice Sheet was at or near its greatest extent, lay in the future: commonly cited calibrated ranges place that maximum broadly between about 26,500 and 19,000 cal BP. Around the date considered here, substantial parts of Ireland could support terrestrial animals, although conditions were far colder, more open and more variable than those of the modern island.

That conclusion must not be turned into a uniform map. Evidence from caves in the south and south-east, and from buried deposits beneath drumlins in the north, records particular places at particular stages in a complex glacial history. It does not prove that every valley was habitable at once. Nor did the coastline resemble Ireland’s present shore. Lower global sea levels exposed continental shelves and

altered the Irish Sea basin, but a lower sea level alone does not demonstrate a simple, permanent pedestrian route between Ireland and Britain. Animal and possible human movement must be understood as a geographical problem still shaped by changing ice, water, coasts and seasons.

Derryvree’s Tundra Record

The clearest environmental evidence relevant to this broad period comes from Derryvree near Maguiresbridge, County Fermanagh. There, road works exposed a freshwater series of silts and fine sands trapped between two tills within a drumlin. Organic-rich layers produced a conventional radiocarbon determination of 30,500 +1,170/−1,030 BP. That is not an exact equivalent of 31,214 BCE, and it cannot date a single year; nevertheless, it places the deposit firmly within the middle part of the last cold stage and makes it an invaluable Irish comparison for the period.

Its plant and insect remains describe an open, periglacial landscape. Mosses, sedges and other herbaceous plants grew around freshwater, while the insect fauna had a distinctly northern, cold-adapted character. Fossils including bogbean, dwarf willow, mountain-avens and lesser clubmoss show that wet hollows and shallow water could sustain specialised vegetation even where dry ground was sparsely clothed. The important point is not that Ireland was a featureless snowfield. It was a mosaic: pools, sedge margins, wet ground, bare or thinly vegetated surfaces and open tundra-like terrain. Such places could offer forage and water, but their resources would have been seasonal and vulnerable to abrupt climatic deterioration.

Derryvree also demonstrates a larger geological truth. The organic bed lies between deposits left by ice. It records a period when this part of Fermanagh was not overridden by an ice sheet, yet it was later buried beneath renewed glacial activity. The survival of such a record is exceptional. Most evidence that may once have existed on exposed ground was eroded, reworked or sealed by later ice. Absence of camps, tools or hearths across much of Ireland is therefore meaningful but not straightforward: it reflects both the scarcity of people, if people were present, and the destructive power of subsequent glaciation.

The Cave Near Doneraile

Castlepook Cave, north of Doneraile in County Cork, is the crucial southern archive. Also known as Mammoth Cave, it is a limestone maze cave whose chambers acquired memorable excavation names, including Hyenahall and Elephant Hall. Excavations begun by Richard J. Ussher in 1904 and reported in 1918 recovered a remarkable animal assemblage. Later dating and reassessment have made Castlepook the richest known Irish site for vertebrate life in the run-up to the Last Glacial Maximum. Geological Survey Ireland reports more than 2,000 recovered bones and a long series of individual dates, spanning roughly 45,700 to 19,950 BP.

That impressive range is also a warning. Castlepook is an archive accumulated over many millennia, not a frozen instant. Mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are represented, but they need not all have occupied the surrounding country in the same generation, still less on the same day. Carnivores altered the assemblage as well. Spotted hyaenas could drag or scavenge carcass material into a den, break bones and leave them mixed with sediment. Water movement, cave collapse, nineteenth- and twentieth-century excavation methods, and later disturbance further complicate the original associations.

Even so, the fauna establishes that Ireland during suitable MIS 3 intervals supported much richer large-animal communities than later historical experience would suggest. Reindeer imply cold open grazing country; mammoths and giant deer indicate extensive plant resources; predators and scavengers show an ecosystem with carcasses and prey sufficient to sustain them. This was not modern pastoral Ireland without farms, hedges, forests or villages. It was a shifting Ice-Age landscape in which the availability of grass-like vegetation, browse, shelter and unfrozen water mattered more than permanent fields or fixed boundaries.

A Reindeer Bone and a Question

A reindeer femur from Castlepook gives the year unusual historical significance. County Cork heritage material presents it as dating to about 31,000 BCE and identifies a deep linear mark as having been made by a sharp stone tool while fresh bone was butchered. Ruth Carden's re-examination of old collections brought this specimen to wide attention. If the mark is correctly identified as anthropogenic, it is evidence that people processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the island's well-established post-glacial settlement record.

The wording "if" is essential. The bone's date establishes the antiquity of the animal, whereas the interpretation of its surface modification requires separate taphonomic judgement. It came from an old collection, not from a newly excavated, tightly documented occupation layer. No securely associated stone-tool assemblage, hearth, dwelling surface, human bone, burial or repeated sequence of occupation has yet been published for Castlepook at this age. The 2022 investigation found surviving cave sediments and sought just such evidence, but its recorded charcoal and hazelnut shell proved modern. The project therefore strengthened knowledge of the cave's survival and complexity without supplying a confirmed Palaeolithic settlement.

Comparison must be equally careful. Directly dated red-deer remains from south-eastern Irish caves have calibrated ranges of 32,930–31,280 cal BP and 30,297–29,594 cal BP. These show that large cervids were present in Ireland during the wider pre-maximum interval, but they neither identify a human group nor date the Castlepook cut mark. The most defensible interpretation is modest: a possible, perhaps brief human visit or episode of carcass processing in an island landscape used by cold-adapted mammals. It is not evidence for an enduring colony, a "first Irish" people, or a continuous ancestry leading to later populations.

Life Without a Recorded Society

If people were present, their economy was necessarily foraging, not farming. Reindeer meat, fat, hide, sinew, antler and bone would all have been valuable resources to mobile hunter-gatherers elsewhere in Upper Palaeolithic Europe. A sharp stone edge capable of cutting fresh bone would imply practical skill in making or using lithic tools. Yet no Irish tool of this date is securely tied to the Castlepook specimen. It would be irresponsible to reconstruct a camp, hunting strategy, clothing style, language, kin group or seasonal route from one modified bone.

There is no evidence from Ireland around this date for political institutions, leaders, warfare, formal diplomacy, trade networks, monuments, ritual sites or organised religion. That is not proof that social rules, storytelling, cooperation, beliefs or exchange of knowledge did not exist among any visitors. Communities in Upper Palaeolithic Europe certainly possessed rich social lives and technical traditions.

But Ireland’s evidence does not allow those wider patterns to be assigned confidently to a local group. Nor can cave deposits be assumed to be shrines: Castlepook’s value lies primarily in palaeontology, geology and the possible trace of butchery.

What This Date Can Mean

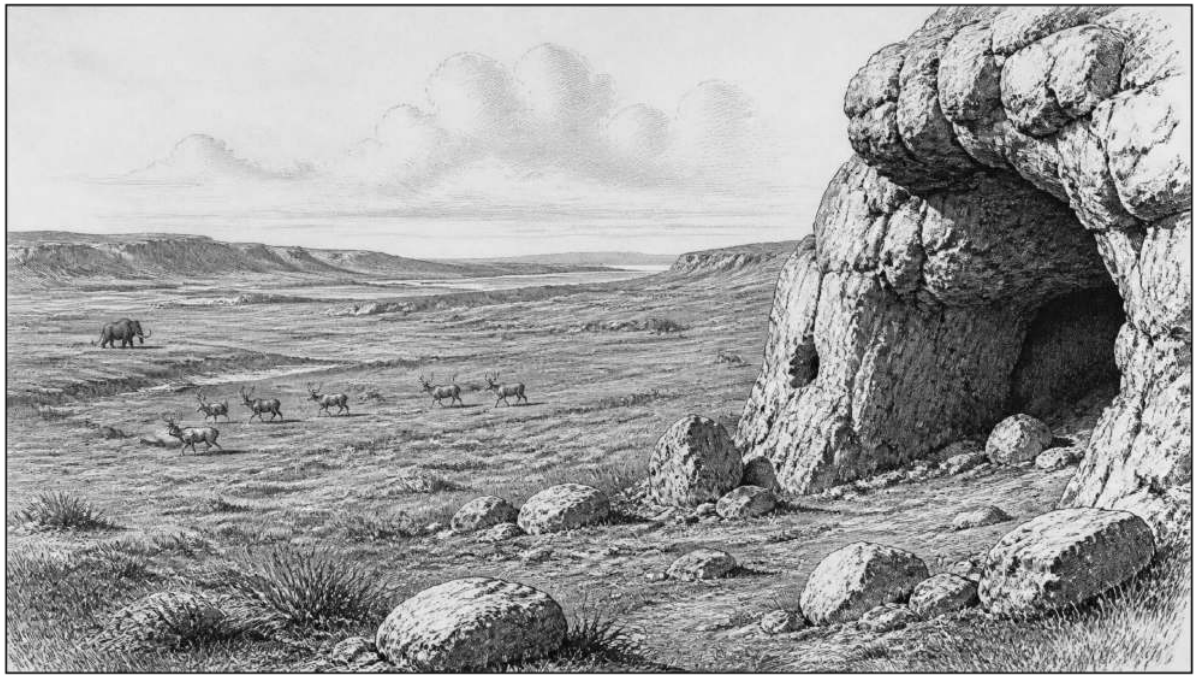
For Ireland, 31,214 BCE is best treated as a window onto a long interval rather than a date of national beginnings. The evidence supports an open, cold, water-dotted environment in places such as Derryvree; a southern fauna including reindeer, mammoth and hyaena at Castlepook across a lengthy span; and a provocative reindeer femur that may preserve Ireland’s earliest known sign of human action. It does not support a calendar-year event, permanent settlement or named prehistoric society.

The most important development, therefore, is methodological as much as historical. Old cave collections, modern radiocarbon methods, palaeoenvironmental analysis and renewed excavation are changing the range of possibilities for Ireland’s deep past. Castlepook suggests that the island may have been visited during an earlier window of the Ice Age. Whether that suggestion becomes securely demonstrated Palaeolithic archaeology depends on finding artefacts, features or further modified bones in reliable context. Until then, the cave should be read as an extraordinary record of an Ice-Age ecosystem—and as a carefully qualified question about people at Ireland’s western edge.

Chapter 088 of 100

31213 BCE

Castlepook’s Redated Fauna [88]



“31,213 BCE” is a modern calendar label, not a year that can be isolated in Ireland’s archaeological record. There are no written dates, events or named people at this depth of time, and even scientific dating cannot distinguish one season from the next. In conventional calendar arithmetic the label lies about 33,162 years before AD 1950, the reference point used for “before present” dating, but that conversion must not be mistaken for an exact archaeological age. Radiocarbon determinations require calibration and carry statistical ranges; old cave collections also have difficult histories of excavation and disturbance. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, broadly c.57,000–29,000 calibrated years before present, rather than an imagined occurrence in one numbered year.

A Landscape Before Maximum Ice

This was Late Pleistocene Ireland, several millennia before the Last Glacial Maximum. The British–Irish Ice Sheet reached its fullest known extent later, around 27,000–23,000 calibrated years before present, when ice covered Ireland and much of its continental shelf. At the notional date represented by 31,213 BCE, conditions were cold and variable rather than simply a featureless island-wide ice sheet. Marine Isotope Stage 3 contained abrupt climatic oscillations, and the extent of glaciers, open ground, vegetation and coastlines changed over long spans rather than according to a single Irish timetable.

Southern Ireland preserves important clues because caves protected some bones and sediments from the erosion that later glaciation inflicted on much of the landscape. Coastal and glacial research shows that parts of southern Ireland experienced marine and terrestrial conditions during Marine Isotope Stages 4–3

before the later advance of the last ice sheet. That does not provide a detailed map for 31,213 BCE, nor does it mean every region was equally habitable. It does establish that the island’s pre-maximum history included intervals in which substantial mammals occupied at least some landscapes now within Ireland.

The best image is of a cold, open and changeable environment: grassland, herb-rich ground, exposed mineral soils, scattered low vegetation and sheltered limestone caves, rather than the dense woodland familiar from later prehistory. This was not the green, settled Ireland of popular imagination. Trees were limited or absent over wide areas, though local plant cover responded rapidly to temperature, moisture and the proximity of ice. Wind, frost, seasonal snow, meltwater and bare ground all shaped the resources available to animals.

The Castlepook Evidence

Castlepook Cave near Doneraile in north County Cork is central to any account of this period. Excavated principally in the early twentieth century, its chambers yielded a remarkable collection of animal remains. Subsequent radiocarbon work has identified a pre-Last Glacial Maximum fauna that includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, as well as evidence from other phases for wolf, Arctic fox and lemmings. These animals should not be pictured as one perfectly synchronous herd or as an intact food web observed on a particular day. Cave collections can accumulate over thousands of years, while predators, water, sediment movement and older excavation techniques can mix materials.

Even so, the assemblage is powerful evidence. Mammoth, reindeer and giant deer point to open, productive grazing landscapes capable of supporting large herbivores. Spotted hyaena is particularly revealing: Castlepook is Ireland’s key site for the species, and hyenas may have used caves as dens or places to carry and consume carcasses. Their presence, together with bones bearing carnivore damage, warns against treating every broken or marked bone as human work. Brown bears, wolves and smaller cold-adapted mammals add further depth to a landscape in which predation, scavenging and seasonal movement mattered.

Modern re-dating has changed the significance of the collection. Improved pretreatment of ancient bone collagen, including ultrafiltration, showed that a number of earlier Irish Pleistocene radiocarbon measurements were too young. The 2020 reassessment of Castlepook and other southern Irish caves pushed several faunal results substantially further back into Marine Isotope Stage 3. Its principal historical consequence is clear: mammals commonly associated with Ice Age north-west Europe had reached Ireland well before the later maximum of glaciation. It also demonstrates why inherited dates must be checked rather than repeated as settled fact.

The Reindeer Bone and Human Possibility

A reindeer femur fragment from Castlepook has made this period especially important for Irish archaeology. It has been reported as dating to roughly 33,000 years ago and as carrying a deep mark interpreted as fresh-bone butchery by a sharp stone implement. If that interpretation is sustained through detailed study, it would be extraordinarily early evidence that a person handled an animal in Ireland during Marine Isotope Stage 3. The claim deserves attention precisely because Ireland has long lacked an accepted archaeological occupation of comparable antiquity.

Its limits are equally important. The date is the age of the animal bone, not a timestamp for the incision. The find comes from an older collection, not from a newly excavated occupation surface with unbroken stratigraphy. No securely associated hearth, stone-tool assemblage, dwelling, human burial, art object or repeated butchery floor of this age has been published from Castlepook. A single potentially anthropogenic modification cannot establish whether people hunted the reindeer, scavenged it after a predator kill, briefly visited the cave, or lived nearby. Nor can it identify a population size, language, ancestry or cultural tradition.

Accordingly, it is not responsible to state that Ireland possessed a permanent human settlement in 31,213 BCE. Nor can the evidence be assigned to Neanderthals or to Homo sapiens. In wider north-west Europe, modern humans were present by this broad period and Upper Palaeolithic societies made sophisticated stone tools and art. But continental and British evidence cannot be imported wholesale into Ireland. Castlepook offers a serious question about a possible fleeting human presence, not a demonstrated Irish Palaeolithic community.

Life, Mobility and Resources

If people did reach Ireland during a favourable interval of Marine Isotope Stage 3, their lives would have depended on mobility and detailed environmental knowledge. Reindeer could yield meat, marrow, fat, hide, sinew, antler and bone; large herbivores were valuable but also unpredictable resources in a cold landscape. Caves offered shelter from weather and may have attracted people, carnivores and scavengers alike. Yet this is a conditional reconstruction based on better-documented hunter-gatherer worlds elsewhere, not direct proof of an Irish camp.

The animal record does demonstrate movement on a larger scale. Mammals reached Ireland from neighbouring landmasses at some point during the Late Pleistocene, when lower sea levels and changing ice margins repeatedly altered the geography of the Irish Sea region. Precisely how each species crossed remains unresolved. Faunal presence proves successful dispersal, but not a permanent land bridge, a single migration route or human travel alongside the animals. Likewise, there is no evidence for trade, exchange networks or boats in Ireland at this date.

What Cannot Be Recovered

There were no states, chiefs, borders or diplomatic relations that archaeology can identify for Ireland around this point. There is no evidence of organised conflict between human groups, and predator activity cannot be converted into a story of warfare. Nothing from this period supports claims about religion, ritual, language, kinship systems, social rank, teaching or artistic traditions on the island. The absence of such evidence is not proof that no people ever entered Ireland; it is a statement about what the surviving record can bear.

Settlement evidence is similarly absent. There are no known houses, campsites, middens, cemeteries or fields attributable to c.33,000 years ago in Ireland. This scarcity partly reflects genuine uncertainty about human presence, but it also reflects preservation. Later ice sheets eroded, buried and reworked older ground surfaces, while sea-level change submerged former coastal landscapes. Cave deposits are therefore disproportionately important, although they are not straightforward archives. The early excavators at Castlepook recovered extraordinary fossils, but their methods predated modern stratigraphic excavation and many deposits had already been disturbed.

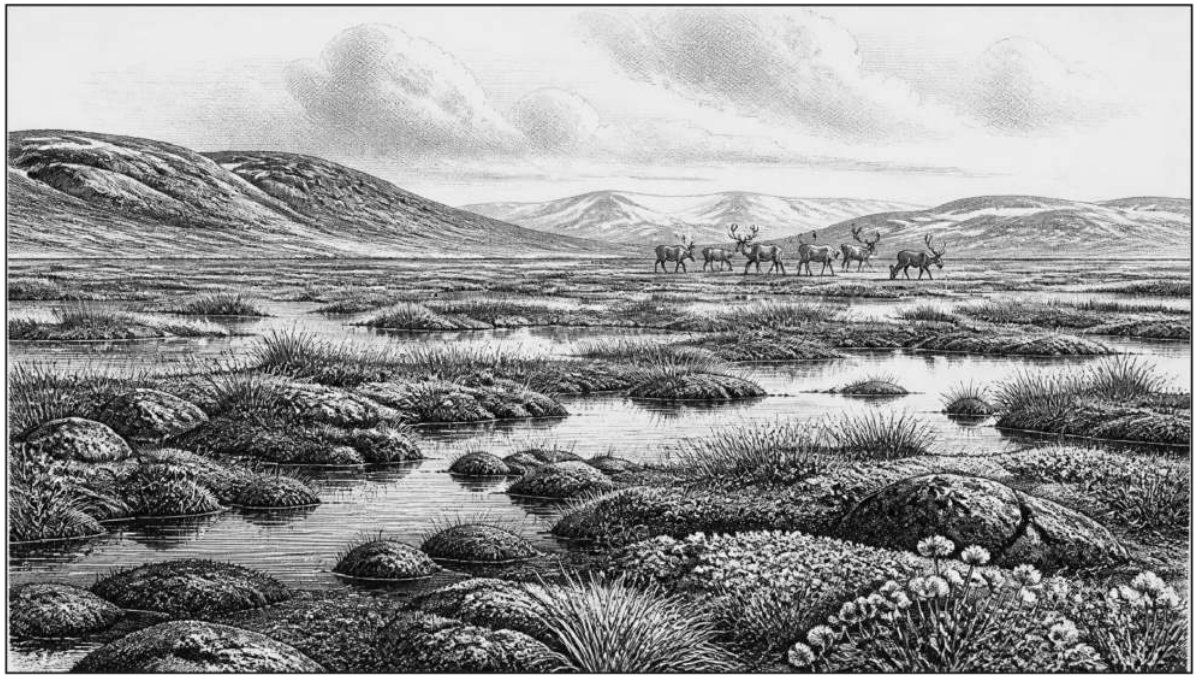
A Small but Transformative Archive

The history of Ireland around 31,213 BCE is consequently not a national origin story. It is the history of a fragmentary archive: cave bones, changing sediments, ice-sheet reconstructions and increasingly exact laboratory methods. Castlepook shows that Late Pleistocene Ireland was at times part of a wider north-west European world of large herbivores and formidable carnivores. Its reindeer femur raises the possibility that people, too, made a brief appearance. But the distinction between a provocative clue and a secure settlement record must remain firm. At this remote point in the Irish past, caution is not a failure of imagination; it is the most accurate form of history.

Chapter 089 of 100

31212 BCE

Derryvree’s Trapped Freshwater [89]



“31,212 BCE” is a useful modern label, not a date anyone then living in Ireland could have named. There was no written calendar, no political record and no archaeological method capable of isolating a particular twelve-month span at such depth in time. In the conventional archaeological system that measures before AD 1950, the notional year falls about 33,161 years before present. It belongs to the Late Pleistocene, within Marine Isotope Stage 3, a long, climatically volatile part of the last Ice Age. The responsible evidence is therefore regional and range-based: buried sediments, fossil plants and insects, animal bones, cave deposits and the landforms made by ice. These reveal changing environments far more clearly than they reveal human lives.

A Date Within a Broad Range

The closest Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed fine sands, freshwater silts and organic material enclosed between two tills: unsorted sediments deposited directly by glacier ice. The sequence is important because it records three separate conditions. Ice had occupied the ground; a later interval allowed freshwater, wetland plants and invertebrates to flourish; then renewed glaciation buried and preserved that evidence. The deposit is not an annual record and cannot tell us what occurred in 31,212 BCE itself.

A radiocarbon determination from Derryvree, BIRM-166, was published as 30,500 ± 1,200 radiocarbon years BP. Calibration, which is necessary because atmospheric radiocarbon has varied through time, places it broadly at about 36,900–31,700 calibrated years BP. The requested year lies within

that wide interval, but cannot be pinned to one layer, one season or one human generation. The range is nevertheless exceptionally valuable: it demonstrates that at least part of north-central Ireland could be ice-free during a severe Late Pleistocene phase before the main expansion of the last Irish Ice Sheet.

Wet Ground in a Cold Country

The Derryvree flora and fauna support a carefully bounded reconstruction. Freshwater mosses and sedges, herb pollen, plant macrofossils and insects of cold northern affinity point to wet ground, shallow pools and decaying vegetation within an open, treeless landscape. This was periglacial country: land strongly affected by freezing and thawing, with short summers, long cold seasons and little or no woodland. Sparse dry-land vegetation may have covered exposed ground beyond the wetland. It should not be pictured as a uniform snowfield, but neither was it the green, enclosed and wooded Ireland familiar from later millennia.

That conclusion applies first to Derryvree, not automatically to the entire island. Ireland’s climate was shaped by Atlantic conditions, topography and the shifting margins of ice, so local environments could differ sharply. A low-lying freshwater basin in Fermanagh preserves one kind of evidence; cave deposits in Munster preserve another. The later passage of glaciers also destroyed or deeply buried many older surfaces. This uneven survival is why Ireland’s evidence for this period is striking but fragmentary.

Ice-sheet history reinforces the need for caution. One influential synthesis uses Derryvree and other sites to argue that the bulk of the last Irish Ice Sheet expanded from largely ice-free conditions after roughly 34,000 years ago, reaching much farther south only substantially later. Other evidence from western Ireland indicates major glacial loading and fluctuating margins over a long interval before the Last Glacial Maximum. These are not necessarily incompatible accounts: they emphasise different sectors of a changing ice mass. Around this notional date, Ireland was probably a geographically varied frontier of cold land, wetlands, ice and nearby marine corridors, rather than an island covered everywhere by one stable sheet.

Castlepook’s Animal World

County Cork supplies the most vivid evidence for animal life. Castlepook Cave, in the Awbeg valley beneath the Ballyhoura Hills and also known as Mammoth Cave, produced Ireland’s richest assemblage of older Pleistocene vertebrate remains. Finds made during early twentieth-century excavation include woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings. The combination evokes a northern, open-country fauna unlike that of later historic Ireland. The cave is especially important because improved radiocarbon methods have shown that several bones are appreciably older than earlier dates had suggested, placing parts of the assemblage in MIS 3.

Yet the list must not be converted into a single, cinematic herd scene. Castlepook was excavated before modern stratigraphic standards, its deposits were complicated, and bones may have entered the cave through different processes and at different times. Carnivores could drag prey or carrion into a cave; water could move smaller material; later disturbance could mix deposits. The presence of mammoth, reindeer and hyaena proves that these species reached Ireland during parts of the broader period. It does not prove that every listed animal met at Castlepook in the same year, or that all occupied precisely the same habitat.

Still, the faunal evidence matters for Ireland's regional connections. Large mammals did not originate on an isolated island without routes of dispersal. Lower sea levels changed the outline of the Irish Sea basin and reduced maritime distances, while ice, sea and exposed terrain shifted repeatedly. Precisely how each species arrived remains debated. There is no warrant for describing a permanent land bridge at this date, nor for assuming a fixed route used by animals or people. The better conclusion is that Ireland was intermittently connected ecologically to the wider north-west European world, even as cold climate and advancing ice made that connection precarious.

The Human Question

The most consequential but least secure human clue is a reindeer femur from Castlepook. It has been reported as carrying a deep incision interpreted by its researcher as a mark made with a sharp stone tool while a carcass was processed; public accounts associate the bone with an age of about 33,000 years. If both the human interpretation and chronological association are sustained, it would indicate a brief Upper Palaeolithic human presence in Ireland far earlier than the well-established post-glacial settlement record.

That possibility must be stated as possibility, not transformed into a settlement narrative. No securely excavated camp, hearth, dwelling, stone-tool assemblage, burial or occupation surface is known from Ireland around this time. The National Museum of Ireland continues to describe unequivocal Palaeolithic human evidence as absent. The tension reflects a genuine scholarly distinction: a single modified bone from an antiquarian cave collection can be significant, but it is not equivalent to a stratified settlement with many independently dated traces.

If people did reach Ireland during this MIS 3 interval, the strongest inference is modest. They would have been highly mobile hunter-gatherers, equipped with perishable materials and stone technology, capable of exploiting animal carcasses or hunting opportunities. Reindeer would have supplied meat, fat, hide, sinew and bone, but Castlepook's femur does not establish whether an animal was hunted, scavenged, transported or merely cut up at the cave entrance. It tells us nothing reliable about the visitors' names, language, ancestry, household size or duration of stay. It certainly cannot establish a continuous population surviving into later Irish prehistory.

Society Without Institutions

Political affairs, diplomacy and organised warfare cannot be recovered for Ireland in this period. There is no evidence for rulers, territories, states, formal alliances or collective institutions. Equally, there is no Irish evidence for shrines, graves, art, ceremony or systems of learning that can be assigned to this date. Silence is not proof that people lacked beliefs, social rules or stories; it means the material record does not permit their reconstruction.

The same restraint applies to economy and trade. There were no farms, cereal fields, domestic livestock, pottery workshops, metalworking or towns. If humans visited, subsistence would have depended on wild resources and mobility. Exchange across long distances is conceivable in Upper Palaeolithic Europe, but no Irish object or provenance study demonstrates a trade network here at c. 33,000 years ago. The practical economy most securely visible is ecological rather than human: wetland plants grew where water persisted, herbivores used suitable open ground, and predators followed prey or carrion.

An Unfinished Irish Past

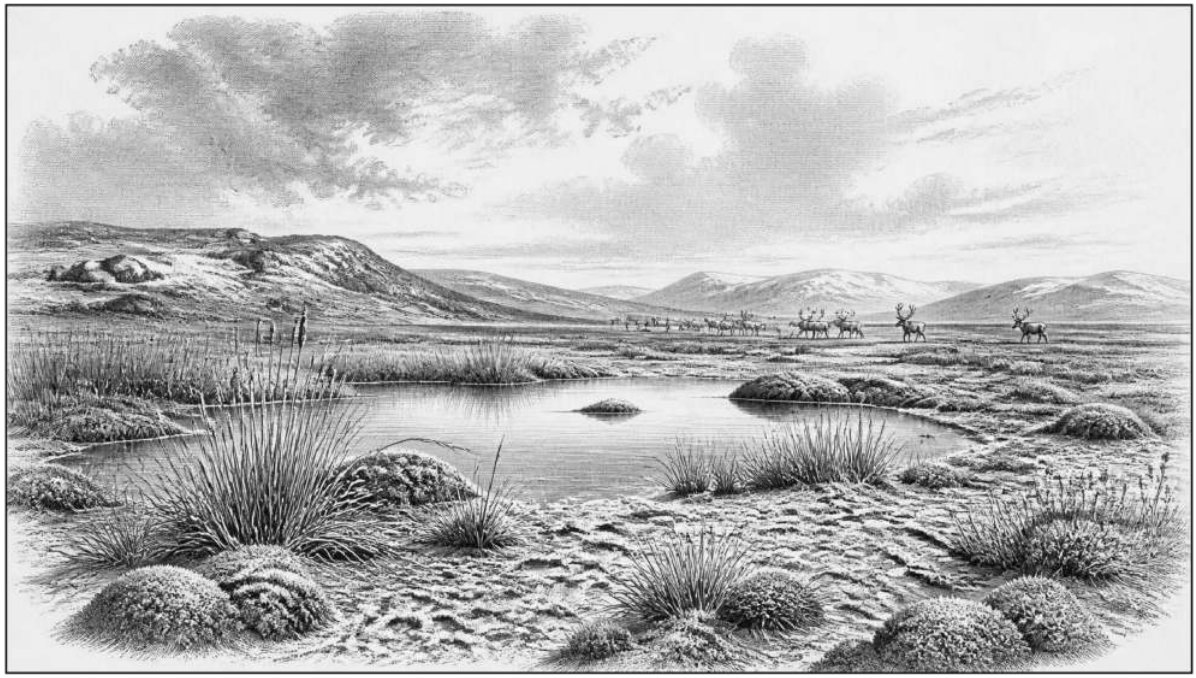
Later ice was both maker and destroyer of this landscape. It scoured bedrock, reworked sediment, altered drainage and buried rare earlier deposits beneath till. Its maximum volume came much later, around 23,000 years ago in a major reconstruction of the British–Irish Ice Sheet, but its growth was already part of the story at 31,212 BCE. The Derryvree wetland was eventually sealed; many comparable places were erased.

Ireland around this notional year is therefore best understood not as a nation awaiting its recorded history, but as a cold and changing Pleistocene landscape. Derryvree provides evidence for freshwater and tundra-like wetland in Fermanagh; Castlepook indicates that remarkable mammals occupied or reached southern Ireland during the wider interval; one marked reindeer bone raises, but does not settle, the question of an early human visit. These are small surviving windows onto a vast span of time. Their uncertainty is not a defect to conceal: it is the central historical fact.

Chapter 090 of 100

31211 BCE

Derryvree’s Mossy Silt [90]



31,211 BCE is a modern retrospective label, not a date that can be recovered with calendar-year precision from Irish deposits. In archaeological convention it lies about 33,160 years before AD 1950, within the Late Pleistocene and broadly within Marine Isotope Stage 3. For Ireland at this depth of time, the responsible scale is not a particular day, season or even necessarily a single human generation, but calibrated ranges and environmental phases extending across centuries or millennia. Radiocarbon ages require calibration, and calibration itself is revised as the underlying curve improves. The evidence for this part of Irish history is therefore fragmentary: cave bones, buried silts, pollen, seeds, mosses, landforms and the changing record of ice.

There was no Ireland in any political or cultural sense recognisable from later history. No names, languages, communities, territories, monuments, settlements or graves can be assigned to this point. Indeed, there is no secure archaeological settlement of this date. What can be reconstructed is a physically severe and changeable island landscape, and the narrow evidential basis for asking whether people may have visited it during an earlier phase of the last Ice Age.

A Landscape Before the Glacial Maximum

This was not yet the Last Glacial Maximum, the interval when the British-Irish Ice Sheet reached its greatest late-glacial extent, conventionally placed broadly between about 28,200 and 20,400 calibrated years before present. Yet Ireland was already part of an ice-age world in which glaciers and ice sheets repeatedly expanded and contracted. Research on the western Irish margin indicates substantial ice loading and major fluctuations before the eventual maximum. The precise outline of ice, coast and exposed land at 31,211 BCE remains uncertain, and it would be wrong to draw a single confident map of the whole island for this nominal year.

That uncertainty matters. Older accounts sometimes described Ice Age Ireland as either simply ice-covered or simply a land bridge waiting to be crossed. Neither formula is adequate. Ice margins moved; relative sea level responded both to global water storage and to the weight of nearby ice; and marine channels could remain formidable even when global sea level was low. At most, the evidence permits the cautious conclusion that movements between Ireland, Britain and the wider north-west European landmass were governed by a shifting mixture of sea, ice, exposed shelf and difficult periglacial terrain. A particular route used by people cannot presently be demonstrated.

The Derryvree Record

The most illuminating Irish evidence for the environmental world near this broad period comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed a drumlin containing freshwater silts and fine sands between two tills: deposits laid down in a non-glacial interval and then sealed beneath later ice-derived sediment. The organic layer produced a conventional radiocarbon result of 30,500 +1,170/−1,030 BP. That is a radiocarbon determination rather than a calendar date, and it does not identify 31,211 BCE as an exact moment. Nonetheless, it places the deposit firmly in the late part of the Ice Age and makes it an exceptional Irish archive for conditions preceding renewed, more extensive glaciation.

Derryvree's pollen, plant macrofossils and small-animal evidence describe an open, treeless and periglacial landscape. Herb pollen predominates, while the plant remains include mosses adapted to cold, wet ground. A seed of bogbean, *Menyanthes trifoliata*, is particularly telling: it indicates freshwater or marshy conditions at the edge of a pool or wet hollow. This was not a forest, a meadow or a modern blanket bog. It was a patchy tundra wetland, with water and saturated sediment in sheltered ground but sparse vegetation over much of the surrounding terrain. Occasional tree pollen is not proof of local woodland; such grains can travel far or be redeposited.

The Derryvree sediments are evidence for a local habitat, not a weather report for every part of Ireland. Their importance lies in showing that ice-age Ireland could contain ecological mosaics: shallow freshwater, sedge-rich margins, mossy ground and open mineral soils, all within a cold climate. Such places may have offered seasonal forage for grazing animals and scavenging opportunities for predators. They also demonstrate that the later ice sheet did not erase every earlier trace. Paradoxically, the sediments survived because they were buried and sealed by the very glacial processes that transformed the landscape above them.

Cork's Cave Fauna and the Human Question

Castlepook Cave near Doneraile in north County Cork supplies a different kind of evidence. Its collections and surviving deposits have yielded an Ice Age fauna including reindeer, woolly mammoth, giant deer, brown bear, spotted hyaena, foxes, wolves and lemmings. The list should not be treated as a census of animals living together on one day. Cave deposits can accumulate over long periods, and bones may be carried in by predators, water, gravity or people; early excavations also recorded material less precisely than modern fieldwork requires. Recent redating has shown that some earlier cave dates were substantially too young, making the Castlepook sequence both more significant and more complicated.

A reindeer femur from the cave is central to discussion of a possible much earlier human presence in Ireland. The bone has been reported as bearing a deep linear modification interpreted as a cut or chopping mark made with a sharp stone implement while the carcass was fresh. If that diagnosis is sustained, it

would indicate carcass processing by people during Marine Isotope Stage 3, long before Ireland's later, securely evidenced hunter-gatherer settlement. But a marked bone is not a campsite. No associated stone-tool assemblage, hearth, dwelling floor, grave or repeated cultural layer has yet been recovered from Castlepook to establish the size, identity, duration or regularity of any human visit.

The careful conclusion is therefore limited but important. Ireland possessed habitats capable of supporting cold-adapted animals, and there is a plausible, still scrutinised indication that people may have briefly reached the island during this earlier Ice Age phase. It does not prove permanent occupation, a population descended from later Irish communities, or an organised hunting territory. The better-established Upper Palaeolithic evidence from Alice and Gwendoline Cave, County Clare, is much later: a butchered brown-bear patella has calibrated dates of 12,810–12,590 and 12,810–12,685 cal BP. That contrast shows how extraordinary the Castlepook claim is, and why it must be held to a high evidential standard.

Life, Society and What Cannot Be Known

If visitors did reach Ireland around this broad period, they would have depended on mobility, detailed knowledge of animal behaviour and the ability to use stone, hide, wood and fire in a cold landscape. Those are reasonable inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not observations made from an Irish camp. There is no Irish evidence at this date for houses, clothing, boats, food-sharing arrangements, family structure or seasonal rounds. Reindeer could have been hunted, scavenged or encountered as carcasses; the Castlepook femur alone cannot decide between a planned hunt and the processing of an already dead animal.

Nor can religion, art, learning or cultural affiliation be responsibly reconstructed for Ireland. Contemporary Upper Palaeolithic groups elsewhere in Europe made sophisticated tools, ornaments and images, and the Paviland burial in south Wales shows that people were present in the neighbouring region during this broad era. Such comparisons establish possibility, not Irish fact. Nothing from Derryvree or Castlepook warrants claims about ritual, beliefs, ethnic identity, diplomacy, warfare or trade across the Irish Sea. The political history of Ireland at 31,211 BCE is therefore not hidden; it is absent from the surviving evidence.

An Island of Ecological Opportunity and Risk

The most important development was environmental rather than institutional. Ireland was being shaped by repeated swings between ice advance, open tundra conditions and short-lived habitable refuges. Wetlands such as Derryvree preserved freshwater life amid a cold, largely treeless setting. Cave archives in Cork retained the remains of large herbivores and powerful predators, recording an ecosystem far richer in mammalian megafauna than later historic Ireland. These were opportunities for any mobile hunter, but they were also precarious conditions in which a worsening climate, advancing ice or altered sea routes could rapidly end access to local resources.

For that reason, the history of 31,211 BCE should not be told as the beginning of a continuous Irish population. It is better understood as a threshold within deep time: an interval illuminated by mossy silts in Fermanagh, animal bone in a Cork cave, and the expanding science of radiocarbon calibration and ice-sheet reconstruction. The record is thin, but it is valuable precisely because it places Ireland within the wider human and environmental story of Ice Age north-west Europe while preserving the distinction between what the evidence demonstrates and what remains possible.

Chapter 091 of 100

31210 BCE

BIRM-166’s Tundra Mosaic [91]



“31,210 BCE” is a useful modern filing label, not a recoverable Irish year. No written calendar, named community or archaeological sequence can identify an event, season or individual generation at that precision. In archaeological terms, it falls broadly about 33,160 years before AD 1950, during the later Pleistocene and before the Last Glacial Maximum. The most responsible account must therefore use dated ranges and environmental records rather than pretend that a year-by-year political history exists. The closest important Irish evidence is a buried freshwater deposit at Derryvree near Maguiresbridge, County Fermanagh, supplemented cautiously by cave fauna from Castlepook, County Cork.

An Archive Between Ice Sheets

Derryvree was exposed accidentally during road works in 1969, when a cutting passed through a drumlin roughly two kilometres north-east of Maguiresbridge. Beneath the drumlin’s form lay an exceptional sequence: one thick glacial till, then freshwater silts and fine sands with organic material, then a second till. Till is sediment deposited directly by glacier ice. The sequence shows that ice had affected the locality, withdrew or ceased to occupy it locally long enough for water and living things to leave a record, and later returned to bury that record beneath fresh glacial debris. It is an archive of changing conditions, not a settlement layer or a snapshot of a single year.

The organic horizon, laboratory sample BIRM-166, produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty of +1,170/−1,030 years. Calibration is essential because radiocarbon years are not identical to calendar years; different calibration approaches express the result as a broad interval centred in the mid-30,000s calendar years BP. Published discussions place Derryvree broadly within approximately 36,900–31,700 calibrated years BP, while another synthesis gives an

indicative calibrated age of about 35.9 ± 1.1 thousand years BP. Either way, 31,210 BCE falls within the wide chronological neighbourhood of this evidence, but cannot be assigned to a particular layer, day or ecological event.

Cold Water, Open Ground

The Derryvree flora and fauna point to an open tundra environment and a periglacial climate. “Periglacial” does not simply mean icy: it describes ground and water systems repeatedly shaped by hard freezing, thawing, seasonal saturation and sparse vegetation in the vicinity of ice. The freshwater sediments preserve evidence for a wet hollow or shallow-water setting amid a broader treeless landscape. Mosses, herb pollen, aquatic plants and small invertebrate remains are especially valuable because they record conditions close to where they lived. The vegetation was not the later Irish image of oak woodland, enclosed fields or blanket bog. It was a low, exposed mosaic of wet places, sedges and herbs, with much bare or thinly vegetated ground.

This does not mean that every part of Ireland looked identical. Derryvree is in present-day Fermanagh and describes a local catchment; it cannot map the whole island. Nor should an inter-till deposit be made to prove uninterrupted ice-free conditions everywhere. Yet it decisively complicates the popular picture of an Ireland sealed continuously beneath ice. Around this broad interval, at least some areas could support freshwater habitats and tundra biota. The island’s terrain was changing through ice advance, meltwater, frost action and sediment movement, while regional differences in altitude, exposure and proximity to ice mattered greatly.

Approaching the Glacial Maximum

The date belongs to a volatile phase before the Last Glacial Maximum, rather than to the maximum itself. Research on the British–Irish Ice Sheet places its greatest overall extent later, around 27,000 years BP, with major ice coverage persisting into roughly 20,000 years BP; the precise form and timing of ice margins around Ireland remain subjects of active reconstruction. Thus the Derryvree wetland was part of an older cold-stage landscape that was eventually overwritten in many places by advancing ice. Later glaciers scoured rock, redistributed sediment and removed or disturbed much of the archaeological evidence that might once have survived.

Lower sea levels accompanied the global growth of ice sheets, but it would be careless to turn that fact into a simple claim that Ireland was joined to Britain or continental Europe by a dependable land bridge at this date. The geography of the Irish Sea region involved changing sea level, crustal adjustment, ice margins, shallow basins and routes that may have been water, ice or difficult coastal terrain at different times. Animal presence demonstrates that some species reached Ireland during the Pleistocene; it does not by itself reveal their exact route, the season of movement or whether people could have followed it easily.

The Castlepook Animal World

Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, provides the strongest complementary view of Irish animal life relevant to this deep period. The cave’s assemblage includes woolly mammoth, reindeer, giant deer, spotted hyaena, brown bear, wolf, Arctic fox, hare and lemmings. Direct dates from its older collections span a long interval rather than one moment: the Irish Quaternary Fauna Project documented animals there from before 45,000 BP through the approach to the

Last Glacial Maximum, including reindeer and mammoth dated in the general range relevant here. These animals imply cold, open habitats capable of supporting large grazers and their predators, with sheltered caves used or entered in very different ways.

But a cave bone assemblage is not a census of a living landscape. Some animals died naturally; others may have been dragged in or scavenged by carnivores; water could move material; and much of Castlepook was excavated in the early twentieth century, before modern recording standards. The bones are therefore time-averaged and contextually uneven. It is defensible to say that cold-adapted mammals occurred in Ireland over a broad span. It is not defensible to place mammoth, hyaena, reindeer and giant deer together beside a particular Fermanagh pool in 31,210 BCE, or to reconstruct a local food web in annual detail.

A Possible Human Trace

Castlepook also raises Ireland’s most intriguing human question for this period. A reindeer femur from the old cave collection has been reported as bearing a deep mark interpreted as damage from a sharp stone implement during fresh-bone butchery, and has been publicised as approximately 33,000 years old. If that interpretation is sustained, it would be evidence that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland far earlier than the island’s formerly accepted human record. The claim deserves serious attention, not least because it directs new investigation towards undisturbed cave sediments and re-examination of museum collections.

Its limits are equally important. A marked bone is evidence for a possible action on an animal, not proof of a resident population. Castlepook has not produced a securely associated hearth, stone-tool assemblage, dwelling floor, burial, human remains or repeated deposit that would demonstrate a camp in this period. The specimen’s old excavation context also makes association difficult. Accordingly, the appropriate wording is possible early human activity or possible carcass processing, not “settlement”, “colony” or “Ireland’s first community”. The better-dated butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, belongs much later, around 12,810–12,590 calibrated BP, and cannot fill the enormous gap between these episodes.

What Cannot Be Written

There is no evidence from Ireland around this horizon for political institutions, rulers, diplomacy, territorial boundaries, organised warfare, religion, formal learning, language, trade networks or permanent settlement. There are no houses, graves, carvings, hearths, toolkits or human skeletal remains securely dated to 31,210 BCE. Continental Upper Palaeolithic communities certainly made sophisticated tools, images and social relationships, but importing their practices wholesale into Ireland would turn analogy into invention. Even if the Castlepook mark proves human-made, it would indicate a fleeting encounter with a carcass, not the beliefs, kinship, economy or identity of those responsible.

The economy visible in the evidence is ecological rather than social: freshwater organisms in a Fermanagh wetland; grazing animals, predators and scavengers in cold open country; and the persistent constraint imposed by climate and ice. Any people present may have moved through a difficult northern Atlantic landscape in small numbers, but that is an interpretation, not a demonstrated Irish settlement pattern. There is no basis for assigning them a named archaeological culture, migration route or relationship with groups in Britain or mainland Europe.

Deep-Time Ireland

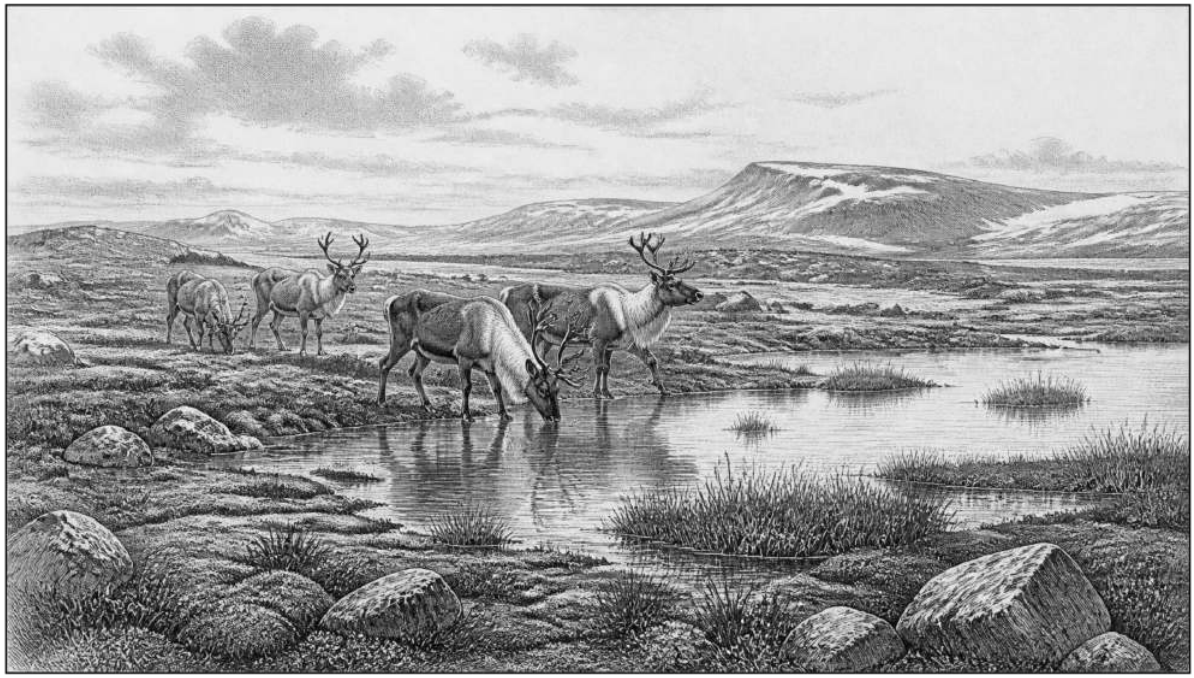
The central development around this notional year was environmental instability. Derryvree records an ice-free or ice-distant interval in which tundra wetland life endured between glacial episodes. Castlepook records that Pleistocene mammals repeatedly reached southern Ireland over a much wider span, and perhaps preserves one tantalising sign of human intervention. Both archives survived largely because later processes buried, preserved or collected fragments of older worlds; both are also incomplete because ice, water, carnivores and antiquarian excavation altered them.

For 31,210 BCE, then, Ireland has no annalistic history. It has a buried wetland, cave bones, radiocarbon ranges and a landscape moving towards more extensive glaciation. That evidence is modest beside the historical record of later millennia, but it is powerful precisely because it fixes the limits of responsible knowledge: a cold, open and regionally varied island; animals adapted to it; and only the unresolved possibility that people briefly passed through it.

Chapter 092 of 100

31209 BCE

Maguirebridge’s Periglacial Pools [92]



The label 31,209 BCE gives an appearance of precision that the evidence cannot sustain. Nobody in Ireland kept a calendar at this depth in time, and archaeology cannot recover an event, person or community from one particular modern-style year. The date is best understood as a point within the Late Pleistocene, roughly 33,159 years before the conventional radiocarbon baseline of 1950, during Marine Isotope Stage 3 of the last Ice Age. The most responsible account is therefore built from calibrated ranges, fossils and sediments rather than a year-by-year narrative in the ordinary sense.

The strongest Irish environmental evidence relevant to this broad moment comes from Derryvree, near Maguiresbridge in County Fermanagh. In 1969, roadworks cut through a drumlin and exposed freshwater silts and fine sands, including organic material, lying between two separate layers of glacial till. The sequence is unusually revealing: ice had deposited the lower till; an ice-free interval then allowed water, mud, plants and small animals to accumulate; later ice or glacier-fed deposition covered the site with upper till. A radiocarbon determination, Birm-166, gave 30,500 radiocarbon years before present, with a large error range. When calibrated, the deposit has been placed broadly at about 36,900–31,700 calibrated years before present. The notional year 31,209 BCE falls inside that wide window, but it cannot be assigned to a particular sediment layer, season or pool.

An Ireland Between Ice Advances

Derryvree shows that at least part of Ireland was not continuously buried beneath ice during this portion of the last glacial cycle. It does not show that the whole island was ice-free, nor that conditions in Fermanagh precisely matched those in Cork, the western seaboard or the Irish Sea basin. The island’s

glaciers repeatedly expanded, thinned and reorganised as the North Atlantic climate fluctuated. The Derryvree freshwater bed records one local opening between glacial episodes; the tills above and below it record the much larger instability of the period.

The broader trajectory matters. Reconstructions of the British–Irish Ice Sheet indicate major growth after this interval, with extensive ice advancing across Ireland before the overall maximum of the Last Glacial Maximum, conventionally placed around 26,000–20,000 years ago. Around 31,209 BCE, then, Ireland was not yet the uniformly ice-dominated landscape often imagined under the phrase “Ice Age”. It was a changing northern land, where locally open ground, wet hollows and running water existed within a wider world becoming increasingly cold and glacial.

Mosses, Sedges and Bogbean

The Derryvree fossils give that landscape texture. Plant macrofossils, pollen and insect remains point to an open tundra or muskeg environment rather than closed woodland. Grasses, sedges, herbs, mosses, low shrubs and cold-adapted plants could grow where soil, moisture and the brief summer season allowed. A particularly evocative find is a seed of bogbean, *Menyanthes trifoliata*, a plant associated with shallow freshwater and wet margins. Its survival in the deposit is direct evidence for pond or marsh habitat; it does not, however, justify imagining a continuous bog stretching across the county.

The treelessness inferred from the assemblage is important. A low, patchy cover of vegetation would have left much ground exposed to frost, wind and seasonal thaw. In sheltered or wet places, vegetation may have been richer; on drier ground, sparse herbs and grasses probably alternated with bare mineral soil and frost-shattered stones. Snow cover, frozen ground and meltwater would have varied sharply through the year. This was not simply an empty white wilderness. It was a mosaic of cold freshwater, wet sedge ground and open land, productive enough in places to support insects and grazing mammals, but far removed from the wooded and intensively settled Ireland of later millennia.

The Castlepook Animal World

For larger animals, the key Irish archive lies far to the south-west at Castlepook Cave, near Doneraile in County Cork, also known as Mammoth Cave. Excavations and museum collections from this limestone cave have produced one of Ireland’s richest Pleistocene faunal assemblages. Its recorded species include woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Not all specimens were deposited at the same moment: the cave accumulated remains across a long span, and many were recovered during early excavations with incomplete modern-style stratigraphic recording. Each bone must therefore be dated and interpreted on its own merits.

Even with that caution, Castlepook establishes that a diverse cold-climate fauna reached Ireland during the broader period before the Last Glacial Maximum. Reindeer were adapted to open, northern environments; lemmings and Arctic fox point in the same climatic direction. Mammoth, giant deer, wolves and hyaenas indicate a food web with large herbivores, predators and scavengers. Caves were not necessarily ordinary animal homes. They could act as dens, traps, sheltering places, carnivore lairs or repositories into which bones were dragged, washed or disturbed. The animal list illuminates habitats and possible movements, not a neat census of a single Irish valley in one year.

The Human Question

Castlepook also raises the most intriguing and unsettled question about Ireland at this date: were people present? A reindeer femur from the cave has been reported as carrying a deep mark consistent with fresh-bone processing by a sharp stone tool, and public interpretation has associated the animal with an age of around 33,000 years ago. If that reading proves secure, it would indicate a human encounter with a reindeer carcass in Ireland vastly earlier than the island's well-established Mesolithic settlement. It would be evidence for an episode of butchery, not proof of a resident population.

The distinction is essential. No securely associated stone-tool assemblage, hearth, dwelling, burial, repeated occupation surface or human skeletal remains of comparable age has been found in Ireland. Nor does one marked bone identify the people involved, their route, language, kinship, beliefs or length of stay. Cave collections are especially difficult because bones of different ages can be mixed by animals, water, collapse and earlier excavation. Radiocarbon dating establishes the age of sampled organic material within a statistical range; microscopic assessment of a surface mark addresses a different question, namely whether an implement or natural process made it.

Accordingly, the best current interpretation is deliberately modest. Ireland may have received brief visits by Upper Palaeolithic hunter-gatherers during favourable intervals, perhaps connected to animal movements or opportunistic use of carcasses. That remains a possibility under investigation, not an established story of colonisation. The earliest published evidence generally treated as secure for human activity on the island is much later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, dated to roughly 12,800–12,600 calibrated years before present.

No Polities, But Real Ecologies

There is no evidential basis for political affairs, diplomacy, named groups, warfare, chiefs, religion or formal learning in Ireland around this point. There were no known farms, villages, monuments, cultivated fields, metal objects, pottery traditions or written symbols. It would be misleading to manufacture them merely to fill modern historical categories. If people visited, their social world must be sought in the wider Upper Palaeolithic record of north-west Europe, not assumed from Irish finds that do not exist.

Nor can economy and trade be described in their later sense. The evidence instead concerns subsistence possibilities: animal carcasses, freshwater margins, seasonal plant growth and the practical value of sheltered limestone caves. A small human party, if present, would have relied on portable knowledge, clothing, fire-making and stone technology, but no Irish assemblage from this period demonstrates those practices directly. The defensible statement is that the landscape could offer resources, while the archaeological record has not yet demonstrated how, or whether, people organised their use of them.

A Landscape With No Recorded Memory

Modern Ireland's familiar coastlines did not exist in the same form. Much water was locked into global ice sheets, lowering sea level, while local ice and land movements altered drainage and shorelines. Yet low sea level alone does not prove a simple dry-land route to Ireland at this specific date. The

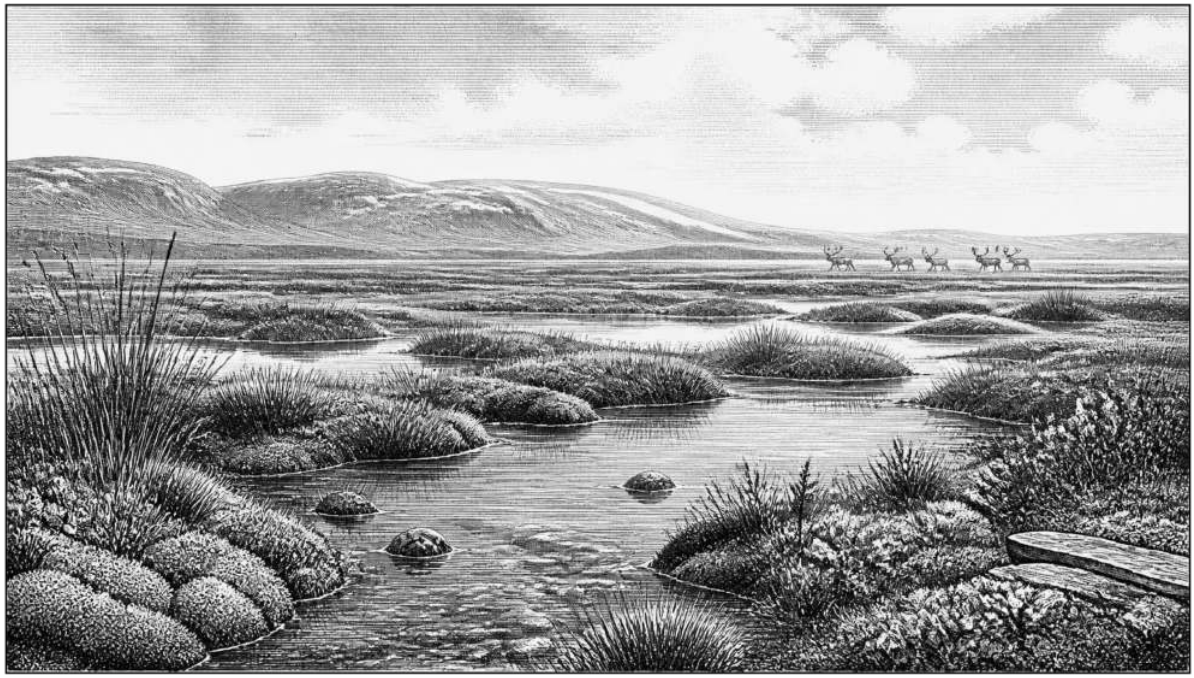
changing Irish Sea basin, ice margins and possible crossings require local reconstruction, and evidence for any human journey remains absent. The island’s later separation and the destructive force of subsequent glaciation are central reasons why its early record is so fragmentary.

The most important development around the notional date 31,209 BCE was therefore environmental, not political: Ireland contained cold but locally varied ice-age habitats during an interval before the great expansion of the last ice sheet. Derryvree’s freshwater sediments preserve sedges, mosses and bogbean beneath a later drumlin; Castlepook’s caves preserve traces of a lost animal world and a tantalising but unconfirmed human story. Together they provide a rigorous historical picture: not a dated event, but a precarious landscape of pools, tundra vegetation and roaming mammals, later transformed and partly erased by ice.

Chapter 093 of 100

31208 BCE

Fermanagh’s Thirty-Millennia Silt [93]



31,208 BCE is a modern chronological label, not a date that can be recovered from an Irish annal, seasonal camp, or individual archaeological layer. It stands about 33,157 years before AD 1950, the conventional “present” of radiocarbon reporting, but that arithmetic does not turn it into a precisely knowable year. At this depth in time, radiocarbon determinations require calibration and commonly yield ranges of centuries or millennia. The responsible subject is therefore Ireland *around* this point in the later part of Marine Isotope Stage 3 (MIS 3), within the last Ice Age, rather than an invented event on a particular day or in a particular year.

Evidence Beneath a Drumlin

The closest well-dated Irish environmental evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed freshwater silts and fine sands trapped between two thick sheets of glacial till. The deposit is exceptionally valuable because it demonstrates an interval in which this locality was not overridden by ice: water, sediment and vegetation accumulated before a later ice advance sealed the evidence. A conventional radiocarbon determination, BIRM-166, was reported as 30,500 +1,170/−1,030 radiocarbon years BP. Later calibration places the organic deposit broadly within about 36,900–31,700 calibrated years BP, a span that includes the notional year considered here.

That range is not an annual diary. It cannot tell us what happened in 31,208 BCE at Derryvree, nor prove that the whole island shared the same conditions at the same moment. Yet it provides an unusually direct local picture of an Irish landscape during the right broad interval. Plant macrofossils, pollen and other biological remains point to a treeless, cold freshwater wetland or muskeg: pools and slow water

bordered by sedges, mosses and low-growing arctic-alpine vegetation. Such evidence records habitats, not political borders or human communities. It nevertheless establishes that parts of Ireland could support freshwater ecosystems during an otherwise severe glacial age.

A Changeable Ice-Age Island

At this time Ireland belonged to a climate system that changed abruptly and repeatedly. Greenland ice-core records identify a sequence of stadial and interstadial shifts during the last glacial period; warming episodes could unfold rapidly by geological standards, while colder phases curtailed plant growth and encouraged the advance of ice. Irish cave calcite from Crag Cave, County Kerry, provides an independent terrestrial indication of this instability. Stalagmites form only when liquid water can percolate through the cave, and their episodic growth in MIS 3 is consistent with intervals of climatic amelioration alternating with much colder conditions.

It would be misleading, however, to picture either a uniformly frozen Ireland or a comfortably habitable green island. The distribution of ice, snow, exposed ground and wetlands varied regionally and changed through time. Modern reconstructions can model ice cover at thousand-year steps, but their most detailed island-wide sequence begins around 31,000 years ago, later than this nominal date. Work on the wider British–Irish Ice Sheet also emphasises that pre-Last Glacial Maximum ice growth and retreat during MIS 3 remain less securely resolved than the final maximum and subsequent retreat. Derryvree's inter-till sediments therefore matter precisely because they demonstrate local ice-free conditions within an uncertain, dynamic wider picture.

The landscape around the Derryvree wetland was not forested. Long winters, short growing seasons, frost-shattered ground and sparse plant cover would have constrained both animals and any passing people. In sheltered low ground, summer thaw could sustain water plants and grazable vegetation; on exposed uplands and open plains, wind and cold would have been formidable. The evidence permits an interpretation of a mosaic of pools, sedge-rich margins, damp ground and open tundra-like terrain. It does not permit a map of every river, coast or ice margin, still less a reconstruction of weather in a single named year.

Castlepook and the Human Question

South-west of Derryvree, Castlepook Cave near Doneraile in north County Cork is the principal faunal archive for this distant period. Its historical excavations produced remains attributed to a striking range of Pleistocene mammals, including mammoth, giant deer, reindeer, horse, bear, wolf, Arctic fox, lemmings and spotted hyaena. Direct dating from the wider Castlepook collection indicates that mammals reached Ireland during several separate phases between at least about 45,000 and 20,000 radiocarbon years ago. The cave is therefore evidence for an intermittently accessible Irish landscape, not for one simultaneous "Ice Age fauna".

The site has special relevance because a reindeer femur from Castlepook has been reported as around 33,000 years old and bears a deep mark interpreted as having been made by a sharp stone implement during fresh-bone butchery. If that diagnosis is sustained, it may be evidence that people processed a reindeer in Ireland tens of millennia earlier than the traditionally accepted terminal-Pleistocene record. It is an important proposition, but not a licence to describe a settlement, tribe or hunting expedition in 31,208 BCE. The femur provides a possible trace of activity within a broad period, rather than a date-stamped event.

Caution is especially necessary because Castlepook's deposits were explored in the early twentieth century, long before present-day standards of stratigraphic excavation, screening, microscopic taphonomic study and accelerator dating. Carnivores, water movement, collapse and earlier collecting all affected the cave archive. A radiocarbon date measures when the animal died, not necessarily the instant at which any surface mark was made; identifying that mark as humanly produced is a separate zooarchaeological judgement. Earlier work on Irish cave faunas repeatedly found that bones of very different ages had become mixed in apparently similar contexts. Castlepook is consequently best treated as a vital but complicated archive.

Animals, Subsistence and Mobility

The faunal evidence makes clear that Ireland was not biologically empty during the broader MIS 3 interval. Reindeer imply open vegetation and seasonal grazing opportunities; mammoth and giant deer belong to the wider cold-stage large-mammal world; hyaena and wolf indicate predators and scavengers within the same broad ecological network. But individual species' dates need not overlap exactly, and cave assemblages may represent denning, scavenging, natural deaths or material washed into chambers. The secure conclusion is that animal populations entered and used parts of Ireland at different points before the fullest expansion of the last ice sheet.

If humans did visit, their economy would have depended on mobility, knowledge of animal movements, fuel, shelter and the seasonal availability of food rather than farming or permanent village life. Reindeer meat, marrow, hide, sinew and bone would have been useful resources, but Castlepook has not produced a securely associated hearth, dwelling floor, tool assemblage or processing area of this age. Nor is there evidence for agriculture, livestock, pottery, metalworking, monuments, burial practice or a settled population. A brief foray by a very small group and a longer occupation would leave different archaeological signatures; neither can presently be demonstrated for Ireland around this date.

No Polities, No Proven Diplomacy

Political affairs, warfare, diplomacy, law, religion and formal learning cannot responsibly be reconstructed for Ireland in this period. There are no names, written records, settlements or ritual structures. Likewise, no evidence identifies trade routes or exchange partnerships. It is reasonable to infer that any people capable of reaching Ireland were part of wider Upper Palaeolithic worlds beyond the island, but it is not evidence that they maintained a regular Irish population or a defined maritime network. Even the practical route remains unresolved: lowered sea levels altered coastlines, yet the exact crossings, exposed shelves and ice barriers relevant to any visit cannot be specified from the present evidence.

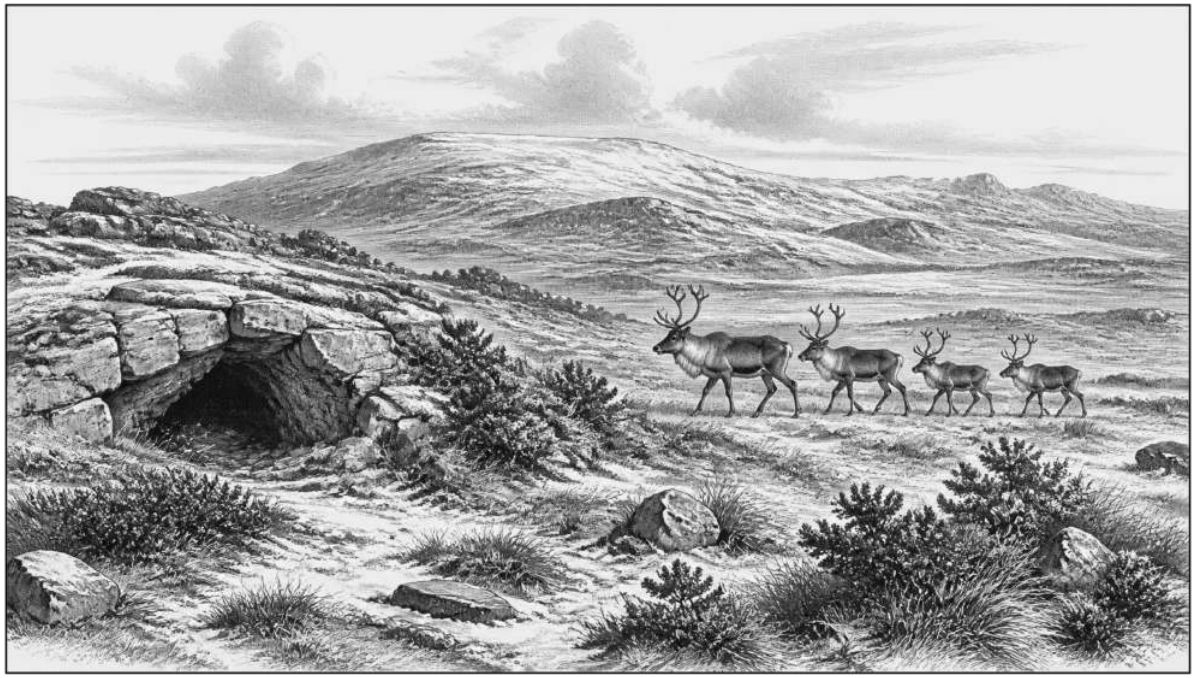
The cultural achievement visible here is instead modern scientific reconstruction. At Derryvree, sediments, pollen and plant fragments preserve a brief environmental window between glaciations. At Castlepook, bones preserve evidence of animals and a provocative possible human action, while simultaneously demonstrating how difficult cave deposits are to interpret. These archives shift attention away from imagined chiefs and battles towards the real drama of deep Irish time: climate oscillation, advancing ice, freshwater refuges, animal movement and the possibility of a fleeting human presence at Europe's Atlantic edge.

For 31,208 BCE, then, the most defensible account is deliberately modest. Ireland contained, at least in some regions and at some points within this broad calibrated interval, cold open landscapes capable of supporting wetlands and large mammals. Derryvree proves one local ice-free freshwater episode; Castlepook preserves a long, mixed faunal record and a potentially momentous but still limited clue to human butchery. Beyond that, modern calendar-year precision disappears. The evidence illuminates conditions and possibilities, not a recoverable Irish “year” in the historical sense.

Chapter 094 of 100

31207 BCE

Cork’s Spotted Hyenas [94]



31,207 BCE is not a date that can be recovered from Ireland’s archaeological record as a single historical year. It is a modern calendar label projected far back into the Late Pleistocene. In the usual archaeological convention it falls roughly 33,150 years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last glacial cycle. No Irish community used a calendar, left writing, or can be assigned to this particular year. The responsible task is therefore to examine dated ranges, deposits and fossils that illuminate Ireland around this broad horizon, while separating what they demonstrate from what remains interpretation.

A Date Without a Chronicle

Radiocarbon dating is central to this subject, but it does not produce the kind of precision implied by a numbered BCE year. A radiocarbon determination dates the death of organic material, such as an animal bone, and must then be calibrated against changing atmospheric carbon levels. Calibration converts a radiocarbon age into one or more ranges of calendar probability; it does not identify a particular season, event or human action. At more than 30,000 years ago, the ranges are especially important. The current IntCal20 calibration curve extends to 55,000 calendar years before present, but the curve’s structure means that apparently modest laboratory uncertainties can translate into broad calendar intervals.

For Ireland, the evidence nearest this horizon comes principally from cave faunas in the south and south-east, together with glacial and periglacial deposits elsewhere. A newly assessed brown-bear specimen from Shandon Cave, County Waterford, for example, has a calibrated age range of approximately 34,524–32,713 cal BP. That range spans the approximate calendar position represented by

31,207 BCE. It establishes that brown bear lived in this part of Ireland during a portion of MIS 3; it does not establish where it travelled in a given year, nor prove that every animal from nearby caves belonged to one contemporaneous landscape.

Before the Last Great Advance

This was an Ice Age Ireland, but not necessarily an Ireland uniformly buried beneath the maximum ice sheet familiar from maps of the Last Glacial Maximum. The fullest late-glacial expansion of the British–Irish Ice Sheet is generally placed later, around 25,000–23,000 years ago, with retreat continuing thereafter. At roughly 33,000 years ago, conditions belonged to an earlier and more changeable phase of the glacial cycle. Evidence indicates that ice had advanced in parts of Britain and Ireland during MIS 3, yet its precise extent, thickness and timing across Ireland remain subjects of reconstruction rather than settled fact.

That uncertainty matters. Older deposits have often been overridden, disturbed or removed by later ice, while cave sediments may preserve bones from several episodes in a single excavated deposit. Southern Ireland has sometimes been reconstructed as containing extensive periglacial ground rather than a continuous ice cover during parts of the Midlandian glaciation. Elsewhere, ice-flow landforms and tills show that moving ice repeatedly reshaped the country. Neither proposition permits a simple island-wide map for 31,207 BCE. The safest conclusion is that Ireland contained shifting zones of ice, frozen ground, exposed rock, sparse vegetation and animal habitat, all subject to pronounced climatic fluctuation.

Sea level was far below its modern position because vast quantities of water were locked in northern ice sheets. The outlines of Ireland’s coasts were therefore different, with broad areas of today’s continental shelf exposed or transformed into shallow seas, shorelines and lowland corridors. Fossil mammals demonstrate that Ireland was not biologically isolated in the way it would become after post-glacial sea-level rise. They arrived from the wider north-west European world, probably through changing combinations of land, coastal and ice-margin routes. The exact character and availability of those routes at this precise moment cannot be reconstructed securely.

The Cave Record of Southern Ireland

Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork is the most evocative Irish site for this period. Excavations undertaken between 1904 and 1908 recovered a remarkable assemblage now substantially held by the National Museum of Ireland. It includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyena. The hyena material is of particular importance: Castlepook is Ireland’s best-known source of this formidable Pleistocene carnivore, and the museum collection includes a partial skull as well as jaws and other bones.

These remains give substance to an Ice Age ecosystem, but they must not be converted into a single crowded tableau. Bones in caves may have been dragged in by carnivores, washed or fallen into fissures, redeposited, excavated with imperfect early methods, or separated in age by thousands of years. Improved collagen pretreatment and re-dating have shown that some previously obtained ages were too young. Ruth Carden, Thomas Higham and Peter Woodman’s reassessment of southern Irish cave fauna shifted several specimens significantly further back into MIS 3 and argued that giant deer and spotted hyena may have disappeared locally before the Last Glacial Maximum.

The important evidence is thus twofold. First, southern Ireland supported, at intervals during MIS 3, large herbivores and predators whose ranges connected Ireland to continental and British faunas. Secondly, the cave deposits themselves record accumulation and preservation, not an undisturbed census. A mammoth rib, a reindeer bone or a hyena scapula reveals that the animal reached Ireland and died within a dated range. It cannot by itself tell us population size, seasonality, herd structure, predator numbers or whether the species overlapped at the cave entrance on the same day.

A Cold, Varied Country

The animals imply habitats more varied than a featureless white wilderness. Reindeer, lemmings and Arctic fox are consistent with cold, open environments, while giant deer, bears, wolves and hyaenas point to a broader mosaic of grazing, shelter and carrion resources. Their Irish occurrence belongs to a wider north-west European mammoth-steppe and tundra-margin world, though local conditions were shaped by relief, drainage, proximity to ice and rapid climate shifts. The limestone country around Castlepook supplied caves and fissures that later protected bones; it was not necessarily a permanent den, hunting ground or settlement site.

Organic sediments sealed between glacial deposits in northern Ireland provide a complementary, though chronologically less exact, perspective. At sites such as Aghnadarragh and Maguiresbridge, plant macrofossils, pollen and beetle remains have been used to reconstruct interstadial landscapes within the long MIS 3 interval. They indicate that some ice-free episodes could support wet ground, pools, mosses, sedges, dwarf shrubs and, in some records, trees or tree-derived material. Yet such deposits can include transported material, and correlations to particular Greenland interstadials are debated. They are regional environmental archives, not weather reports for 31,207 BCE.

Everyday life for animals was governed by seasonality: forage quality, snow or frozen ground, water availability, exposure to wind and the danger posed by predators. For a spotted hyaena, a cave could offer a place to shelter or accumulate food remains; for herbivores, the key landscape was the open country beyond it. The evidence supports seasonal ecological pressures, not detailed claims about migration routes or animal behaviour at one named Irish locality.

The Human Question

There is no securely demonstrated human settlement, household, burial, hearth or tool-making floor in Ireland dating to about 31,207 BCE. Accordingly, there can be no responsible account of Irish political affairs, diplomacy, warfare, religion, language, learning or trade for this year. There are no known chiefs, peoples or territorial communities to name. It would be misleading to infer them merely because modern humans were living elsewhere in western Europe.

One find keeps the question open. A reindeer femur from Castlepook has been interpreted as bearing an incision made by a sharp stone tool, perhaps during carcass processing, and has been associated in public discussion with a date around 33,000 years ago. If that interpretation and chronological association are sustained, it could indicate a very early human incursion into Ireland. But the distinction between a date for an animal bone and a date for the mark upon it is fundamental. The cut-mark diagnosis requires separate microscopic and taphonomic assessment, while the cave’s disturbed and mixed deposits prevent the bone from demonstrating a settled population or a year-specific visit.

The firmer benchmark remains much later. At Alice and Gwendoline Cave in County Clare, a brown-bear patella with evidence of butchery has been directly dated to the opening of the Younger Dryas, approximately 12,890–12,678 cal BP. Recent work also demonstrates how cave sediments can be moved by runoff, colluvium and animal disturbance. That later find proves that people reached Ireland during the terminal Pleistocene; it does not retrospectively prove human occupation at Castlepook twenty millennia earlier.

What Ireland Can Reliably Say

Around the broad time represented by 31,207 BCE, Ireland was a changing north-western refuge and corridor within the Late Pleistocene world. Its landscapes were being shaped by frost, water, sparse plant cover and the movements of ice sheets. Its south-eastern and southern caves preserve compelling evidence for an extinct fauna that included brown bear, giant deer, reindeer, mammoth and spotted hyaena at different points in MIS 3. These animals are the clearest inhabitants of the period. They testify to ecological connectivity beyond Ireland and to environmental opportunities that later ice and rising seas would repeatedly alter.

The absence of an Irish historical narrative is not an absence of history. It is a reminder that deep time is recovered through material traces with uneven survival. The caves of Cork and Waterford, the buried wetland beds of the north, and the glacial forms across the island offer evidence on different scales. Together they allow a cautious picture of an Ireland before the Last Glacial Maximum: cold, dynamic, intermittently habitable for large mammals, and still uncertain as a landscape of human arrival.

Chapter 095 of 100

31206 BCE

Castlepook’s Deep-Time Reindeer [95]



“31,206 BCE” is a modern calendar label applied to a point far beyond the reach of annals, named rulers or year-by-year memory. It should not be mistaken for a date on which an identifiable Irish event occurred. In radiocarbon convention this point lies roughly 33,155 years before AD 1950, but the evidence available for Ireland consists of deposits and bones dated within broad probability ranges, not historical years. The responsible setting is the later part of the Late Pleistocene, within Marine Isotope Stage 3: a climatically unstable interval before the fullest expansion of the last Irish Ice Sheet.

For this approximate moment, Ireland’s history is principally environmental. The island’s landscape, fauna and possible human use can be approached through a small number of unusually important archives: organic sediments buried beneath later ice deposits in County Fermanagh, and fossil animal assemblages recovered from caves in the south. They illuminate long spans of time, often centuries or millennia. They cannot tell us what happened in this exact numbered year.

A Date Beyond Chronicle

There were no Irish kingdoms, states, written records or recoverable named communities in 31,206 BCE. Indeed, the available evidence does not establish a permanent human population in Ireland at this time. It is therefore misleading to supply prehistoric equivalents for politics, diplomacy, warfare, religion or trade. No settlement hierarchy, burial ground, shrine, fortification, exchange network or artistic tradition of this age is securely known from Ireland.

That absence is itself historically significant. Ireland’s deep past was shaped by abrupt climatic shifts, changing ice margins, sea-level change and the movements of animals across north-west Europe. Human communities existed elsewhere in Europe during the Upper Palaeolithic, but it does not follow that a

continental archaeological culture, its beliefs or its social organisation can be assigned to Ireland. The Irish record must stand on its own evidence.

Chronology needs equal care. Radiocarbon laboratories measure the remaining carbon in once-living material and return an age with a statistical uncertainty; researchers then calibrate it against past variation in atmospheric radiocarbon. At around 33,000 years ago, calibrated results frequently span many centuries. A bone date tells us when the animal lived and died within a range, not necessarily the precise moment when it was moved, gnawed, cut or buried. Thus 31,206 BCE is best treated as a point lying within wider archaeological and environmental ranges, rather than as a recoverable episode.

Derryvree’s Cold Wetland

The clearest Irish environmental evidence relevant to this broad period comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 exposed organic freshwater silts and sands enclosed between two beds of glacial till within a drumlin. The sequence records a powerful local history: ice laid down the lower till; the site subsequently became an ice-free freshwater environment; and later ice deposited the upper till over it. It is direct evidence against a simple image of Ireland as continuously ice-covered throughout the whole Late Pleistocene.

A conventional radiocarbon determination from the Derryvree organic deposits was 30,500 ± 1,200 radiocarbon years before present. Later calibration has placed the deposit broadly at about 36,900–31,700 calibrated years before present. The modern label 31,206 BCE falls within the long chronological neighbourhood represented by that range, but it cannot demonstrate that the sampled pool, plants or insects existed in that particular year. Nor should one Fermanagh exposure be treated as a weather station for the entire island.

What Derryvree does reveal is vivid. Pollen, plant macrofossils and beetle remains point to a treeless, cold, waterlogged landscape often described as tundra or muskeg. Sedges and grasses grew among mosses and herbs; low shrubs, including dwarf willow, had a place in the vegetation. Fossils of water plants such as bogbean and alternate water-milfoil show that shallow open water occurred amid the wet ground. The result was not a featureless white wilderness, but a patchwork of pools, saturated mossy ground, sedge-rich margins and exposed mineral surfaces.

Winters were severe and the growing season short. Yet the wetland evidence demonstrates biological productivity: plants rooted, insects completed life cycles and freshwater habitats persisted for long enough to leave a layered record. It also suggests regional variation. Sheltered basins and watercourses could support richer local ecologies than windswept uplands or ground close to advancing ice. Ireland around this date was environmentally fragmented, with opportunities and hazards changing across short distances and over generations.

The Cave at Castlepook

In north County Cork, Castlepook Cave near Doneraile—also called Mammoth Cave—provides a contrasting archive. Its deposits and museum collections contain a notable Late Pleistocene fauna, including woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Together these remains show that, at intervals before the Last Glacial Maximum, parts of Ireland supported a substantial cold-stage food web. Large herbivores required extensive forage; carnivores followed prey and scavenging opportunities; smaller mammals belonged to open, cold-adapted habitats.

This list must not be converted into a single painted scene. Cave assemblages are accumulations, not snapshots. Animals may have died in different centuries or millennia; carnivores may have dragged bones underground; water and gravity may have moved material; and excavation methods used at Castlepook in the early twentieth century did not provide the stratigraphic control expected today. Recent reassessment and improved radiocarbon pretreatment have also shown that some older Irish dates require revision. The cave is invaluable, but it is a complicated archive.

Its most arresting object is a reindeer femur fragment identified in the National Museum of Ireland’s collections. The bone has been publicised as approximately 33,000 years old and bears a deep surface mark interpreted by zooarchaeologist Ruth Carden as consistent with cutting or chopping by a sharp stone tool while the bone was fresh. If that reading is confirmed, it would be potentially the earliest evidence of human activity in Ireland, enormously earlier than the well-supported terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

The qualification matters. The femur offers a possible trace of carcass processing, not a settlement. It does not prove that a reindeer was killed at Castlepook, that a group lived in the cave, or that the island had a resident population. No securely associated hearth, stone-tool assemblage, dwelling floor, human burial, art or repeated occupation horizon of comparable age has been established there. The date of the bone is also not an exact date for the mark. The strongest conclusion is deliberately modest: people may have encountered, butchered or transported reindeer in Ireland during this broad period.

People at the Atlantic Edge

If people did reach Ireland, they would have faced a demanding world. Their practical economy would have depended on close knowledge of animal movements, sheltered ground, fuel, water, stone and weather. Reindeer offered meat, marrow, hides, sinew and bone; other game and scavenged resources may have been important. But these are informed possibilities drawn from the ecological setting and wider Upper Palaeolithic experience, not demonstrated Irish practices. The Castlepook bone cannot reveal the size of a party, its language, kinship system, technology beyond the suggested sharp implement, or how long it stayed.

Nor is there evidence for regular trade. Lower sea levels altered the outline of the Irish Sea and reduced some distances, but the coastlines, channels and practical routes of this period were unlike those of today. Animal and human movement between Ireland, Britain and continental Europe may have been possible at intervals, whether by land connections, narrow water crossings or combinations of both; the evidence does not permit a date-specific route map for 31,206 BCE. What is secure is ecological connection: Irish fauna belonged to wider north-west European populations rather than developing in isolation.

Political affairs and conflict are beyond recovery. Predators and scavengers competed over carcasses, but that is not evidence of human warfare. Likewise, there is no Irish material from this horizon from which to infer ceremony, religious belief, cave art, teaching or formal learning. The absence of evidence should not be turned into a claim that Ice Age visitors lacked culture. It simply recognises that no such culture has yet been recovered in Ireland.

Approaching the Great Ice

At the scale of the whole island, the most consequential development was climatic deterioration and the eventual growth of the British-Irish Ice Sheet. The Last Glacial Maximum came later, broadly between about 26,000 and 20,000 calibrated years before present, but ice expansion was neither instantaneous nor uniform. Evidence from Derryvree and other northern Irish sequences indicates that north-central Ireland retained ice-free ground until at least around 34,000 years ago. Around the notional date of 31,206 BCE, Ireland was therefore in a long transition rather than already a uniformly frozen island.

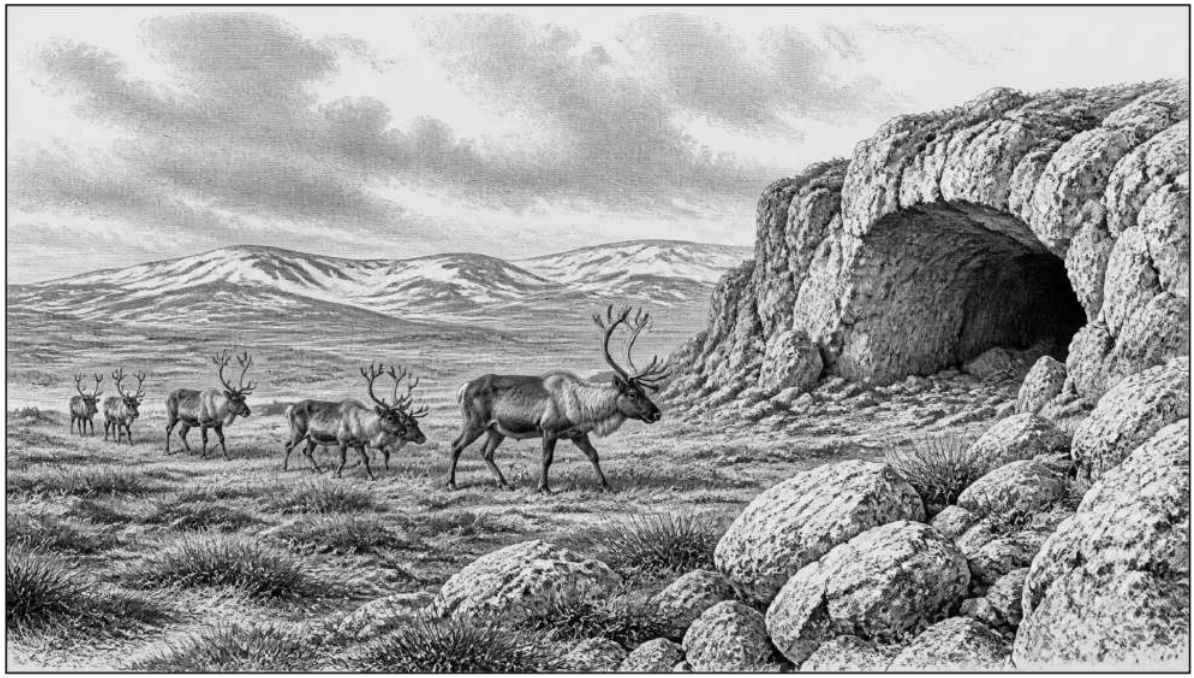
Later ice repeatedly reshaped the terrain, deposited tills and obscured earlier surfaces. This is one reason why the evidence is so sparse: camps on exposed ground were unlikely to survive intact, while caves and sediment-filled hollows preserved only selected traces. The archaeological silence may reflect genuinely brief or rare human visits, but it also reflects the destructive force of subsequent glaciation and the limited modern investigation of old collections.

The year’s proper historical emphasis, then, is not a fabricated episode but a precarious horizon. Derryvree preserves an ice-free northern wetland within a cold, treeless Ireland; Castlepook preserves the bones of a southern fauna rich enough to include reindeer and mammoth; and one marked reindeer bone raises, without conclusively answering, the question of an Upper Palaeolithic human presence. In 31,206 BCE, Ireland was not yet a country of documented inhabitants. It was an Atlantic-edge landscape of sedge water, open tundra, large animals and approaching ice—known through fragments, and requiring restraint as much as imagination.

Chapter 096 of 100

31205 BCE

Castlepook’s Solitary Reindeer [96]



“31,205 BCE” is a modern chronological label, not a date that anyone living in Ice Age Ireland could have recorded. At this depth of time, calendar-year precision is unavailable. The label corresponds only approximately to 33,150 years before 1950, within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the Late Pleistocene. Radiocarbon results from this era must be calibrated and normally produce ranges rather than a single year. The responsible subject, then, is not an event on a particular day or in a particular year, but the fragmentary evidence for Ireland in the millennia around it.

A Landscape Before the Maximum Ice

This was before the Last Glacial Maximum, when the British–Irish Ice Sheet later reached its greatest known extent, broadly between about 27,000 and 23,000 calibrated years ago. Ireland was not yet necessarily the uniformly ice-covered country often imagined from its later Ice Age history. It formed part of a northern Atlantic world in which glaciers, sea ice, ocean circulation and vegetation could change sharply over centuries or millennia. MIS 3 itself is defined by repeated abrupt oscillations between colder stadials and relatively milder interstadials. A single nominal BCE year cannot tell us which short-lived climatic phase was being experienced at a particular locality.

That uncertainty matters. The evidence suggests that parts of Ireland had supported terrestrial mammals during earlier Late Pleistocene intervals, but it does not permit a national weather report for 31,205 BCE. The Irish landscape was probably a patchwork shaped by cold, wind, frozen ground, sparse cover and changing ice margins. Open grass-herb communities, dwarf shrubs and tundra-like vegetation

are more defensible comparisons than forests or settled pasture. Conditions varied markedly with altitude, exposure, drainage and proximity to ice. Rivers and shallow basins could create locally richer strips of vegetation and water, while exposed uplands and ground close to glaciers offered little shelter.

Substantial sea-level lowering altered coastlines, but it did not make access to Ireland a simple matter. The geography of the Irish Sea changed as water was locked in continental ice, yet the exact configuration and habitability of possible crossings varied over time. Animal arrivals show that dispersal was possible during some Pleistocene windows; they do not prove a permanent land bridge, a single migration route or easy travel for people. Ireland’s position at Europe’s north-western edge remained a powerful ecological filter.

Caves, Bones and a Narrow Window

The most relevant Irish evidence comes from cave deposits, above all Castlepook Cave near Doneraile in north County Cork. Its faunal archive has produced remains attributed to animals including mammoth, reindeer, giant deer, spotted hyaena, wolf, fox and bear. Taken together, such finds demonstrate that parts of Ireland could at times sustain a cold-climate large-mammal community. They do not mean that all these animals occupied the same valley, or even the island, simultaneously. Caves accumulate material over long periods through deaths, predation, scavenging, water movement, roof fissures and later disturbance.

This distinction is central at Castlepook. Much of its bone assemblage was excavated in the late nineteenth and early twentieth centuries, when recording standards were unlike those expected today. Later research has shown that some cave material was disturbed or reworked. Radiocarbon determinations on individual bones therefore date those bones, not a neatly bounded occupation layer. The 1997 Irish Quaternary Fauna Project nevertheless identified a pre-Last Glacial Maximum sequence in which several mammals had reached Ireland between at least roughly 45,000 and 20,000 radiocarbon years ago. Its results remain valuable, while also warning against treating the cave as a snapshot.

Older dates from Castlepook include a mammoth bone reported at 33,500 ± 1,200 radiocarbon years BP and a spotted-hyaena bone at 34,300 ± 1,800 BP. Such determinations overlap broadly with the time represented by this entry after calibration, but their uncertainties are large and radiocarbon ages are not calendar ages. Giant deer and reindeer were also among the fauna recovered. The secure conclusion is modest but important: south-western Ireland was intermittently available to sizeable grazing and browsing animals, together with predators and scavengers, long before the great ice advance.

The Reindeer Bone Question

A reindeer femur from Castlepook has given this period exceptional public interest. County Cork heritage material reports that it dates to about 31,000 BC and bears a deep mark interpreted by zooarchaeologist Ruth Carden as a cut or chop made during butchery with a sharp stone tool. If that interpretation and attribution withstand further scrutiny, it would be the earliest known indication of human activity in Ireland: evidence that a person or very small party handled a reindeer during MIS 3.

But this is not evidence for an Irish population in the usual sense of the word. There is no securely associated hearth, stone-tool assemblage, dwelling, burial, food store, art panel or repeated concentration of butchered bones from Castlepook at this age. Nor can the dated bone establish the precise moment that the mark was made. Its discovery is a compelling research lead, not a licence to populate the cave mouth

with an imagined camp. The appropriate formulation is that human butchery has been proposed for a reindeer bone of broadly this antiquity; permanent settlement, group size, language, identity and duration of any visit remain unknown.

The caution is strengthened, rather than weakened, by later Irish cave research. At Alice and Gwendoline Cave in County Clare, a brown-bear patella with cut marks has been robustly dated to the terminal Pleistocene, around 12,800–12,600 calibrated years BP. That much later find supplies clearer evidence that humans reached Ireland in difficult glacial conditions. It demonstrates what rigorous dating and close study of fresh-bone marks can achieve, but it cannot be projected backwards to describe Castlepook's visitors tens of millennia earlier.

No Politics, Only Possibilities

There is no evidence from Ireland around this time for political institutions, chiefs, territories, warfare, diplomacy or named communities. There is equally no Irish evidence for ritual sites, burial practice, artistic traditions or formal learning. Absence of evidence is not proof that people lacked social relationships, beliefs or knowledge; it means that none can responsibly be reconstructed for this island and period. Upper Palaeolithic societies elsewhere in Europe made sophisticated stone tools, maintained wide social networks and sometimes created ornaments and art. These comparisons establish human capacity in the wider world, not an Irish cultural inventory.

If people did reach Castlepook, the practical act indicated by the marked bone would have been economically significant: obtaining meat, marrow, hide, sinew or bone from a reindeer. Reindeer were highly mobile animals adapted to cold environments, and a single carcass could be valuable to a small travelling group. Yet even this inference must stay close to the object. It does not establish that people hunted the animal rather than encountered a carcass; nor does it demonstrate seasonal rounds, trade, clothing styles or a reindeer-focused economy. No exchange goods or imported lithics of this age have been securely identified in Ireland.

Animals as Environmental Witnesses

The animal record provides the strongest evidence for everyday ecological realities. Mammoth, reindeer and giant deer imply open country with substantial plant resources, while hyaena and wolf imply carnivore pressures and complex carcass histories. Arctic fox, lemmings and other cold-adapted animals in Irish Pleistocene assemblages point towards rigorous conditions in at least some phases. These species did not form a timeless "Ice Age fauna"; their presence shifted as climate, vegetation, coastlines and ice cover changed. Ireland was a changing frontier, repeatedly entered, abandoned or made inaccessible by different species.

The environmental record from beneath and between glacial deposits adds a complementary perspective. Organic silts at Derryvree near Maguiresbridge, County Fermanagh, have preserved plant remains, pollen and insects from an earlier Midlandian cold-stage interval. They reveal treeless, waterlogged tundra or muskeg conditions, with pools, sedges, mosses and cold-adapted plants. Those deposits cannot be assigned confidently to the nominal year 31,205 BCE, and their radiocarbon results carry wide uncertainty. Their importance is methodological: they show that beneath later tills, Irish sediments can preserve brief ice-free environmental episodes that would otherwise be erased from view.

What This Date Can Mean

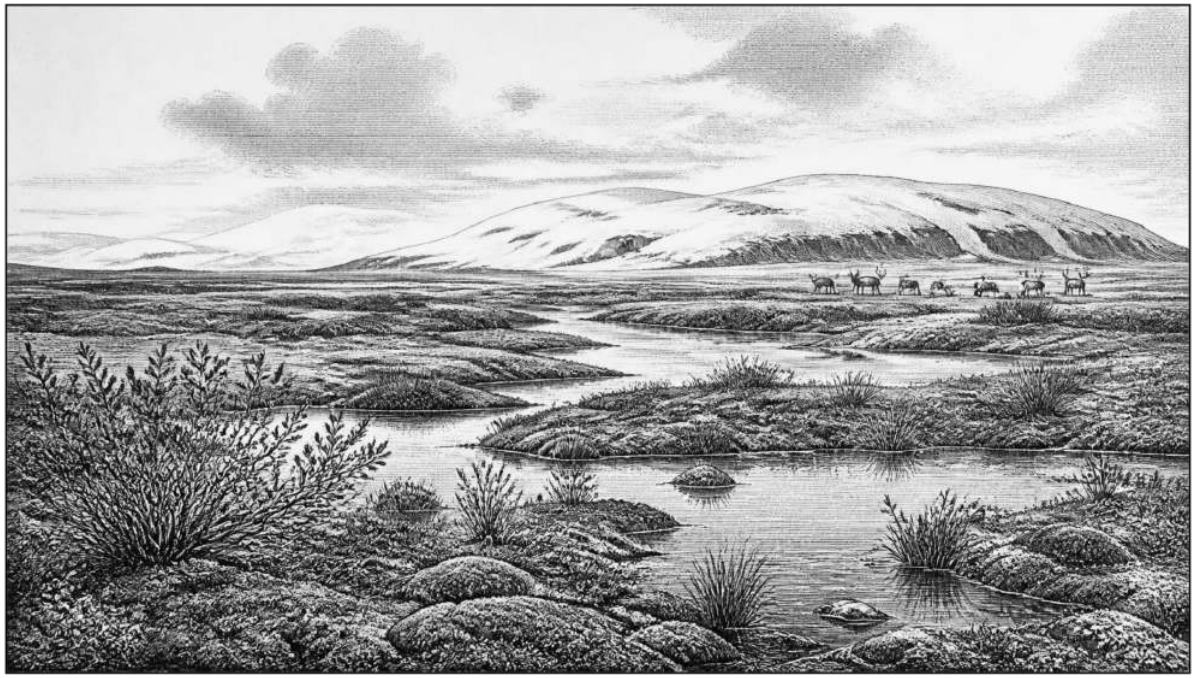
Around the notional date of 31,205 BCE, Ireland belongs to deep environmental history rather than conventional national history. The island had no documented rulers or boundaries; it left no contemporary written account and no demonstrable political narrative. Its most tangible witnesses are cave bones, glacial sediments, plant traces and the physical landscapes later ice reshaped. Castlepook’s reindeer bone is important precisely because it is so slight: a possible human action among overwhelmingly non-human evidence.

The larger development was vulnerability to climatic change. Before the Last Glacial Maximum transformed Ireland again, limited habitats could support animals and perhaps occasional people. Afterwards, expanding ice removed or buried much of that record. The scarcity of evidence should therefore not be mistaken for an empty past. It is the expected result of an exposed island at the edge of the North Atlantic, repeatedly altered by ice, water and time. For this year, the most honest history is one of open cold landscapes, mobile animals, uncertain human contact and a surviving cave bone that still asks more questions than it answers.

Chapter 097 of 100

31204 BCE

Bogbean Under the Drumlin [97]



Time Beyond a Calendar

The label 31,204 BCE is useful only as a modern point on a very long timescale. It cannot identify an Irish year in the historical sense: no calendar, written testimony, named community or dated event survives from this depth of prehistory. In the conventional system that counts years before AD 1950, it lies roughly 33,150 calendar years before present, during the Late Pleistocene and Marine Isotope Stage 3. Even that conversion must not imply false precision. Radiocarbon determinations from this age need calibration, have substantial statistical ranges, and usually date an organism’s death or the formation of a deposit rather than an episode that can be fixed to a season, generation or numbered year.

The most relevant Irish evidence is therefore environmental and palaeontological rather than historical. It comes chiefly from a rare organic deposit at Derryvree, near Maguiresbridge in County Fermanagh, and from the rich but complicated bone assemblage in Castlepook Cave near Doneraile, County Cork. Together they show that Ireland was not simply an empty, uniformly ice-covered place before the Last Glacial Maximum. They do not provide a narrative of a particular year, nor do they demonstrate a permanent human population.

A Wetland Between Ice Advances

Derryvree is the closest important archive to this date. Road works in 1969 cut through a drumlin and exposed fine sands, silts and organic mud between two tills: unsorted material laid down directly by glacier ice. The sequence matters more than any single measurement. The lower till records an earlier

incursion of ice. Above it, freshwater and wet-ground sediments accumulated during a locally ice-free interval. A later advance then sealed the wetland below another till. That burial preserved a small fragment of a landscape which later glaciation otherwise heavily reworked or destroyed.

The key determination, BIRM-166, gave an age of about 30,500 radiocarbon years BP, with an uncertainty of around 1,100 years. Published calibration and later regional modelling place the Derryvree evidence broadly within late MIS 3, with estimates spanning roughly 36,900–31,700 calibrated years BP and a modelled central age around 33,500 years ago. The modern date 31,204 BCE falls inside that broad frame. It cannot be assigned to a particular layer, plant, animal or moment within the deposit. This distinction is essential: Derryvree illuminates conditions over a long interval, not a single day in an ancient Irish calendar.

Treeless Water and Frozen Ground

The plant and invertebrate evidence from Derryvree indicates an open, treeless tundra or muskeg landscape under periglacial conditions. Mosses, sedges, dwarf willow, clubmoss and aquatic or wetland plants, including bogbean, point to pools, saturated ground and shallow freshwater amid cold open country. The evidence is not for a modern Irish bog, still less for a forested countryside. It represents a harsh but living mosaic: standing water and reed-fringed hollows, damp ground in sheltered places, sparse herb-rich surfaces and soils repeatedly affected by freezing and thawing.

Such a landscape would have changed strongly with season and with longer climatic oscillations. Winter cold, snow cover, frost-shattered ground and short growing seasons probably constrained plant productivity, while the summer thaw created wet patches capable of supporting insects, small animals and grazing mammals. The record demonstrates that conditions in at least part of Fermanagh could support freshwater life during this interval. It does not prove that every region of Ireland had the same climate or vegetation. Ireland’s relief, proximity to changing ice margins and the influence of the Atlantic ensured marked regional variation.

The Castlepook Animal World

Far to the south, Castlepook Cave preserves evidence for a broader Late Pleistocene fauna. Its collections include remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, mountain hare, stoat, Arctic and Norway lemmings, and spotted hyaena. This assemblage is among the most important indications that cold-stage Ireland could be reached by large grazing animals, carnivores and scavengers. Reindeer and lemmings fit well with open cold habitats; mammoth and giant deer imply that, at least at some times, there were extensive enough feeding grounds to support large herbivores.

Yet Castlepook must be read cautiously. It is a cave archive, not a neatly sealed snapshot of one local ecosystem. Animals may have died in fissures, carnivores may have dragged bones underground, water may have moved material, and deposits were disturbed by both natural processes and early excavations. The bones also derive from more than one episode over a long span. A species represented in the cave was present in Pleistocene Ireland at some point; this does not establish that all listed species encountered one another, nor that they occupied the Doneraile landscape in 31,204 BCE.

The cave’s spotted hyaena remains are particularly revealing. Hyaenas could accumulate bone in dens and scavenge carcasses left by other predators, disease, accident or human activity. Their presence should not be turned into a dramatic scene of constant pursuit. It does, however, confirm that Ireland’s late-

Pleistocene food webs sometimes included powerful carnivores as well as large herbivores. The country was ecologically connected to the wider north-west European world, although the exact routes, timing and frequency of animal movement remain debated.

A Possible Human Trace

One Castlepook object bears directly on the question of people: a reindeer femur fragment with a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during butchery. The bone has been publicly described as about 33,000 years old and County Cork heritage material places it broadly around 31,000 BC. If the mark is confirmed as anthropogenic, it would indicate that people processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for human activity on the island.

That is an important possibility, but not evidence for a settled society. The bone originated in an older cave collection rather than a modern excavation that recovered it with an associated hearth, stone-tool assemblage, floor surface, shelter, repeated refuse deposits or human remains. Its radiocarbon age dates the reindeer, not automatically the mark or the place where the carcass was butchered. Comparative analysis must distinguish cuts from damage caused by carnivores, trampling, sediment movement, weathering and breakage. For now, the responsible conclusion is that a brief human visit or processing episode is plausible, while continuous occupation and colonisation remain unproven.

Society Beyond Recovery

There is no evidence from Ireland at this date for political institutions, diplomacy, territorial leadership, warfare, formal religion, artistic traditions or systems of learning. Nor can archaeology recover family structures, language or beliefs from the Derryvree wetland and Castlepook bones. It would be misleading to supply them by analogy with later peoples. If humans did reach Ireland, they were likely highly mobile hunter-gatherers operating in the wider Upper Palaeolithic world of north-west Europe; that is an interpretation based on contemporary continental evidence, not a demonstrated description of an Irish community.

The same restraint applies to economy and trade. No Irish evidence establishes exchange networks, boats, regular crossings or a durable land route at this time. Lower sea levels changed coastlines and exposed continental-shelf land, but did not necessarily create a simple, permanent dry crossing between Ireland, Britain and mainland Europe. Ice margins and sea routes were dynamic. Animal dispersal and the possible marked reindeer bone show that access was possible at some stage; they do not reveal how often people travelled, what they carried, or whether they returned.

Approaching Greater Glaciation

This interval preceded the Last Glacial Maximum, when the British–Irish Ice Sheet later expanded much more extensively, broadly between about 26,500 and 19,000 years ago. The future ice advance would scour, bury and rearrange large areas of the island, helping explain why so little early evidence survives. Derryvree’s upper till records that return of ice in its own locality. The preserved wetland is therefore doubly valuable: it records a biologically active cold landscape and shows that Ireland’s glacial history was episodic rather than a single uninterrupted freeze.

For 31,204 BCE, then, the clearest Irish story is not of kings, battles or monuments. It is of a cold, open island landscape in flux: freshwater hollows and bogbean beneath Fermanagh’s later drumlins; large mammals and carnivores known from a Cork cave; and a single marked reindeer bone that may mark a fleeting human encounter. The evidence is fragmentary, time-averaged and often uncertain. Properly understood, that uncertainty is not a weakness in Ireland’s deep history, but the central fact of it.

Chapter 098 of 100

31203 BCE

The Doneraile Butchery Question [98]



The label 31,203 BCE is a useful modern waypoint, not a recoverable Irish calendar year. No written record, annual sequence of events or excavated settlement can be fixed to it. In archaeological terms it lies about 33,150 calendar years before the conventional “present” of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a climatically unstable part of the last Ice Age. Radiocarbon measurements from this depth of time require calibration and normally produce ranges rather than a single date; a date on an animal bone tells us when that animal died, not automatically when people arrived or acted. The responsible history of Ireland at this point is therefore a history of changing habitats, animal movements, ice growth and one unusually provocative fragment of bone.

A Landscape Before Full Glaciation

Ireland was not the green, wooded island familiar today. The last British–Irish Ice Sheet was developing, but the island was not yet uniformly covered by ice. Modern reconstructions indicate considerable regional variation around the opening of the final glacial maximum: ice caps and mountain glaciers existed in parts of Ireland, especially in northern and upland areas, while other ground could remain open, seasonally frozen or intermittently ice-free. The later maximum, when ice spread across Ireland and its continental shelf on a far greater scale, belongs chiefly to roughly 27,000–23,000 calibrated years before present. The precise shape of ice margins earlier in the cycle remains debated, which is important: it rules out any simple map showing either an entirely frozen or entirely open Ireland in 31,203 BCE.

Lower global sea level altered the geography as well as the climate. The shores stood farther from their modern positions in many places, and the Irish Sea region was a changing combination of sea, exposed shelf and glacially influenced corridors. That did not create a permanently simple overland route from continental Europe to Ireland. Water crossings, shifting coastlines, ice and harsh terrain all mattered. Yet mammals evidently reached Ireland during favourable intervals, whether by moving through connected or near-connected landscapes, across narrow marine barriers, or along routes that changed as ice and sea level did. For humans, if they were present, access would have been equally contingent and probably episodic.

Cold Ground, Living Water

The clearest environmental evidence for the broader period comes not from a village but from sediments. At Derryvree near Maguiresbridge in County Fermanagh, organic-rich freshwater deposits were preserved between two tills, sheets of glacial sediment laid down at different times. Their pollen, plant macrofossils and insects describe a treeless, cold-climate wetland: sedges and grasses, mosses, dwarf shrubs and herbs around shallow pools and waterlogged ground. This was not a forest landscape, nor an unbroken white desert. It was a patchwork of open tundra-like terrain, wet muskeg, freshwater margins and mineral ground, shaped by severe winters and short growing seasons.

Its chronology is necessarily broad. A radiocarbon determination from the Derryvree organic beds, once calibrated, has been placed approximately within 36,900–31,700 calendar years before present. That range overlaps the general timescale represented by 31,203 BCE, but it does not prove that Derryvree’s pools and every other Irish district looked identical in that particular year. Sediments accumulate over time, pollen can travel, and conditions varied from Fermanagh’s lowlands to the limestone country of Cork. Nevertheless, Derryvree establishes an essential point: before later ice overran or buried parts of the island, some Irish landscapes supported persistent freshwater habitats and cold-adapted vegetation.

The evidence also demonstrates why Ireland’s deep prehistory is so uneven. Advancing glaciers eroded older surfaces; meltwater shifted sediment; rising seas later drowned extensive coastal landscapes. Caves, buried wetland lenses and protected sedimentary basins are therefore disproportionately important. They are not complete samples of the country. Rather, they are rare archives that survived processes which removed much of the evidence that might otherwise record camps, tracks, hunting places or short-lived visits.

Castlepook’s Animal Archive

The most important Irish site for this period is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, in the Awbeg Valley beneath the Ballyhoura Hills. Excavations undertaken in the early twentieth century recovered more than two thousand bones. Subsequent work has shown that the cave contains faunal material from a long span of the late Ice Age, not one neatly sealed moment. Its assemblage includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Castlepook is consequently evidence for repeated animal presence in and around southern Ireland, but it cannot be treated as a census of one local herd, one season or one human occupation.

Spotted hyaena are especially revealing. Their presence shows that Ireland could support, or at least receive, a large scavenging predator within a wider community of grazing and browsing mammals. Hyaenas also complicate the archaeology. They could drag carcass parts into caves, gnaw bones, disturb

deposits and create accumulations that later excavators might mistake for a straightforward record of human hunting. Water movement and old excavation practices added further disturbance. A bone found in Castlepook may retain powerful evidence of an animal's life and death, but its final position in the cave need not be the place where it was killed or consumed.

The animals imply open feeding grounds beyond the cave: enough vegetation for reindeer and giant deer, terrain traversable by mammoth, and prey or carrion for carnivores. They do not justify a picture of a stable 'mammoth steppe' covering every Irish county. Species have different ecological tolerances, and bones from several millennia can occur in the same cave system. The safest interpretation is of a cold, dynamic landscape containing open habitats, wetlands and sheltered limestone terrain, visited by animals as climate, vegetation and access routes changed.

The Reindeer Femur

One object gives 31,203 BCE its particular historical interest: a reindeer femur fragment from Castlepook. Re-examination and improved accelerator radiocarbon methods have placed it broadly around 33,000 years ago in public accounts, while a deep linear modification has been interpreted as a cut mark made by a sharp stone tool. If that interpretation is sustained, the bone would be evidence that a person butchered or otherwise processed reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted post-glacial human record.

That claim must be stated carefully. The radiocarbon result dates the animal bone, not a person. The surface mark requires separate microscopic and taphonomic assessment: cuts made with stone tools need to be distinguished from carnivore damage, trampling, sediment abrasion, excavation damage and other natural alterations. Nor does one potentially modified bone establish a settlement, a resident population, a named culture or a continuous ancestral line to later Irish communities. It cannot tell us whether people killed the reindeer, scavenged it, transported a portion of carcass, or visited the cave itself.

The claim is valuable precisely because it is limited and testable. It encourages renewed excavation in undisturbed parts of Castlepook, direct dating of securely excavated material, study of bone-surface damage and searches for associated stone artefacts, hearths or occupation surfaces. Work at the cave in 2022 was undertaken to determine whether Pleistocene deposits survive beyond the areas disturbed by earlier digging. Such research may strengthen, refine or overturn parts of the current interpretation. At present, the marked femur is a possible trace of human action, not the foundation for an invented Ice Age society.

People Without Polities

There is no evidence from Ireland around this date for political institutions, rulers, territorial states, diplomacy, organised warfare, formal religion, trade networks or literacy. Nor are there securely dated houses, burials, art panels, tool assemblages or camp floors from which to reconstruct everyday social life. It would be misleading to supply chiefs, clans, rituals or battles simply because the period is remote. If people did reach Ireland, they would have been small, mobile Upper Palaeolithic groups accustomed to cold-season risk, animal behaviour and movement across large landscapes; that is an inference from the wider north-west European context, not an Irish settlement record.

Even this cautious possibility changes the questions historians ask. Ireland was once often presented as wholly beyond the human world until after the final retreat of the ice. Castlepook instead suggests that the island may have been visited during an earlier, more hospitable interval of the Ice Age. Such visits

could have been brief and leave almost no durable trace, especially where later glaciers scoured the terrain. Human absence from the present archaeological record is therefore not the same thing as proof that no person ever stood on the island.

What This Date Can Mean

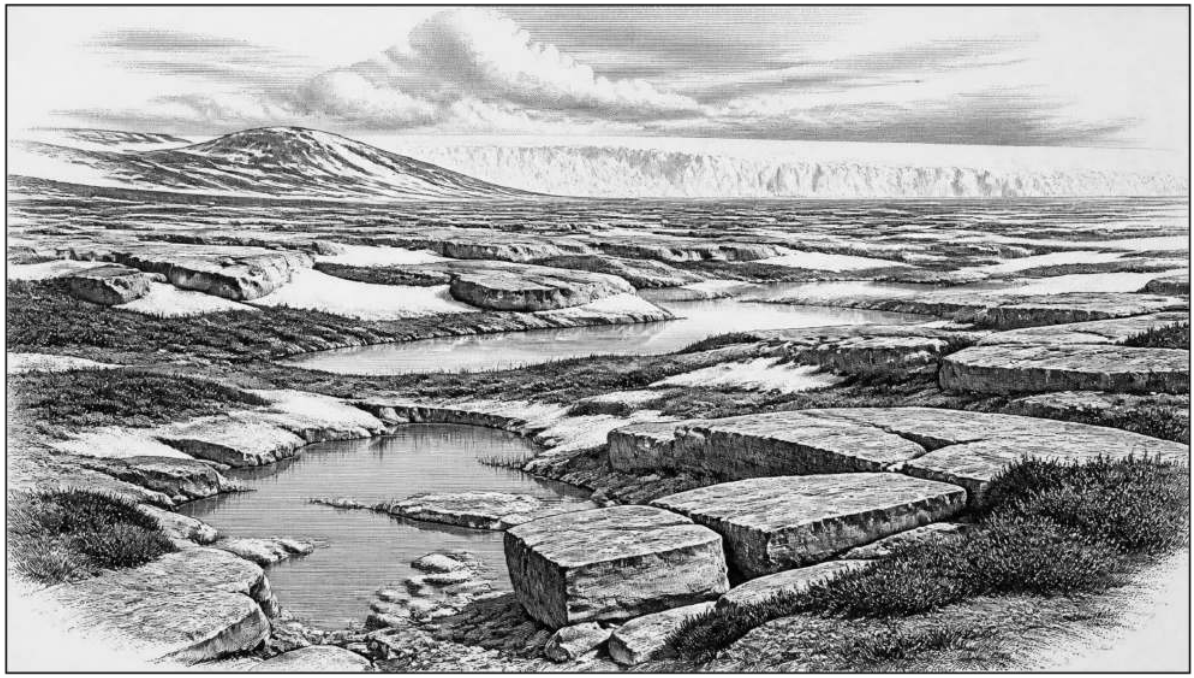
Around the modernly expressed year 31,203 BCE, Ireland was defined less by human history than by environmental opportunity and constraint. Ice was growing but had not yet imposed the later island-wide maximum; cold wetlands and open ground supported a distinctive fauna; caves preserved fragmentary records of animals, predators and perhaps people. Derryvree's buried freshwater sediments provide the best local picture of a tundra wetland, while Castlepook supplies the richest animal archive and the unresolved human question.

The principal development is therefore not a dated event but a revision in perspective. Ireland's deep past cannot yet yield an annual chronicle for this year. It can, however, show a landscape of reindeer and hyaenas, sedge-fringed pools and unstable ice margins, in which a single marked reindeer bone may preserve the faintest known sign of an Upper Palaeolithic encounter. The distinction between what the bone proves, what the cave suggests and what future research may establish is the key to understanding Ireland at this immense distance in time.

Chapter 099 of 100

31202 BCE

Ireland’s Iceward Interval [99]



31,202 BCE is not a year for which Ireland can be described through an event, ruler, battle or settlement. No written calendar existed on the island, and archaeology cannot resolve evidence at anything like modern year-by-year precision this far back. In conventional terms, the label falls at about 33.1 thousand calibrated years before present (cal BP, where “present” is AD 1950), near the close of Marine Isotope Stage 3, a long and climatically unstable phase of the Late Pleistocene. The responsible historical question is therefore not “what happened in Ireland that year?”, but what the surviving geological, fossil and archaeological record can say about Ireland within a broad interval around c. 34,000–32,000 cal BP.

A Date on the Edge of Glaciation

This was an ice-age Ireland, but not necessarily an island already buried beneath the maximum ice cover familiar from later glacial maps. The most recent large reconstruction of the British–Irish Ice Sheet traces its changing margins in thousand-year steps rather than annual ones. It indicates major growth over the period after c. 31,000 years ago, while evidence from the western shelf and from Ireland itself shows that the timing, thickness and extent of early ice were not uniform in every region. By c. 28,000–26,500 cal BP, ice had expanded to the continental-shelf edge in several western sectors; the full ice-sheet maximum came later still, with different margins reaching their greatest positions at different times.

For the interval represented by 31,202 BCE, the best picture is one of transition. Some reconstructions allow comparatively limited or discontinuous Irish ice cover before about 32,000 cal BP, especially away from mountain and marine margins. Other evidence, particularly raised marine deposits and dated shells on the west coast, has been interpreted as requiring substantial ice loading in western Ireland at points between roughly 40,000 and 19,000 cal BP. These are not simply mutually exclusive stories: an ice sheet

can grow, thin, advance and reorganise, while local records preserve different portions of that history. They do mean, however, that a neat map of the island for one notional calendar year would pretend to a certainty the science does not possess.

Cold was the defining political force of this world, if the word “political” can be used at all. It governed where water pooled or froze, where animals could feed, which valleys carried ice, and whether any temporary human party could enter, remain or leave. The landscape was being drawn into the formation of the British–Irish Ice Sheet: a connected but changing complex of Irish, Scottish and marine-based ice masses. Later flow left the drumlins, streamlined bedrock, tills, meltwater channels and moraines that make much of Ireland’s glacial landscape so recognisable today. Yet those visible landforms chiefly record later, stronger phases of glaciation and retreat, not a snapshot of 31,202 BCE.

Reading a Landscape Largely Erased

The record is unusually difficult because later ice was an active geological agent. Glaciers eroded older soils, reworked sediments, transported stones and bones, and covered possible occupation surfaces beneath till or offshore deposits. A lack of evidence for camps, hearths or tools from this interval cannot prove that no person ever crossed part of Ireland; it does show that no secure evidence currently demonstrates a resident human population. This distinction is essential. Absence is not proof of absence, but neither is it a licence to create a prehistoric society from possibility alone.

Ireland’s first securely demonstrated human presence belongs much later, at the end of the last glacial period. Cut marks on a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, have been independently dated to roughly 12,810–12,590 and 12,810–12,685 cal BP. That remarkable find establishes Upper Palaeolithic butchery in Ireland, not occupation twenty millennia earlier. Claims for older Irish Palaeolithic artefacts have generally failed because the objects were naturally fractured, displaced by ice, or lacked reliable archaeological context.

Accordingly, there were no demonstrable Irish chiefs, tribes, territorial kingdoms or diplomatic relationships in 31,202 BCE. There is no evidence from which to infer local languages, kinship systems, dwellings, ritual places, art, teaching or exchange customs. Nor can modern ideas of an Irish nation be projected backwards into a time before any documented human community on the island. The appropriate history here is environmental and evidential: a history of changing habitats, animal movements and the preservation—or destruction—of traces.

The Closing Faunal Window

Caves in southern Ireland, especially Castlepook Cave near Doneraile in County Cork, preserve the most evocative evidence for the preceding and overlapping Pleistocene world. Fossils from Irish caves include woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyena. They demonstrate that, during portions of the Late Pleistocene, Ireland supported or was reached by a varied cold-stage fauna rather than being perpetually a lifeless sheet of ice. The National Museum of Ireland’s collections make the point vividly, but the fossils must be used carefully: an animal bone dates an individual animal or deposit, not an entire landscape, and need not prove that the species lived everywhere on the island at the same time.

The caution matters acutely at this date. A reassessment of radiocarbon evidence from southern Irish cave fauna concluded that some apparently late Marine Isotope Stage 3 ages were misleadingly young, and suggested that giant deer and spotted hyena may have vanished locally before about 40,000 cal BP.

Thus, hyenas or giant deer should not be placed confidently in an Irish scene for 31,202 BCE merely because their bones occur in an Irish cave. Mammoth and other animals are likewise evidence for a broader pre-maximum faunal window, not a roll call for a single year.

The environment was probably open, cold and highly seasonal wherever land was not ice-covered: a mosaic of sparse grassland, herb-rich tundra, wet hollows, exposed mineral ground and, locally, snowbeds or glacier margins. Extensive closed woodland is unlikely in such conditions. But even this description is a regional inference assembled from fossils, sediments, pollen and comparison with north-west European climatic records; direct Irish plant archives of this age are rare and unevenly preserved. It is more responsible to envisage shifting habitats than a uniform “mammoth-steppe Ireland”.

Sea, Land and Movement

Sea level was much lower than today during the wider glacial period because enormous volumes of water were stored in land ice. The coastline was therefore not the familiar modern outline: broad shelves now beneath the Atlantic, Celtic Sea and Irish Sea may have been exposed or shallower at different times. Yet lower sea level does not automatically establish a simple land bridge between Ireland, Britain and continental Europe. Deep basins, changing ice margins, local uplift and depression under the weight of ice, and poorly preserved offshore terrain complicate the matter. A route usable by animals or people at one time may have been blocked by water, ice or severe terrain at another.

That uncertainty limits what can be said about migration and trade. Animals clearly reached Ireland in earlier Pleistocene intervals, but their routes may have involved exposed ground, seasonal ice, short water crossings or combinations of these. There is no evidence for commerce, imported objects or organised long-distance exchange at 31,202 BCE. “Connection” in this context means ecological connectivity: the intermittent possibility that plants and animals moved across a changing north-west European geography.

Conflict Without Armies

Conflict, too, must be understood in ecological rather than military terms. Predators, scavengers and herbivores competed for food and shelter; freezing temperatures, snow cover, unstable ground and advancing ice reduced the places in which life could persist. Carnivore-modified bone, cave deposits and fossil associations can illuminate such food webs, but they do not record human hunting parties or battles. Even apparent cut marks demand specialist scrutiny, since trampling, excavation damage, geological abrasion and carnivore teeth can imitate purposeful incision.

The larger development was the narrowing of habitable opportunities. As the British–Irish Ice Sheet gathered strength, its advance did more than cool Ireland. It repeatedly removed soils, altered drainage, shifted coastlines and destroyed many of the contexts in which delicate human and animal traces might have survived. The scarcity of the record is therefore part of the history: later glaciation made earlier Ireland difficult to recover.

What Can Be Said Responsibly

Around the broad interval indicated by 31,202 BCE, Ireland stood near a threshold. It was part of a cold north-west European world undergoing rapid environmental change, with expanding ice and increasingly restricted refuges. Fossils show that substantial mammals had used Ireland during the wider

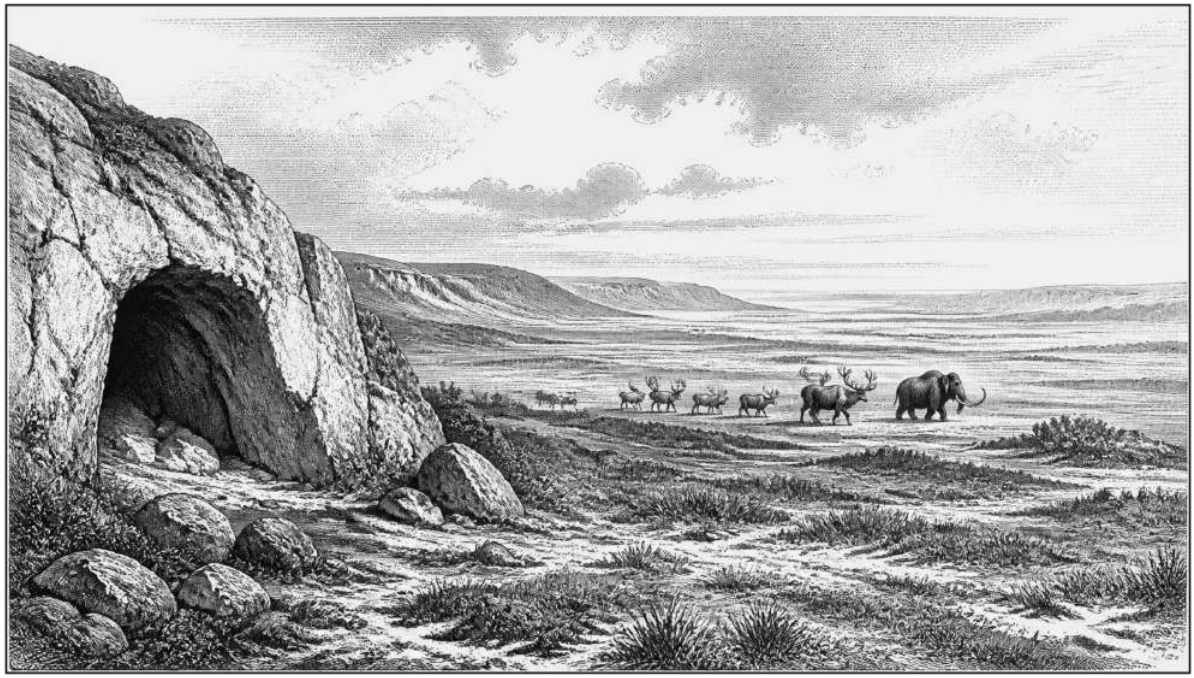
pre-Last Glacial Maximum period, but revised dating warns against assigning particular species to this exact moment. The archaeological record provides no secure basis for describing inhabitants, government, religion, learning or economy.

This is not an empty chapter. It is the precondition for every later chapter of Irish history. The ice advance that followed reshaped the ground on which Mesolithic camps, Neolithic tombs, medieval lordships and modern towns would later stand. Its erosion also explains why the island’s deep human past is more elusive than that of many neighbouring regions. For 31,202 BCE, the honest conclusion is not a story of named people and dated deeds, but a scientifically bounded one: Ireland was entering a decisive glacial transformation, and the evidence survives in fragments measured in millennia, not years.

Chapter 100 of 100

31201 BCE

Castlepook’s Open-Country Fauna [100]



31,201 BCE is not a date at which Ireland can be described year by year. No community on the island kept a calendar, and no archaeological deposit can be assigned responsibly to this single modern calendar year. The label is a backwards conversion, placing the point about 33,150 years before AD 1950. At this depth of time, radiocarbon dates must be calibrated and normally produce probability ranges rather than anniversaries; revised calibration curves and changing interpretations of cave deposits can alter the chronological picture. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, broadly around 34,000–32,000 calibrated years ago, not an event on a particular day or in a particular season.

A Changing Ice-Age Ireland

Ireland then stood within the Last Glacial Period, but not yet at the fullest extent of the last British–Irish Ice Sheet. The later maximum is generally reconstructed between about 27,000 and 24,000 years ago, although its growth, margins and timing varied greatly from one sector to another. Modelling and geological evidence indicate that ice masses were already developing across the Irish and British uplands by roughly 31,000 years ago, coalescing rapidly thereafter. For a point somewhat earlier than that, such as 31,201 BCE, the exact distribution of ice, open ground and coastal water around Ireland remains uncertain. It would be wrong to picture the whole island either as a uniform white ice cap or as an unbroken habitable plain.

What is secure is that the landscape was cold, treeless in many exposed places and ecologically mobile. Temperatures and precipitation did not remain steady: Greenland ice cores show abrupt northern climatic oscillations during the last glacial period, while Irish evidence records the local consequences only unevenly. Vegetation, animal ranges, snow cover, permafrost and the availability of sheltered ground

could all alter over centuries or less. The coasts were also unlike those of modern Ireland because global sea level was substantially lower, while local land levels were affected by the growing weight of ice. Yet lower sea level does not license a simple claim of a permanent land bridge to Britain. The geography of the Irish Sea and North Channel was changing, and the practical routes available to animals or people are still reconstructed from incomplete terrestrial and marine evidence.

Castlepook’s Uneven Archive

The most illuminating Irish place for this broad interval is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. It is not a settlement site in the ordinary sense. Rather, it is a limestone cave system whose deposits and old collections preserve an exceptional, though disturbed, record of Pleistocene vertebrates. Excavations by Richard J. Ussher and others in the early twentieth century removed large quantities of material; later reassessment, radiocarbon dating and renewed fieldwork have made the cave central to the study of Ireland before the Last Glacial Maximum. Geological Survey Ireland calls it the country’s richest site for vertebrate fauna leading up to that maximum.

Its animal assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf and spotted hyena, alongside smaller cold-adapted mammals such as lemmings and Arctic fox in later Ice-Age material. This is powerful evidence that Ireland, or at least accessible parts of it during favourable intervals, supported a far more varied mammalian community than the island possesses today. It is also evidence of ecological connections beyond Ireland. Mammals of this kind did not evolve independently in Cork: their presence reflects movements within north-west European environments whose coastlines, ice barriers and open habitats were repeatedly rearranged by climate.

But a cave bone-bed is not a census taken in one year. Carnivores may have dragged prey or carrion underground; water could move bones; excavation methods a century ago did not meet modern standards; and specimens from different galleries, layers and millennia can end up discussed together as “the Castlepook fauna”. Spotted hyena behaviour is particularly important, since a den or scavenging place can assemble a selective collection of bones. The cave therefore reveals that these species occurred in the wider regional world, but it cannot prove that mammoth, hyena, reindeer and people stood together outside its entrance in 31,201 BCE.

Reindeer and the Human Question

A reindeer femur from Castlepook has given this period special public prominence. County Cork heritage material dates it approximately to 31,000 BC and identifies a mark interpreted by zoologist Ruth Carden as having been made by a sharp stone tool during butchery. If that interpretation is sustained by further analysis, it would be evidence for a brief Upper Palaeolithic human presence in Ireland far earlier than the long-accepted terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare. It would suggest that one or more people handled a reindeer carcass, not that they founded a village, controlled a territory or formed a continuous population.

The distinction matters. Ireland has no securely dated stone-tool assemblage, hearth, dwelling floor, human skeleton, burial, cave art or settlement plan from around this point in the early thirty-second millennium BCE. Nor does Castlepook presently provide a demonstrable hunting camp. A cut or chop mark on one bone, however suggestive, is evidence of a particular action only if its human origin and its association with the animal’s death are accepted. It cannot supply the language, identity, kinship rules,

beliefs or political organisation of the people who may have made it. The most cautious conclusion is that Castlepook preserves a serious possibility of fleeting human activity amid a richer and better-established animal record.

This caution is strengthened by the cave's dating history. Earlier radiocarbon programmes placed several Castlepook animals in the broad range of roughly 33,000–38,000 radiocarbon years before present. A 2020 reassessment found that some of the southern Irish Marine Isotope Stage 3 fauna were older in calibrated calendar terms than had formerly been supposed, and argued that giant deer and spotted hyena may have disappeared locally before about 40,000 calibrated years ago. Consequently, "around 31,201 BCE" is a useful editorial waypoint, not a claim that every relevant Castlepook specimen belongs in that calendar decade.

Life Without a Recorded Society

Political affairs, warfare and diplomacy cannot be recovered for Ireland at this date. There were no states, kingdoms, written agreements or named leaders, and there is no basis for projecting later Irish peoples or traditions backwards into this Ice-Age setting. If humans visited, they were almost certainly part of small, mobile Upper Palaeolithic foraging groups operating at the far western edge of wider European networks. That is an inference from the probable nature of the evidence and from contemporary European archaeology, not a demonstrated Irish social map.

Everyday life is similarly difficult to reconstruct. A successful party in open, cold country would have needed close knowledge of animal movement, weather, shelter, fire and stone-working, but no Irish hearth or toolkit of this age has yet established those practices locally. Reindeer could have provided meat, hide, sinew, bone and antler; such possibilities explain why a butchered reindeer bone is important, but they must not be mistaken for direct evidence of clothing, tents or specialised hunting equipment in Cork. Mammoth and giant deer bones indicate impressive animals in the regional fauna, not necessarily human prey.

There is no Irish evidence for religion, formal ritual, artistic production, teaching institutions or long-distance trade at this date. Upper Palaeolithic communities elsewhere in Europe created sophisticated tools and symbolic works, but Castlepook has yielded no securely contemporary equivalent. Nor can trade be inferred merely because animals crossed changing landscapes. The central cultural fact for Ireland is absence: the island's subsequent glaciation, erosion, acidic soils and rising seas have destroyed, buried or submerged much of the evidence that might once have survived.

An Ecological Frontier

Economy, insofar as the term can be used here, was ecological rather than agricultural. There were no farms, fields, livestock, cereal crops, permanent towns or mines. The available evidence points instead to an open-country food web in which grazing and browsing mammals, predators, scavengers and small cold-adapted animals occupied shifting patches of grassland, herb-rich tundra, wet ground and sheltered terrain. Reindeer and lemmings point towards cold conditions; hyena, mammoth and giant deer demonstrate that the environment cannot be reduced to a featureless polar desert.

Regional change is the great historical development. Ireland was approaching a phase in which expanding ice would overwhelm or isolate much of its available habitat. The faunal evidence from Castlepook records a world before that later climax: a world capable of sustaining large mammals, and perhaps admitting occasional people, but vulnerable to rapid environmental transformation. The cave's

importance lies not in offering a finished origin story for Ireland’s population. It instead preserves fragments of a frontier landscape, where animal movement is demonstrable, human presence remains possible but sparse, and the coming ice would make the record still harder to read.



About the Author

Gerard J. Hannan is an Irish author, historian, journalist and broadcaster with a lifelong interest in the people, places and events that have shaped Ireland’s past. Based in Limerick, he spent more than twenty-five years working in journalism and broadcasting, developing a particular interest in local history, social change and the preservation of historical memory.

He is the founder and curator of Emerald Archives, an expanding digital historical collection dedicated to preserving, restoring and sharing material connected with Ireland’s social, cultural and political history. Through the archive and its associated publishing projects, he aims to make historical information accessible to both general readers and serious researchers.

Hannan holds a BA in History and Media, a Master of Business Studies in International Entrepreneurship Management, and an MA in Teaching English to Speakers of Other Languages. His academic background complements decades of practical experience in writing, research, broadcasting and historical documentation.

He is also the author of several books and long-form historical projects exploring Irish life, identity and memory. As creator of Emerald Gazette, Hannan continues to develop a growing chronological collection designed to bring Ireland’s extraordinary historical record to a broad international readership.

Endnotes

1. Chapter 001 — Derryvree's Silt Flora (31300 BCE). Sources: References 2, 19, 38–39, 107, 144, 148–149, 163, 173, 205, 234, 245, 249, 251, 258, 312, 320, 330, 382–383, 390.

2. Chapter 002 — BIRM-166's Mossland Basin (31299 BCE). Sources: References 3, 20, 39, 88, 107, 148, 173, 185, 187, 205, 213, 245, 256, 278, 286, 324, 339, 356, 375, 384, 390, 405, 427, 433.

3. Chapter 003 — Castlepook's Hyena Horizon (31298 BCE). Sources: References 3, 31–32, 40, 69, 97, 150, 164, 183, 208, 220, 232, 258, 278, 313, 328, 335, 388, 391, 405, 408, 434.

4. Chapter 004 — Fermanagh's Mountain-Avens Bed (31297 BCE). Sources: References 3, 20, 38, 98, 118, 148, 151, 173, 193, 214, 258, 268, 278, 290, 322, 333, 335, 374, 392, 435.

5. Chapter 005 — Derryvree's Periglacial Seedbank (31296 BCE). Sources: References 3, 40, 67–69, 89, 99, 107, 145, 148, 163, 213, 221, 245, 249, 292, 335, 357, 375, 378, 383, 390, 405, 416.

6. Chapter 006 — Doneraile's Hyena Country (31295 BCE). Sources: References 3, 20, 44, 69, 100, 142, 148, 173, 201, 258, 278, 285, 290, 310, 316–317, 320, 332, 335, 350, 384, 392.

7. Chapter 007 — Doneraile's Palaeolithic Question (31294 BCE). Sources: References 3, 39–40, 69, 73, 131, 149, 163, 173, 258, 281, 287, 292, 307, 335, 339, 369, 388, 393, 416, 427, 433.

8. Chapter 008 — Fermanagh's Ice-Free Window (31293 BCE). Sources: References 3, 40, 73, 97, 163, 165, 220, 233, 258, 261, 267, 269, 278, 290, 311, 322, 328, 335, 370, 390, 405, 416, 433.

9. Chapter 009 — Doneraile's Ice-Age Femur (31292 BCE). Sources: References 3, 20, 39, 41, 45, 89, 97, 119, 148, 152, 163, 173, 194, 232, 258, 278, 291, 339, 384, 392, 409, 435.

10. Chapter 010 — Fermanagh's Sedge Marsh (31291 BCE). Sources: References 3, 29, 42, 69, 97, 111, 176, 194, 220, 232, 247, 251, 258, 261, 278, 290, 335, 339, 368, 391, 433.

11. Chapter 011 — Derryvree Beneath Renewed Ice (31290 BCE). Sources: References 3, 19, 38, 40, 45, 65, 69, 120, 148, 163, 182, 187, 236, 245, 258, 290, 335, 369–370, 391, 402, 416, 427, 434.

12. Chapter 012 — BIRM-166's Sedge Waters (31289 BCE). Sources: References 20, 41, 86, 101, 116, 120, 148, 152, 156, 173, 222–223, 248, 258, 278, 384, 391, 396, 401, 405.

13. Chapter 013 — The Doneraile Reindeer Line (31288 BCE). Sources: References 3, 20, 32, 39, 41, 44, 69, 74, 119, 152, 163, 203, 235, 258, 282, 287, 293, 362, 392, 405, 409, 438.

14. Chapter 014 — Derryvree's Middle Midlandian (31287 BCE). Sources: References 19, 38, 41, 82, 88, 91, 112, 146, 158, 163, 184, 187, 198, 235, 251, 258, 278, 306, 384, 391, 405, 428, 435.

15. Chapter 015 — Castlepook's Hyena Coprolites (31286 BCE). Sources: References 3, 20, 41, 44, 69–70, 111, 120, 132, 148–149, 163, 195, 235, 258, 282, 297, 328, 335, 384, 391, 408.

16. Chapter 016 — Cork Cave Reindeer Femur (31285 BCE). Sources: References 3, 13, 38–39, 41, 44, 74, 115, 152, 173, 215, 220, 258, 303, 339, 347, 363, 384, 392, 396, 405.

17. Chapter 017 — Maguirebridge's Intertill Calendar (31284 BCE). Sources: References 3, 20, 38, 41, 59, 71, 100, 152, 163, 180, 192–194, 222, 258, 270, 278, 289, 335, 358, 384, 392, 428, 435.

18. Chapter 018 — Derryvree's Buried Herbarium (31283 BCE). Sources: References 3, 20, 41, 58, 116, 133, 163, 173–174, 187, 193–194, 258, 278, 287, 335, 351, 384, 390, 394.

19. Chapter 019 — Fermanagh Silt, Cork Bone (31282 BCE). Sources: References 3, 10, 20, 44, 144, 148, 163, 173, 187–188, 221, 240, 258, 278, 310, 314, 335, 384, 392, 402, 405, 435.

20. Chapter 020 — Derryvree's Ancient Bogbean (31281 BCE). Sources: References 3, 21, 38–39, 41, 58, 72, 97, 107, 148, 153, 157, 163, 173, 193, 245, 258, 278, 298, 328, 385, 390, 408, 433.

21. Chapter 021 — Castlepook's Vanishing Reindeer (31280 BCE). Sources: References 10, 17, 41, 44, 69, 82, 91, 100, 146, 152, 163, 215, 222, 284, 336, 351, 369, 384, 418, 427.

22. Chapter 022 — Castlepook's Human Question (31279 BCE). Sources: References 3, 11, 42, 45, 69, 89, 97, 107, 128, 148, 166, 173, 205, 245, 251, 258, 282, 311, 315, 322, 364, 390, 394, 408.

23. Chapter 023 — Cork's Reindeer Window (31278 BCE). Sources: References 3, 20, 38, 41, 69, 148, 152, 163, 229, 240, 258, 289, 314, 335, 340, 350, 368, 370, 392, 405.

24. Chapter 024 — Derryvree's Silted Pond (31277 BCE). Sources: References 19, 97, 111, 145, 148, 162, 177, 220, 236, 241, 258, 278, 282, 292, 303, 313, 339, 391, 394, 405, 408, 427.

25. Chapter 025 — BIRM-166's Dwarf Willow (31276 BCE). Sources: References 22, 42, 63, 67, 92, 97, 107, 116, 148–149, 165–166, 173, 245, 249, 251, 258, 278, 311, 341, 390, 433.

26. Chapter 026 — Castlepook's Reindeer Margin (31275 BCE). Sources: References 3, 6, 24, 38, 41, 86, 152, 163, 173, 193, 222, 232, 237, 258, 261, 290, 300, 321, 323, 371, 391–392, 427, 435.

27. Chapter 027 — Castlepook's Closing Corridor (31274 BCE). Sources: References 3, 38, 41, 100, 113, 127, 140, 152, 162, 173, 187, 252, 258, 276, 278, 282, 293, 311, 335, 384, 392, 406.

28. Chapter 028 — BIRM-166's Organic Bed (31273 BCE). Sources: References 12, 20, 30, 41, 52, 91, 119, 133, 148, 163, 173, 222, 248, 260, 294, 314, 322, 339, 359, 370, 391, 435.

29. Chapter 029 — Derryvree's Open Pools (31272 BCE). Sources: References 3, 28, 42, 46, 59, 69, 149, 157, 167, 173, 205, 228, 248, 260, 278, 335, 372, 385, 390, 402.

30. Chapter 030 — Derryvree's Arctic Waterline (31271 BCE). Sources: References 14, 39, 42, 56–58, 97, 148, 168, 171, 173, 258, 269, 278, 294, 298, 385, 391, 410, 415–416, 433.

31. Chapter 031 — Doneraile's Single Cutmark (31270 BCE). Sources: References 38, 41, 45, 91, 152, 163, 173, 183, 216, 232, 244, 258, 278, 284, 290, 334, 339, 358, 369, 384, 392, 413, 429.

32. Chapter 032 — Derryvree's Open-Pool Tundra (31269 BCE). Sources: References 3, 19–20, 51, 62, 64, 119–120, 133, 148, 163, 173, 193, 195, 215, 232, 235, 248, 278–279, 335, 350, 398, 435.

33. Chapter 033 — Mammoth Cave's Reindeer Mark (31268 BCE). Sources: References 3, 41, 144, 146, 152, 163, 173, 222, 235, 248, 258, 261, 282, 314, 347, 372, 375, 384, 390, 435.

34. Chapter 034 — Derryvree's Moss Macrofossils (31267 BCE). Sources: References 3, 36, 38, 67, 69–70, 97, 107, 113, 162, 173, 187, 193, 205, 236, 245, 258, 278, 308, 312, 335, 370, 377, 390, 405, 433.

35. Chapter 035 — Maguirebridge's Silt Lens (31266 BCE). Sources: References 3, 19, 42, 47, 69, 92, 97, 116, 189–190, 209, 223, 241, 259, 278, 341, 370, 386, 391, 427, 430, 433.

36. Chapter 036 — Derryvree Before the Till (31265 BCE). Sources: References 39, 59, 89, 148, 167, 173, 190, 193, 205, 219, 245, 251, 260, 266, 322, 388, 391, 408, 421, 433.

37. Chapter 037 — Ballyhoura Reindeer Carcass (31264 BCE). Sources: References 3, 20, 38, 69, 75, 100, 116, 127, 133, 148, 156, 173, 215, 222, 238, 260, 270, 278, 384, 392, 405, 419.

38. Chapter 038 — Castlepook's Cutmark Debate (31263 BCE). Sources: References 20, 41, 87, 116, 125, 148, 156, 163, 173, 199, 220, 242, 248, 260–261, 278, 295, 306, 385, 390.

39. Chapter 039 — Derryvree's Freshwater Silt (31262 BCE). Sources: References 19, 27, 37–38, 40, 134–135, 148, 153, 163, 173, 187, 258, 358, 379, 385, 390–391, 395, 414–415, 433, 437.

40. Chapter 040 — Maguirebridge's Frostwater Flora (31261 BCE). Sources: References 2–3, 19, 34, 42, 44, 69, 74, 148, 150, 161–162, 183, 215, 235, 253, 258, 261, 278, 352, 384, 392.

41. Chapter 041 — BIRM-166's Mossy Reedbed (31260 BCE). Sources: References 3, 20, 41, 52, 60, 70, 148, 163, 180, 195, 222, 229, 235, 245, 248, 250, 278, 284, 314, 335, 392, 441.

42. Chapter 042 — Castlepook's Reindeer Landscape (31259 BCE). Sources: References 3, 19, 38, 42, 69, 102, 113, 149, 193, 217, 260, 283, 296, 325, 335, 343, 391, 405, 433, 440.

43. Chapter 043 — BIRM-166's Fermanagh Wetland (31258 BCE). Sources: References 3, 20, 40, 61–62, 69, 92, 97, 120, 148, 173, 180, 223, 248, 260, 263, 292, 322, 334–335, 390, 433, 445.

44. Chapter 044 — Maguirebridge's Ice-Free Waters (31257 BCE). Sources: References 3, 20, 69–70, 76, 132, 148, 163, 177, 183, 190, 228, 232, 261, 290, 299, 335, 367, 384, 388, 390, 435.

45. Chapter 045 — Derryvree's Winter Wetland (31256 BCE). Sources: References 20, 38, 41, 99, 117, 144, 148, 156, 177, 180, 205, 222, 248, 284, 290, 292, 336, 375, 384, 392.

46. Chapter 046 — Derryvree's Two-Till Archive (31255 BCE). Sources: References 20, 39–40, 67, 79, 107, 116, 121, 131, 149, 162, 173, 213, 245, 249, 258, 267, 278, 330, 335, 384, 390, 408, 416.

47. Chapter 047 — A Bogbean Seed at Derryvree (31254 BCE). Sources: References 3, 18, 41, 66, 69, 94, 107, 148, 161, 189, 194, 205, 236, 245–246, 251, 260–261, 273, 308, 367, 388, 392, 442.

48. Chapter 048 — Aghnadarragh Beetle Assemblage (31253 BCE). Sources: References 38, 41, 49, 59, 66, 149, 156, 163, 173, 187, 206, 230, 232, 248, 258, 278, 282, 292, 316, 380, 384, 390, 412.

49. Chapter 049 — Castlepook's Palaeolithic Prospect (31252 BCE). Sources: References 42, 87, 99, 143, 148, 152, 173, 212, 215, 223, 231, 235, 258, 282, 310, 326, 384, 391, 399, 403, 405, 433.

50. Chapter 050 — Castlepook's Reindeer Scar (31251 BCE). Sources: References 3–4, 42, 74, 132, 148–150, 163, 173, 258, 261, 270, 278, 282, 350, 367, 388, 392, 416.

51. Chapter 051 — Derryvree and the Reindeer (31250 BCE). Sources: References 3, 19, 38, 42, 76, 97, 120, 173, 178, 181, 260, 264, 297, 344, 381, 385, 391, 407, 416, 431.

52. Chapter 052 — Crag Cave's Thaw Pulses (31249 BCE). Sources: References 20, 38, 42, 55, 120, 148–149, 162–163, 173, 260–261, 278, 292, 334–335, 351, 387, 391, 394, 408, 422.

53. Chapter 053 — Derryvree's Trifoliate Record (31248 BCE). Sources: References 20, 35, 87, 97, 111, 137, 148–149, 164, 173, 190, 212, 236, 245, 259, 278, 311, 313–314, 391, 405, 433.

54. Chapter 054 — BIRM-166's Radiocarbon Interval (31247 BCE). Sources: References 3, 20, 41, 69, 71, 112, 148, 152, 163, 187, 190, 207, 258, 261, 263, 278, 282, 332–333, 339, 384, 392, 418, 435.

55. Chapter 055 — Derryvree's Muskeg Horizon (31246 BCE). Sources: References 3, 20, 38, 41, 94, 100, 148, 163, 173, 235, 258, 278, 282, 287, 311, 353, 392, 405, 415, 443.

56. Chapter 056 — The Castlepook Reindeer Fragment (31245 BCE). Sources: References 3, 15, 38, 41, 69, 103, 148, 152, 156, 162, 258, 280, 292, 307, 384, 392, 394, 405, 409, 435.

57. Chapter 057 — Fermanagh's Buried Pond (31244 BCE). Sources: References 19, 26, 40, 97, 120, 148, 163, 173, 213, 220, 256, 265, 301, 304, 319, 334, 336, 384, 390, 433.

58. Chapter 058 — Crag Cave's Thawwater (31243 BCE). Sources: References 32, 41, 60, 119, 148, 152, 163, 173, 186, 190, 192, 195, 258, 278, 289, 334, 350, 384, 392, 418.

59. Chapter 059 — Hyenahall's Open Range (31242 BCE). Sources: References 3, 20, 32, 38–39, 41, 44, 60, 69, 152, 156, 163, 173, 222, 258, 261, 287, 335, 369, 384, 392, 400, 405.

60. Chapter 060 — Derryvree's Water-Milfoil Basin (31241 BCE). Sources: References 1, 20, 43, 68, 72, 80, 107, 148–149, 167, 209, 249, 260, 278, 282, 287, 314, 319, 352, 390.

61. Chapter 061 — Maguirebridge's Tundra Waters (31240 BCE). Sources: References 3, 20, 38, 41, 64, 69, 81, 112, 129, 144, 148, 163, 173, 254, 258, 278, 282, 305, 337–338, 369–370, 392, 405.

62. Chapter 062 — Fermanagh–Cork Window (31239 BCE). Sources: References 3, 39, 42, 89, 99, 141, 148–149, 161, 196, 220, 236, 258, 302–303, 384, 391, 402, 408, 434.

63. Chapter 063 — BIRM-166's Long Interval (31238 BCE). Sources: References 19, 41, 69, 97, 132, 148, 157, 165, 173, 220, 248, 258, 261, 290, 370, 384, 391, 394, 408, 433.

64. Chapter 064 — Mammoth Cave's Uncertain Passage (31237 BCE). Sources: References 3, 15, 39, 42, 45, 99, 148, 153, 173, 205, 223, 258, 287, 320, 334, 357, 367, 385, 391, 426.

65. Chapter 065 — Bogbean Between the Drumlins (31236 BCE). Sources: References 3, 19, 38–39, 41, 67, 83, 107, 111, 133, 140, 148, 152, 163, 173, 187, 244–245, 251, 258, 278, 282, 294, 339, 348, 385, 390, 435.

66. Chapter 066 — Derryvree's Intertill Fen (31235 BCE). Sources: References 3, 8, 20, 38, 41, 71, 104, 163, 173, 195, 222, 258, 278, 340, 350, 358, 370, 376, 384, 391, 418, 428.

67. Chapter 067 — Derryvree's Organic Interlude (31234 BCE). Sources: References 3, 20, 38–39, 41, 67–68, 77, 90, 107, 116, 133, 144, 148, 163, 173, 245, 249, 251, 258, 278, 305, 329, 332, 384, 409.

68. Chapter 068 — Derryvree's Sealed Muskeg (31233 BCE). Sources: References 7, 19, 38–39, 87, 109, 136, 148, 156, 165, 173, 205, 222, 227, 258, 290, 375, 384, 392, 417, 432–433.

69. Chapter 069 — Derryvree's Periglacial Lake (31232 BCE). Sources: References 3, 20, 38–39, 41, 78, 110, 119, 132, 148, 163, 173, 183, 235, 258, 282, 334, 360, 384, 392.

70. Chapter 070 — The Awbeg Bone Mark (31231 BCE). Sources: References 9, 23, 39, 41, 72, 97, 148, 163, 165, 173, 212, 248, 258, 278, 311, 390, 394, 408, 418, 435.

71. Chapter 071 — Maguirebridge's Mountain-Avens (31230 BCE). Sources: References 3, 20, 26, 41, 94, 119, 148, 152, 163, 173, 198, 207, 258, 261, 275, 282, 303, 306, 309, 384, 390, 405.

72. Chapter 072 — Castlepook's Hyena Den (31229 BCE). Sources: References 3, 42, 59, 69, 92, 132, 152, 163, 173, 212, 258, 261, 265, 278, 287, 335, 384, 392, 409, 423.

73. Chapter 073 — Derryvree's Arctic Clubmoss (31228 BCE). Sources: References 19, 41, 73, 147–148, 152, 158, 163, 198, 205, 213, 220, 258, 272, 278, 336, 341, 344, 351, 382, 384, 390, 405, 418.

74. Chapter 074 — Mammoth Cave Before the Maximum (31227 BCE). Sources: References 3, 39, 42, 106, 143, 158, 165, 199, 213, 215, 220, 241, 258, 292, 306, 311, 339, 365, 393, 397, 404–405.

75. Chapter 075 — Doneraile's Reindeer Femur (31226 BCE). Sources: References 41, 89, 97, 119, 130, 144, 152, 163, 173, 193–194, 240, 258, 278, 334, 384, 388, 392, 402, 405.

76. Chapter 076 — Derryvree's Tundra Garden (31225 BCE). Sources: References 10, 20, 64, 68, 100, 117, 173, 205, 240, 245, 258, 260, 271, 278, 291, 352, 382, 384, 389, 392, 405, 435.

77. Chapter 077 — Castlepook's Rangifer Femur (31224 BCE). Sources: References 19, 38, 129, 152, 169, 173, 181, 194, 205, 258, 269, 278, 335, 351, 381, 384, 391, 408, 418, 439.

78. Chapter 078 — Derryvree's Frostbound Reedbeds (31223 BCE). Sources: References 3, 20, 41, 69, 97, 148, 157, 163, 165, 173, 200, 205, 251, 258, 261, 278, 332, 384, 392, 405, 435.

79. Chapter 079 — Derryvree's Intertill Moss Bed (31222 BCE). Sources: References 3, 20, 39, 41, 112, 163, 173, 206, 211, 235, 258, 262, 270, 278, 282, 318, 329, 350, 373, 392.

80. Chapter 080 — BIRM-166's Fermanagh Waterline (31221 BCE). Sources: References 5, 68, 100, 114, 138, 144, 152, 173, 193, 206, 215, 245, 258, 278, 284, 331, 339, 384, 392, 418.

81. Chapter 081 — The Castlepook Reindeer Bone (31220 BCE). Sources: References 3, 39–40, 69, 84–85, 99, 148, 163, 204, 243, 258, 264, 282, 286, 357, 390, 411, 416, 427.

82. Chapter 082 — Mammoth Cave's Lone Incision (31219 BCE). Sources: References 3, 38, 42, 69–70, 163, 173, 232, 241, 258, 261, 290, 292, 307, 335, 341, 366, 370, 383, 390.

83. Chapter 083 — The Castlepook Chop Mark (31218 BCE). Sources: References 38, 41, 148, 150, 152, 162–163, 173, 185, 205, 239, 252, 258, 272, 278, 305, 326, 335, 339, 384–385, 391, 405, 418.

84. Chapter 084 — Elephant Hall’s Long Winter (31217 BCE). Sources: References 19, 69, 115, 122, 124, 148, 162–163, 173, 185, 187, 210, 220, 236, 258, 278, 383, 391, 421, 436.

85. Chapter 085 — Derryvree’s Hidden Sedge Marsh (31216 BCE). Sources: References 15–16, 40, 68–69, 107, 132, 148, 162, 173, 194, 198, 205, 245, 258, 265, 290, 307, 390, 405, 408, 421.

86. Chapter 086 — Castlepook’s Reindeer Traverse (31215 BCE). Sources: References 20, 38, 41, 69, 149, 163, 173, 215, 224, 240, 255, 258, 262, 278, 290, 295, 370, 392, 424, 435.

87. Chapter 087 — Castlepook’s Scavenger Cave (31214 BCE). Sources: References 3, 14, 39, 41, 69, 93, 97, 115–116, 148, 156, 173, 213, 220, 258, 261, 278, 288, 302, 305, 370, 392.

88. Chapter 088 — Castlepook’s Redated Fauna (31213 BCE). Sources: References 25, 40, 97, 126, 131, 162, 173, 191, 194, 225, 236, 258, 261, 324, 335, 354, 361, 370, 388, 390, 405, 416.

89. Chapter 089 — Derryvree’s Trapped Freshwater (31212 BCE). Sources: References 19, 36, 38, 42, 70, 100, 116, 170, 215, 226, 258, 274, 278, 287, 291, 293, 313, 357, 384, 391, 405, 433.

90. Chapter 090 — Derryvree’s Mossy Silt (31211 BCE). Sources: References 3, 40, 148–149, 162, 173, 245, 258, 278, 293, 313, 339, 365, 385, 391, 394, 405, 408, 427, 433.

91. Chapter 091 — BIRM-166’s Tundra Mosaic (31210 BCE). Sources: References 20, 36, 38–39, 95, 100, 152, 156, 173, 175, 215, 255, 258, 272, 278, 346, 358, 384, 392, 396, 405, 427.

92. Chapter 092 — Maguirebridge’s Periglacial Pools (31209 BCE). Sources: References 3, 19, 69, 165, 173, 212, 218, 221, 245, 258, 260–261, 278, 332, 335, 358, 384, 390, 405, 433.

93. Chapter 093 — Fermanagh’s Thirty-Millennia Silt (31208 BCE). Sources: References 20–21, 37, 50, 80, 91, 97, 108, 119, 132, 147–148, 163, 173, 205, 258, 299, 369, 375, 384, 391–392, 418, 425.

94. Chapter 094 — Cork’s Spotted Hyenas (31207 BCE). Sources: References 38, 41, 54, 76, 97, 139, 149, 159, 212, 236, 251, 258, 307, 335, 339, 344, 384, 393, 402, 421.

95. Chapter 095 — Castlepook’s Deep-Time Reindeer (31206 BCE). Sources: References 3, 19, 33, 41, 67, 72, 97, 154, 173, 232, 249, 258, 290, 332, 349, 370, 384, 390, 420, 435.

96. Chapter 096 — Castlepook’s Solitary Reindeer (31205 BCE). Sources: References 38, 53, 73, 82, 96–97, 123, 148, 155, 160, 173, 179, 202, 236, 260, 269, 277, 288, 312, 324, 391, 405.

97. Chapter 097 — Bogbean Under the Drumlin (31204 BCE). Sources: References 19, 53, 71, 74, 97, 132, 148, 163, 173, 187, 190, 207, 258, 261, 269, 328, 370, 384, 390, 435.

98. Chapter 098 — The Doneraile Butchery Question (31203 BCE). Sources: References 3, 19, 41, 59, 69–70, 111, 148, 163, 172, 195, 205, 232, 238, 258, 335, 342, 384, 392, 418, 435.

99. Chapter 099 — Ireland’s Iceward Interval (31202 BCE). Sources: References 32, 41, 105, 133, 144, 152, 163, 172, 177, 195, 240, 257, 310, 314, 335, 340, 345, 355, 393, 395, 405, 444.

100. Chapter 100 — Castlepook’s Open-Country Fauna (31201 BCE). Sources: References 3, 38, 40, 48, 69–70, 92, 97, 149, 163, 173, 187, 197, 210, 229, 233, 327, 335, 385, 391, 416, 433.

References

1. **10Be Chronology of the Last Deglaciation of County Donegal, Northwestern Ireland**
https://doi.org/10.1111/j.1502-3885.2008.00040.x

2. **2019:148—Alice & Gwendoline Cave, Clare**
https://excavations.ie/report/2019/Clare/0027706/

3. **2022:564 - Castlepook Cave, Castlepook South, Cork**
https://excavations.ie/report/2022/Cork/0032564/

4. **A 10Be-dated record of glacial retreat in Connemara, Ireland, following the Last Glacial Maximum and implications for regional climate**
https://doi.org/10.1016/j.palaeo.2022.110901

5. **A 57,000-Year Oxygen Isotope Record from the Greenland Ice Core Project (GRIP)**
https://doi.org/10.1126/science.264.5163.1173

6. **A 60,000 year Greenland stratigraphic ice core chronology**
https://doi.org/10.5194/cp-4-47-2008

7. **A Chronology for the Last Glacial Period: Synchronizing Greenland and Antarctic Ice Cores**
https://doi.org/10.1002/2014RG000448

8. **A Critical Review and Re-investigation of the Pleistocene Deposits Between Cranfield Point and Kilkeel, Northern Ireland**
https://nora.nerc.ac.uk/id/eprint/521184/

9. **Activity: Rockin Reindeer Fossils**
https://cms.museum.ie/en-IE/Museums/Natural-History/Engage-And-Learn/Museum-at-Home/Rockin-Reindeer-Fossils

10. **Advance and Retreat of the Marine-Terminating Irish Sea Ice Stream into the Celtic Sea During the Last Glacial: Timing and Maximum Extent**
https://doi.org/10.1016/j.margeo.2019.03.003

11. **Advance and retreat of the marine-terminating Irish Sea Ice Stream into the Celtic Sea during the Last Glacial: Timing and maximum extent**
https://livrepository.liverpool.ac.uk/3035296/

12. **Advance and Retreat of the Marine-Terminating Irish Sea Ice Stream into the Celtic Sea During the Last Glacial: Timing and Maximum Extent**
https://eprints.gla.ac.uk/183367/1/183367.pdf

13. **Advances in Irish Quaternary Studies**
https://doi.org/10.2991/978-94-6239-219-9

14. **Advances in Irish Quaternary Studies**
https://link.springer.com/book/10.2991/978-94-6239-219-9

15. **Aghnadarragh**
https://www.habitas.org.uk/escr/site.asp?item=1

16. **Aghnadarragh ASSI**
https://www.daera-ni.gov.uk/protected-areas/aghnadarragh-assi

17. **A Marine Isotope Stage 4 age for Pleistocene raised beach deposits near Fethard, southern Ireland**
https://doi.org/10.1002/jqs.2808

18. **A Middle Midlandian Freshwater Series at Derryvree, Maguirebridge, County Fermanagh, Northern Ireland**
https://doi.org/10.1080/00750776309555569

19. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://www.researchgate.net/publication/252327954_A_Middle_Midlandian_Freshwater_Series_at_Derryvree_Maguiresbridge_County_Fermanagh_Northern_Ireland

20. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://doi.org/10.1098/rspb.1972.0018

21. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://sheffield.ac.uk/media/19279/download?attachment=

22. A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland
https://royalsocietypublishing.org/doi/10.1098/rspb.1972.0067

23. A Middle Midlandian freshwater series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland
https://www.tara.tcd.ie/bitstreams/969fd7c8-36ef-4262-a961-336fe7285015/download

24. AMS radiocarbon dating of ancient bone using ultrafiltration
https://doi.org/10.2458/azu_js_rc.48.3569

25. AMS Radiocarbon Dating of Ancient Bone Using Ultrafiltration
https://doi.org/10.1017/S0033822200039473

26. An All-Ireland Quaternary map
https://gsi.ie/publications/publication/an-all-ireland-quaternary-map/

27. Ancient Hybridization and an Irish Origin for the Modern Polar Bear Matriline
https://doi.org/10.1016/j.cub.2011.05.058

28. An Inter-Till Freshwater Deposit at Hollymount, Maguiresbridge, Co. Fermanagh
https://www.bugscep.com/downloads/qbib.pdf

29. A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula
https://www.intarch.ac.uk/journal/issue61/1/12.html

30. A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula
https://intarch.ac.uk/journal/issue61/1/6.html

31. Antarctic evidence for an abrupt northward shift of the Southern Hemisphere westerlies at 32 ka BP
https://www.nature.com/articles/s41467-023-40951-1

32. Anthropogenic changes to the Holocene nitrogen cycle in Ireland
https://pmc.ncbi.nlm.nih.gov/articles/PMC6007156/

33. A Palaeo-Glaciological Reconstruction of the British-Irish Ice Sheet
https://etheses.whiterose.ac.uk/id/eprint/14933/1/489647_vol1.pdf

34. A Pliocene-Pleistocene Stack of 57 Globally Distributed Benthic δ18O Records
https://doi.org/10.1029/2004PA001071

35. Archaeological Excavations at Killuragh Cave, Co. Limerick
https://www.pure.ed.ac.uk/ws/portalfiles/portal/147461825/2018JIA_KilluraghCave.pdf

36. Archaeological Excavations at Killuragh Cave, Co. Limerick: A Persistent Place in the Landscape from the Early Mesolithic to the Late Bronze Age
https://researchrepository.ucd.ie/rest/bitstreams/47195/retrieve

37. Archaeological Excavations at Killuragh Cave, Co. Limerick: A Persistent Place in the Landscape from the Early Mesolithic to the Late Bronze Age
https://researchrepository.ucd.ie/server/api/core/bitstreams/0fa70d1c-1476-4f2f-b49a-7a47c83c23bc/content

38. Archaeological Heritage of County Cork
https://www.corkcoco.ie/sites/default/files/2023-06/archaeological-heritage-of-county-cork-2020.pdf

39. Archaeology Research Excavation Grant 2022
https://www.ria.ie/assets/uploads/2024/05/areg_2022_jennings_final_report_web_ready.pdf

40. A reconsideration of the radiocarbon dating of the Marine Isotope Stage 3 fauna from southern Ireland
https://onlinelibrary.wiley.com/doi/abs/10.1111/bor.12451

41. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland
https://doi.org/10.1111/bor.12451

42. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland
https://onlinelibrary.wiley.com/doi/10.1111/bor.12451

43. A Revised Correlation of Quaternary Deposits in the British Isles
https://www.geolsoc.org.uk/bookshop/products/a-revised-correlation-of-quaternary-deposits-in-the-british-isles/

44. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://doi.org/10.1016/j.quascirev.2014.09.007

45. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://pure.aber.ac.uk/ws/portalfiles/portal/5708372/A_stratigraphic_framework_for_abrupt_climatic_changes_during_the_Last_Glacial_period_based_on_three_synchronized_Greenland_ice_core_records_refining_and_extending_the_INTIMATE_event_stratigraphy.pdf

46. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://www.sciencedirect.com/science/article/pii/S0277379114003485

47. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://cp.copernicus.org/articles/10/2021/2014/

48. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://phrepo.phbern.ch/7196/

49. A Stratigraphic Investigation of the Celtic Sea Megaridges Based on Seismic and Core Data from the Irish-UK Sectors
https://doi.org/10.1016/j.quascirev.2018.08.029

50. A Stratigraphy Framework for Rapid Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records
https://phrepo.phbern.ch/7196/1/1-s2.0-S0277379114003485-main.pdf

51. Autumn 2023 Newsletter
https://www.qub.ac.uk/sites/uas/UASfilestore/Newsletters/UAS%20Newsletter%20Autumn%2023.pdf

52. Bayesian Modelling the Retreat of the Irish Sea Ice Stream
https://doi.org/10.1002/jqs.2616

53. Britain and Ireland: glacial landforms from the Last Glacial Maximum
https://doi.org/10.1016/B978-0-12-823498-3.00033-9

54. Britain and Ireland: Glacial Landforms Prior to the Last Glacial Maximum
https://www.sciencedirect.com/science/chapter/edited-volume/abs/pii/B9780128234983000509

55. BRITICE-CHRONO
https://britice-chrono.sites.sheffield.ac.uk/

56. BRITICE-CHRONO (BRT) Multibeam, Geophysical and Sampling Survey 2014/6_JC106: BRITICE CHRONO (part 1): Irish Sea
https://www.data.gov.uk/dataset/910e9875-0b47-469b-975d-fb18c9325a8c/britice-chrono-brt-multibeam-geophysical-and-sampling-survey-2014-6-jc106-britice-chrono-p-2014

57. BRITICE-CHRONO: Aims, hypotheses and outcomes
https://britice-chrono.sites.sheffield.ac.uk/project/aims

58. BRITICE-CHRONO: Introduction
https://britice-chrono.sites.sheffield.ac.uk/project/introduction

59. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet, 31 to 15 ka
https://doi.pangaea.de/10.1594/PANGAEA.945729

60. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet 31 to 15 ka
https://doi.org/10.1594/PANGAEA.945729

61. BRITICE: The Glacial Mapping Project
https://sheffield.ac.uk/geography-planning/research/geography/projects/britice

62. BRITICE Glacial Map, Version 2: A Map and GIS Database of Glacial Landforms of the Last British-Irish Ice Sheet
https://durham-repository.worktribe.com/output/1348646/britice-glacial-map-version-2-a-map-and-gis-database-of-glacial-landforms-of-the-last-british-irish-ice-sheet

63. BRITICE Glacial Map, Version 2: a Map and GIS Database of Glacial Landforms of the Last British–Irish Ice Sheet
https://onlinelibrary.wiley.com/doi/full/10.1111/bor.12273

64. BRITICE Glacial Map, Version 2: A Map and GIS Database of Glacial Landforms of the Last British–Irish Ice Sheet
https://doi.org/10.1111/bor.12273

65. British–Irish Ice Sheet and Polar Front History of the Goban Spur, Offshore Southwest Ireland Over the Last 250,000 Years
https://onlinelibrary.wiley.com/doi/10.1111/bor.12631

66. British–Irish Ice Sheet and Polar Front History of the Goban Spur, Offshore Southwest Ireland Over the Last 250,000 Years
https://doi.org/10.1111/bor.12631

67. BSBI: Salix herbacea
https://fermanagh.bsbi.org/salix-herbacea-l

68. BSBI: Selaginella selaginoides
https://fermanagh.bsbi.org/selaginella-selaginoides-p-beauv

69. Castlepook Cave, County Cork: County Geological Site Report
https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/CK032_Cork_CGS_Castlepook_Cave.pdf

70. Castlepook Caves
https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf

71. Castlepook Caves Project: Archaeology Research Excavation Grant Report
https://www.ria.ie/assets/uploads/2024/10/AREG-2023-Richard-Jennings.pdf

72. Cenozoic: Tertiary and Quaternary
https://files.core.ac.uk/download/pdf/297011667.pdf

73. Character of advance and retreat of the southwest sector of the British-Irish Ice Sheet during the last glaciation
https://www.sciencedirect.com/science/article/pii/S0277379122002864

74. Character of advance and retreat of the southwest sector of the British-Irish Ice Sheet during the last glaciation
https://doi.org/10.1016/j.quascirev.2022.107655

75. Character of Advance and Retreat of the Southwest Sector of the British-Irish Ice Sheet During the Last Glaciation
https://doi.org/10.1016/j.quascirev.2022.107239

76. Composition and Consequences of the IntCal20 Radiocarbon Calibration Curve
https://pure.qub.ac.uk/en/publications/composition-and-consequences-of-the-intcal20-radiocarbon-calibrat/

77. Composition and Consequences of the IntCal20 Radiocarbon Calibration Curve
https://doi.org/10.1017/qua.2020.1

78. Conserving Quaternary geoheritage in Northern Ireland
https://doi.org/10.1016/j.pgeola.2022.07.005

79. Cosmogenic 10Be Chronology of the Last Deglaciation of Western Ireland, and Implications for Sensitivity of the Irish Ice Sheet to Climate Change
https://mural.maynoothuniversity.ie/id/eprint/1982/1/clark_et_al_gsa_2009.pdf

80. Cosmogenic 10Be Chronology of the Last Deglaciation of Western Ireland, and Implications for Sensitivity of the Irish Ice Sheet to Climate Change
https://eprints.gla.ac.uk/5008/

81. Could Brown Bears (Ursus arctos) Have Survived in Ireland During the Last Glacial Maximum?
https://pmc.ncbi.nlm.nih.gov/articles/PMC3730640/

82. Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol
https://doi.org/10.5194/cp-19-915-2023

83. Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol
https://cp.copernicus.org/articles/19/915/2023/

84. Data - icesamples - software
https://nbi.ku.dk/english/research/pice/centre-for-ice-and-climate/data/

85. Data – ice samples – software
https://www.iceandclimate.nbi.ku.dk/data/

86. Dating Constraints on the Last British-Irish Ice Sheet: A Map and Database
https://doi.org/10.4113/jom.2011.1145

87. Dating Constraints on the Last British-Irish Ice Sheet: A Map and Database
https://www.tandfonline.com/doi/pdf/10.4113/jom.2011.1145

88. Deglacial Rates and Controls for British-Irish Ice Sheet Western Margin During the Last Glaciation
https://pureadmin.uhi.ac.uk/ws/portalfiles/portal/15996924/jqs.3315.pdf

89. Deglaciation, Earth Crustal Behaviour and Sea-Level Changes in the Determination of Insularity: A Perspective from Ireland
https://research.ucc.ie/en/publications/deglaciation-earth-crustal-behaviour-and-sea-level-changes-in-the-2/

90. Deglaciation, Earth Crustal Behaviour and Sea-Level Changes in the Determination of Insularity: A Perspective from Ireland
https://doi.org/10.1144/GSL.SP.1995.096.01.14

91. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland
https://doi.org/10.1002/jqs.3077

92. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3077

93. Deglaciation chronology of the Donegal Ice Centre, northwest Ireland
https://pure.ulster.ac.uk/files/12709773/jqs.pdf

94. Deposits of the Last Glaciation
https://www2.habitas.org.uk/escr/summary.php?item=101

95. Devising Quality Assurance Procedures for Assessment of Legacy Geochronological Data Relating to Deglaciation of the Last British-Irish Ice Sheet
https://eprints.gla.ac.uk/132233/

96. Did the Eurasian ice sheets melt completely in early Marine Isotope Stage 3? New evidence from Norway and a synthesis for Eurasia
https://www.sciencedirect.com/science/article/pii/S0277379123001841

97. Dimensions and chronology of the last ice sheet in Western Ireland
https://www.sciencedirect.com/science/article/abs/pii/S0277379107003022

98. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.10.007

99. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://research-portal.st-andrews.ac.uk/en/publications/dimensions-and-chronology-of-the-last-ice-sheet-in-western-irelan/

100. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.10.019

101. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.11.030

102. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://www.researchgate.net/publication/221947864_Dimensions_and_chronology_of_the_last_ice_sheet_in_Western_Ireland

103. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.06.023

104. Dimensions and Chronology of the Last Ice Sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.12.010

105. Dimensions and chronology of the last ice sheet in Western Ireland
https://doi.org/10.1016/j.quascirev.2007.09.008

106. Distribution and range expansion of deer in Ireland
https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2907.2010.00170.x

107. Dryas octopetala
https://fermanagh.bsbi.org/dryas-octopetala-l

108. Dublin Radiocarbon Dates II
https://journals.uair.arizona.edu/index.php/radiocarbon/article/viewFile/381/386

109. Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British-Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2008.12.026

110. Dynamic cycles, ice streams and their impact on the extent, chronology and deglaciation of the British-Irish Ice Sheet
https://nora.nerc.ac.uk/id/eprint/7166/

111. Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf Northwest of Ireland Driven by Glacioisostatic Depression and High Relative Sea Level
https://livrepository.liverpool.ac.uk/3033771/

112. Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf Northwest of Ireland Driven by Glacioisostatic Depression and High Relative Sea Level
https://doi.org/10.1016/j.quascirev.2018.12.022

113. Early deglaciation of the British-Irish Ice Sheet on the Atlantic shelf northwest of Ireland driven by glacioisostatic depression and high relative sea level
https://eprints.whiterose.ac.uk/140069/8/1-s2.0-S0277379117306157-main.pdf

114. Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf Northwest of Ireland Driven by Glacioisostatic Depression and High Relative Sea Level
https://doi.org/10.1016/j.quascirev.2018.12.030

115. Early deglaciation of the western sector of the Irish Ice Sheet
https://livrepository.liverpool.ac.uk/3033771/1/OCofaighetal2019Early%20deglaciation%20of%20western%20Ireland.pdf

116. Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland
https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian%2C_Pleistocene%2C_Northern_Ireland

117. Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland
https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian,_Pleistocene,_Northern_Ireland

118. Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland
https://doi.org/10.1016/j.quascirev.2016.10.010

119. Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland
https://doi.org/10.1016/j.quascirev.2016.09.019

120. Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland
https://edoc.unibas.ch/entities/publication/f1d27768-63f4-4316-9171-9e17fda96451

121. Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland
https://www.sciencedirect.com/science/article/abs/pii/S0277379116303699

122. Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Last Glacial Climate Variability in SW Ireland
https://files01.core.ac.uk/download/pdf/74206935.pdf

123. Equilibrium simulations of Marine Isotope Stage 3 climate
https://cp.copernicus.org/articles/15/1133/2019/cp-15-1133-2019.html

124. Europe and the County of Cork: A Heritage Perspective
https://www.corkcoco.ie/sites/default/files/2022-10/europe_and_the_county_of_cork_-_a_heritage_perspective_2018.pdf

125. European Middle and Upper Palaeolithic Radiocarbon Dates Are Often Older Than They Look: Problems with Previous Dates and Some Remedies
https://www.cambridge.org/core/journals/antiquity/article/abs/european-middle-and-upper-palaeolithic-radiocarbon-dates-are-often-older-than-they-look-problems-with-previous-dates-and-some-remedies/9AE28C1FDFE6D6F7955EDA140B10965B

126. European Middle and Upper Palaeolithic Radiocarbon Dates Are Often Older Than They Look: the Problems with Previous Dates and Some Remedies
https://ora.ox.ac.uk/objects/uuid%3A62efb14b-b348-4594-afed-38e68706e330

127. European vegetation during Marine Oxygen Isotope Stage-3
https://doi.org/10.1016/S0033-5894(02)00016-9

128. Exploring controls of the early and stepped deglaciation of the last British–Irish Ice Sheet
https://researchportal.plymouth.ac.uk/files/39237921/JQS-20-0108.R1_Benetti_Mar21.pdf

129. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British-Irish Ice Sheet
https://pure.bangor.ac.uk/ws/portalfiles/portal/37340552/JQS_20_0108.R1_Accepted.pdf

130. Exploring controls of the early and stepped deglaciation on the western margin of the British-Irish Ice Sheet
https://cir.cenieh.es/bitstream/20.500.12136/2543/1/Exploring%20controls%20of%20the%20early%20and%20stepped%20deglaciation%20on%20the%20western%20margin%20of%20the%20British%20Irish%20Ice%20Sheet_Benetti_et_al_2021.pdf

131. Exploring controls of the early and stepped deglaciation on the western margin of the British Irish Ice Sheet
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3315

132. Exploring controls of the early and stepped deglaciation on the western margin of the British Irish Ice Sheet
https://research-repository.st-andrews.ac.uk/bitstream/10023/23305/1/Benetti_2021_JQS_Exploring_CC.pdf

133. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet
https://doi.org/10.1002/jqs.3315

134. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet
https://pure.ulster.ac.uk/files/91186146/jqs.3315.pdf

135. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet
https://eprints.gla.ac.uk/247061/1/247061.pdf

136. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3315

137. Exposure-Age Constraints on the Extent, Timing and Rate of Retreat of the Last Irish Sea Ice Stream
https://openresearch-repository.anu.edu.au/items/c21e3752-b174-4685-92d8-615e0b0156a2

138. Exposure-Age Constraints on the Extent, Timing and Rate of Retreat of the Last Irish Sea Ice Stream
https://doi.org/10.1016/j.quascirev.2010.04.002

139. Exposure-Age Constraints on the Extent, Timing and Rate of Retreat of the Last Irish Sea Ice Stream
https://www.sciencedirect.com/science/article/abs/pii/S0277379110000983

140. Extent and deglacial chronology of the last British–Irish Ice Sheet: implications of exposure dating using cosmogenic isotopes
https://doi.org/10.1002/jqs.1310

141. Extent and Deglacial Chronology of the Last British–Irish Ice Sheet: Implications of Exposure Dating Using Cosmogenic Isotopes
https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1310

142. Extent and Retreat History of the Barra Fan Ice Stream Offshore Western Scotland and Northern Ireland During the Last Glaciation
https://doi.org/10.1016/j.quascirev.2018.07.002

143. Extent and Timing of the Last Glacial Maximum (LGM) in Britain and Ireland: A Review
https://onlinelibrary.wiley.com/doi/10.1002/jqs.1404

144. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: A Review
https://doi.org/10.1002/jqs.1404

145. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: A Review
https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1404

146. Fast and Slow Components of Interstadial Warming in the North Atlantic During the Last Glacial
https://doi.org/10.1038/s43247-020-0006-x

147. Field Guides
https://iqua.ie/publications/field-guides/

148. Figure 6—The Subdivision of the Quaternary Period in Ireland
https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-17-unlocked.pdf

149. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland
https://mariondowd.com/wp-content/uploads/2025/04/2016-qsr-palaeolithic-ireland.pdf

150. First evidence of a Late Upper Palaeolithic human presence in Ireland
https://pure.atu.ie/en/publications/first-evidence-of-a-late-upper-palaeolithic-human-presence-in-ire-3/

151. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland
https://doi.org/10.1016/j.quascirev.2016.06.012

152. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland
https://doi.org/10.1016/j.quascirev.2016.02.029

153. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland
https://www.sciencedirect.com/science/article/pii/S0277379116300610

154. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland
https://doi.org/10.1016/j.quascirev.2016.02.002

155. First evidence of a Late Upper Palaeolithic human presence in Ireland
https://doi.org/10.1016/j.quascirev.2016.02.031

156. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets, at Aghnadarragh, County Antrim, Northern Ireland
https://doi.org/10.1002/jqs.3390020104

157. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets, at Aghnadarragh, County Antrim, Northern Ireland
https://eurekamag.com/research/018/968/018968909.php

158. Geology of Ireland
https://gsi.ie/geoscience-topics/geology/geology-of-ireland/

159. Geomorphic Evidence for Active and Inactive Phases of Late Devensian Ice in North-Central Ireland
https://www.sciencedirect.com/science/article/abs/pii/S0169555X0500231X

160. Global distribution of centennial-scale records for Marine Isotope Stage (MIS) 3: a database
https://www.sciencedirect.com/science/article/pii/S0277379101001391

161. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: the BRITICE-CHRONO Reconstruction
https://pure.ulster.ac.uk/ws/portalfiles/portal/104683424/bor.12594.pdf

162. Growth and retreat of the last British–Irish Ice Sheet, 31 000 to 15 000 years ago: the BRITICE-CHRONO reconstruction
https://eprints.ncl.ac.uk/286460

163. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction
https://doi.org/10.1111/bor.12594

164. Growth and retreat of the last British–Irish Ice Sheet, 31,000 to 15,000 years ago: the BRITICE-CHRONO reconstruction
https://pure.ulster.ac.uk/files/104683424/bor.12594.pdf

165. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction
https://www.bas.ac.uk/data/our-data/publication/growth-and-retreat-of-the-last-british-irish-ice-sheet-31-000-to-15-000-years-ago-the-britice%E2%80%90chrono-reconstruction/

166. Growth and retreat of the last British–Irish Ice Sheet, 31,000 to 15,000 years ago: the BRITICE-CHRONO reconstruction
https://shura.shu.ac.uk/30706/1/clark2022boreas.pdf

167. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: the BRITICE-CHRONO Reconstruction
https://onlinelibrary.wiley.com/doi/full/10.1111/bor.12594

168. Growth and retreat of the last British–Irish Ice Sheet, 31,000 to 15,000 years ago: the BRITICE-CHRONO reconstruction
https://eprints.gla.ac.uk/278917/2/278917.pdf

169. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: the BRITICE-CHRONO Reconstruction
https://dspace.stir.ac.uk/handle/1893/34770

170. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: the BRITICE-CHRONO Reconstruction
https://eprints.whiterose.ac.uk/id/eprint/194087/

171. Guide to the National Museum of Ireland
https://www.museum.ie/getmedia/a3ebbb22-2057-4200-aae8-cd958854d89f/ks_guide_web_en-%281%29.pdf

172. Guide to the National Museum of Ireland – Natural History
https://www.museum.ie/getmedia/e46732aa-23b9-459c-9522-0a8604f4df98/nhm_guide_web_en_1.pdf

173. Heritage Artefacts of County Cork
https://www.corkcoco.ie/sites/default/files/2023-06/heritage-artefacts-of-county-cork-2021.pdf

174. High-Resolution Record of Northern Hemisphere Climate Extending into the Last Interglacial Period
https://doi.org/10.1038/nature02805

175. Historic Environment Viewer
https://www.archaeology.ie/advice-and-support/locate-a-monument-or-wreck/historic-environment-viewer/

176. How Open Were European Primeval Forests? Hypothesis Testing Using Palaeoecological Data
https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2745.2004.00964.x

177. Ice Age Ireland
https://www.museum.ie/getmedia/acab45bf-2252-4f25-9cf0-c0268f0c7f0d/Ice_Age_Activity_Overview.pdf

178. Ice Sheet Extension to the Celtic Sea Shelf Edge at the Last Glacial Maximum
https://mural.maynoothuniversity.ie/8868/1/SMcC_ice%20sheet%202015.pdf

179. Ice sheet extension to the Celtic Sea shelf edge at the Last Glacial Maximum
https://www.sciencedirect.com/science/article/abs/pii/S0277379114004934

180. Ice Sheet Limits and Chronostratigraphy in the Southern Sector of the Last Irish Ice Sheet
https://infomar.ie/rd-and-education/publications/ice-sheet-limits-and-chronostratigraphy-southern-sector-last-irish

181. IntCal
https://intcal.org/index.html

182. IntCal20: Radiocarbon Calibrations
https://www.cambridge.org/core/journals/radiocarbon/calibrations/intcal-20

183. IntCal: International Radiocarbon Calibration
https://www.intcal.org/

184. IntCal Data
https://www.intcal.org/data.html

185. IntCal History
https://intcal.org/history.html

186. IntCal History
https://www.intcal.org/history.html

187. IntCal Publications
https://www.intcal.org/publications.html

188. INTIMATE Publications
https://intimate.amu.edu.pl/publications/

189. Introduction to the Glacial Sand and Gravel Landscapes of Northern Ireland
https://www.habitas.org.uk/escr/site.asp?Item=439

190. Introduction to the Late Quaternary and Holocene of Northern Ireland
https://www.habitas.org.uk/escr/site.asp?Item=101

191. Investigating Seasonal Mobility in Irish Giant Deer (Megaloceros giganteus) Through Strontium Isotope Analysis
https://research-portal.uu.nl/files/139756950/J_Quaternary_Science_2022_Douw_Investigating_seasonal_mobility_in_Irish_giant_deer_Megaloceros_giganteus_Blumenbach_.pdf

192. Investigating Seasonal Mobility in Irish Giant Deer Megaloceros giganteus Through Strontium Isotope Analysis
https://doi.org/10.1002/jqs.3447

193. Ireland's Palaeolithic Archaeology – Fleeting Footprints in a Frozen Land
https://irisharchaeology.org/before-the-ice-melted-irelands-palaeolithic-fleeting-footprints-in-a-frozen-land/

194. Ireland: Submerged Prehistoric Sites and Landscapes
https://link.springer.com/chapter/10.1007/978-3-030-37367-2_11

195. Ireland: Submerged Prehistoric Sites and Landscapes
https://doi.org/10.1007/978-3-030-37367-2_11

196. Ireland: Submerged Prehistoric Sites and Landscapes
https://pure.ulster.ac.uk/ws/portalfiles/portal/78797612/IrelandSubmergedPrehistoricSit_chapter.pdf

197. Ireland Before 3000 B.C.
https://academic.oup.com/book/47270/chapter-abstract/422427549

198. Ireland Through Geological Time
https://www.gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/

199. Ireland Through Geological Time
https://www.gsi.ie/en-ie/education/the-geology-of-ireland/Pages/Ireland-through-geological-time.aspx

200. Ireland’s Earliest Settlers: Evidence for an Irish Palaeolithic
https://pure.qub.ac.uk/files/373000291/JSmall_thesis_final_2.pdf

201. Irish Association for Quaternary Studies: About Us
https://iqua.ie/about-us/

202. Irish Association for Quaternary Studies Guide 13
https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-13-unlocked.pdf

203. Irish Cave Exploration
https://doi.org/10.1038/012212b0

204. Irish Cave Exploration
https://www.nature.com/articles/012212b0

205. Irish Pleistocene Biostratigraphy
https://www.researchgate.net/publication/290822499_Irish_Pleistocene_biostratigraphy

206. Irish Pleistocene Biostratigraphy
https://www.jstor.org/stable/30002348

207. Irish Pleistocene Biostratigraphy
https://doi.org/10.3318/irisjeartscie.2019.02

208. Irish Quaternary Association
https://iqua.ie/

209. Irish Quaternary Vertebrates
https://www.researchgate.net/publication/309313860_Irish_Quaternary_Vertebrates

210. Karst of Ireland
https://gsi.geodata.gov.ie/downloads/Groundwater/Other/GSI_Karst_of_Ireland_David_Drew_2018.pdf

211. Landform Modification by Palaeo-Ice Streams in East-Central Ireland
https://doi.org/10.3189/172756499781821616

212. Landscapes and Environments of the Last Glacial-Interglacial Transition: A Time of Amazingly Rapid Change in Ireland
https://www.researchgate.net/publication/299975247_Landscapes_and_environments_of_the_last_glacial-interglacial_transition_a_time_of_amazingly_rapid_change_in_Ireland

213. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet
https://www.sciencedirect.com/science/article/abs/pii/S0277379116301172

214. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2016.08.022

215. Last Glacial Maximum cirque glaciation in Ireland and implications for reconstructions of the Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2016.04.006

216. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2016.03.020

217. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet
https://www.researchwithrowan.com/en/publications/last-glacial-maximum-cirque-glaciation-in-ireland-and-implication/

218. Lateglacial Vegetation and Environment in Ireland: First Results From Four Western Sites
https://www.sciencedirect.com/science/article/pii/0277379193900079

219. Late Midlandian, Pleistocene, Northern Ireland
https://earthwise.bgs.ac.uk/index.php/Late_Midlandian,_Pleistocene,_Northern_Ireland

220. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland
https://www.sciencedirect.com/science/article/abs/pii/S0277379110000132

221. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://intelligent-earth.ox.ac.uk/node/4030041

222. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://doi.org/10.1016/j.quascirev.2010.01.011

223. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://durham-repository.worktribe.com/output/1486214

224. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://doi.org/10.1016/j.quascirev.2010.02.003

225. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://researchportal.plymouth.ac.uk/en/publications/late-pleistocene-chronostratigraphy-and-ice-sheet-limits-southern/

226. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland
https://doi.org/10.1016/j.quascirev.2010.01.004

227. Late Pleistocene Sediments, Landforms and Events in Scotland: a Review of the Terrestrial Stratigraphic Record
https://www.cambridge.org/core/journals/earth-and-environmental-science-transactions-of-royal-society-of-edinburgh/article/late-pleistocene-sediments-landforms-and-events-in-scotland-a-review-of-the-terrestrial-stratigraphic-record/04361148265AA29138A2843CEBA1108B

228. Learn About: The Ice Age
https://cms.museum.ie/en-IE/Museums/Natural-History/Engage-And-Learn/Museum-at-Home/Activity-Sheet-Ice-Age-Ireland-Cool-Fossils

229. Mammals
https://cms.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Mammals

230. Mammoth and Musk Ox ESR-Dated to the Early Midlandian at Aghnadarragh, County Antrim, Northern Ireland, and the Age of the Fermanagh Stadial
https://doi.org/10.1002/gj.2668

231. Mammoth and Musk Ox ESR-Dated to the Early Midlandian at Aghnadarragh, County Antrim, Northern Ireland, and the Age of the Fermanagh Stadial
https://onlinelibrary.wiley.com/doi/10.1002/gj.2668

232. Mammoth Cave
https://irishcaves.ubss.org.uk/gazetteer/cork/mammoth-cave/

233. Marine Geophysical Evidence for Late Pleistocene Ice Sheet Extent and Recession off Northwest Ireland
https://pure.ulster.ac.uk/en/publications/marine-geophysical-evidence-for-late-pleistocene-ice-sheet-extent-3/

234. Maximum Extent and Dynamic Behaviour of the Last British-Irish Ice Sheet West of Ireland
https://pure.ulster.ac.uk/en/publications/maximum-extent-and-dynamic-behaviour-of-the-last-british-irish-ic-3

235. Maximum extent and dynamic behaviour of the last British-Irish Ice Sheet west of Ireland
https://doi.org/10.1016/j.quascirev.2015.09.015

236. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland
https://www.sciencedirect.com/science/article/pii/S027737911530113X

237. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland
https://doi.org/10.1016/j.quascirev.2015.10.010

238. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland
https://doi.org/10.1016/j.quascirev.2015.08.012

239. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland
https://doi.org/10.1016/j.quascirev.2015.11.003

240. Maximum Extent and Readvance Dynamics of the Irish Sea Ice Stream and Irish Sea Glacier Since the Last Glacial Maximum
https://doi.org/10.1002/jqs.3313

241. Maximum extent and readvance dynamics of the Irish Sea Ice Stream and Irish Sea Glacier since the Last Glacial Maximum
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3313

242. Maximum Extent and Readvance Dynamics of the Irish Sea Ice Stream and Irish Sea Glacier Since the Last Glacial Maximum
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3313

243. Maximum extent and readvance dynamics of the Irish Sea Ice Stream and Irish Sea Glacier since the Last Glacial Maximum
https://eprints.whiterose.ac.uk/174565/1/jqs.3313.pdf

244. McCabe, A.M. (1987), Quaternary Deposits and Glacial Stratigraphy in Ireland
https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-29.pdf

245. Menyanthes trifoliata
https://fermanagh.bsbi.org/menyanthes-trifoliata-l

246. Methods: Oxford Radiocarbon Accelerator Unit
https://www.oxcal.org/methods.html

247. Mid-to-Late Marine Isotope Stage 3 Mammal Faunas of Britain: A New Look
https://earlymodernhumaneurope.com/wp-content/uploads/2019/02/Dinnis-et-al-2016-PGA.pdf

248. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland
https://www.jstor.org/stable/30002377

249. Myriophyllum alterniflorum
https://fermanagh.bsbi.org/myriophyllum-alterniflorum-dc

250. New Age Constraints for the Maximum Extent of the Last British–Irish Ice Sheet (NW Sector)
https://doi.org/10.1002/jqs.2603

251. New Data for the Last Glacial Maximum in Great Britain and Ireland
https://www.sciencedirect.com/science/article/pii/S0277379101001020

252. New data for the Last Glacial Maximum in Great Britain and Ireland
https://doi.org/10.1016/S0277-3791(01)00102-0

253. New Data for the Last Glacial Maximum in Great Britain and Ireland
https://doi.org/10.1016/S0277-3791(01)00119-3

254. New Data for the Last Glacial Maximum in Great Britain and Ireland
https://pure.ulster.ac.uk/en/publications/new-data-for-the-last-glacial-maximum-in-great-britain-and-irelan-3/

255. New Data for the Last Glacial Maximum in Great Britain and Ireland
https://doi.org/10.1016/S0277-3791(01)00109-3

256. New Insights on the Fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave
https://www.sciencedirect.com/science/article/pii/S0277379124003287

257. New insights on the fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave
https://doi.org/10.1016/j.quascirev.2024.108812

258. New Insights on the Fauna of Ireland’s Younger Dryas and Early Holocene from Alice & Gwendoline Cave
https://doi.org/10.1016/j.quascirev.2024.108827

259. New Insights on the Fauna of Ireland’s Younger Dryas and Early Holocene from Alice & Gwendoline Cave
https://mariondowd.com/wp-content/uploads/2025/04/2024-qsr-ag.pdf

260. New Insights on the Fauna of Ireland’s Youngest Pleistocene: Late Pleistocene to Early Holocene Bone Assemblages from Alice and Gwendoline Cave, County Clare
https://clarecastleballyea.clareheritage.org/wp-content/uploads/sites/5/2025/03/New_insights_on_the_fauna_of_Irelands_Yo_compressed.pdf

261. Occurrence of Mammalia Relicts at Site Castlepook Cave
https://doi.pangaea.de/10.1594/PANGAEA.63585

262. Occurrence of Mammalia Relicts at Site Castlepook Cave
https://doi.org/10.1594/PANGAEA.63585

263. On the Cave of Castlepook, Near Doneraile, Co. Cork
https://doi.org/10.1017/S0016756800122435

264. On the Cave of Castlepook, Near Doneraile, Co. Cork
https://resolve.cambridge.org/core/services/aop-cambridge-core/content/view/954225B0449C3241B2832BF4AF5456AB/S0016756800122435a.pdf/notices_of_memoirs.pdf

265. On the discovery of hyaena, mammoth and other extinct mammals in a carboniferous cavern in County Cork
https://sources.nli.ie/Record/PS_UR_095315

266. On the postglacial isostatic adjustment of the British Isles and the shallow viscoelastic structure of the Earth
https://academic.oup.com/gji/article/148/3/443/821518

267. Origin of British and Irish Mammals: Disparate Post-Glacial Colonisation and Species Introductions
https://www.sciencedirect.com/science/article/pii/S0277379114002078

268. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland
https://doi.org/10.1016/j.margeo.2019.106056

269. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland
https://www.sciencedirect.com/science/article/pii/S0025322719302245

270. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland
https://doi.org/10.1016/j.margeo.2019.106087

271. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland
https://doi.org/10.1016/j.margeo.2019.104049

272. Outreach and Education Resources
https://iqua.ie/outreach-and-education-resources/

273. OxCal
https://c14new.arch.ox.ac.uk/oxcal.html

274. OxCal
https://c14.arch.ox.ac.uk/oxcal.html

275. OxCal: Radiocarbon Calibration and Analysis
https://oxcal.org/oxcal.html

276. Oxygen isotope stage 3 fluvial and eolian successions in Europe compared with climate model results
https://doi.org/10.1016/S0033-5894(03)00002-4

277. Oxygen isotope stage 3 fluvial and eolian successions in Europe compared with climate model results
https://www.sciencedirect.com/science/article/pii/S0033589403000024

278. Palaeoecology
https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-16-600dpi.pdf

279. Palaeolithic Ireland – New Evidence Emerges from the Emerald Isle
https://www.ucl.ac.uk/human-evolution/news/2016/mar/palaeolithic-ireland-new-evidence-emerges-emerald-isle

280. Palaeolithic Ireland—New Evidence Emerges from the Emerald Isle
https://www.ucl.ac.uk/human-evolution/news/2016/mar/palaeolithic-ireland-new-evidence-emerges

281. Pattern, style and timing of British–Irish Ice Sheet advance and retreat over the last 45,000 years: evidence from NW Scotland and the adjacent continental shelf
https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.3296

282. Pattern and timing of retreat of the last British-Irish Ice Sheet
https://nora.nerc.ac.uk/id/eprint/507486/

283. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet
https://research.manchester.ac.uk/en/publications/pattern-and-timing-of-retreat-of-the-last-british-irish-ice-sheet/

284. Pattern and timing of retreat of the last British–Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2010.07.019

285. Periglacial Trimlines and the Extent of the Kerry-Cork Ice Cap, SW Ireland
https://doi.org/10.1016/j.quascirev.2011.11.008

286. Phylogeographic, Ancient DNA, Fossil and Morphometric Analyses Reveal Ancient and Modern Introductions of a Large Mammal: The Complex Case of Red Deer (Cervus elaphus) in Ireland
https://www.sciencedirect.com/science/article/abs/pii/S0277379112000856

287. Phylogeographic, ancient DNA, fossil and morphometric analyses reveal ancient and modern introductions of a large mammal: the complex case of red deer (Cervus elaphus) in Ireland
https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20%282012%29%2074-84%20Carden%20et%20al.pdf

288. Phylogeographic, ancient DNA, fossil and morphometric analyses reveal ancient and modern introductions of a large mammal: the complex case of red deer (Cervus elaphus) in Ireland
https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20(2012)%2074-84%20Carden%20et%20al.pdf

289. Phylogeographic, Ancient DNA, Fossil and Morphometric Analyses Reveal Ancient and Modern Introductions of a Large Mammal: The Complex Case of Red Deer in Ireland
https://doi.org/10.1016/j.quascirev.2012.02.012

290. Pleistocene Vertebrates in the British Isles
https://www.rhinoresourcecenter.com/pdf_files/133/1336577813.pdf

291. Pleistocene Vertebrates in the British Isles
https://rhinoresourcecenter.com/wp-content/uploads/2012/04/1336577813.pdf

292. Prehistoric Details
https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details

293. Prehistoric Details
https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-(1)/Stone-Age/Prehistoric-Details

294. Prehistoric Details
https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details

295. Prehistoric Details: Mell Flint Flake
https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-(1)/Stone-Age/Prehistoric-Details

296. Prehistoric Ireland
https://cms.museum.ie/ga-IE/Museums/Archaeology/Exhibitions/Prehistoric-Ireland

297. Preliminary assessment of the archive of faunal remains from excavated Irish cave sites
https://www.researchgate.net/publication/256886486_Preliminary_assessment_of_the_archive_of_faunal_remains_from_excavated_Irish_cave_sites

298. Project Findings Provide Essential Insight into the Last British–Irish Ice Sheet
https://www.bgs.ac.uk/news/project-findings-provide-essential-insight-into-the-last-british-irish-ice-sheet/

299. Publications
https://iqua.ie/publications/

300. Quality assurance of ultrafiltered bone dating
https://doi.org/10.2458/azu_js_rc.49.2961

301. Quaternary
https://gsi.ie/en-ie/data-and-maps/Pages/Quaternary.aspx

302. Quaternary
https://www.gsi.ie/data-and-maps/quaternary/

303. Quaternary deposits and glacial stratigraphy in Ireland
https://www.sciencedirect.com/science/article/abs/pii/0277379187900084

304. Quaternary deposits and glacial stratigraphy in Ireland
https://pure.ulster.ac.uk/en/publications/quaternary-deposits-and-glacial-stratigraphy-in-ireland-3/

305. Quaternary Deposits and Glacial Stratigraphy in Ireland
https://doi.org/10.1016/0277-3791(87)90008-4

306. Quaternary Geology and Geomorphology Data
https://www.gsi.ie/ga-ie/data-and-maps/Pages/Quaternary.aspx

307. Quaternary Site Descriptions
https://iqua.ie/wp-content/uploads/2020/10/Quaternary-sites-of-Ireland-map-INQUA-2019.pdf

308. Radiocarbon Calibration
https://c14.arch.ox.ac.uk/calibration

309. Radiocarbon Calibration, Oxford Radiocarbon Accelerator Unit
https://www.oxcal.org/calibration.html

310. Radiocarbon Constraints on the Age of the Maximum Advance of the British-Irish Ice Sheet in the Celtic Sea
https://doi.org/10.1016/j.quascirev.2007.03.008

311. Radiocarbon Constraints on the Age of the Maximum Advance of the British-Irish Ice Sheet in the Celtic Sea
https://durham-repository.worktribe.com/output/1579471/radiocarbon-constraints-on-the-age-of-the-maximum-advance-of-the-british-irish-ice-sheet-in-the-celtic-sea

312. Radiocarbon Constraints on the Age of the Maximum Advance of the British–Irish Ice Sheet in the Celtic Sea
https://www.sciencedirect.com/science/article/abs/pii/S0277379107000844

313. Radiocarbon constraints on the history of the western Irish ice sheet prior to the Last Glacial Maximum
https://pure.ulster.ac.uk/en/publications/radiocarbon-constraints-on-the-history-of-the-western-irish-ice-s-3/

314. Radiocarbon Constraints on the History of the Western Irish Ice Sheet Prior to the Last Glacial Maximum
https://doi.org/10.1130/G23167A.1

315. Radiocarbon Dates from the Oxford AMS System: Archaeometry Datelist 31
https://onlinelibrary.wiley.com/doi/10.1111/j.1475-4754.2002.tb01101.x

316. Radiocarbon Dating and Chronological Modelling
https://historicengland.org.uk/images-books/publications/radiocarbon-dating-chronological-modelling/radiocarbon-dating/

317. Recent Developments in Calibration for Archaeological and Environmental Samples
https://www.cambridge.org/core/journals/radiocarbon/article/recent-developments-in-calibration-for-archaeological-and-environmental-samples/671DCC8A4A38ACF57786EFC659E5D8F6

318. Recent Progress on Combining Geomorphological and Geochronological Data with Ice Sheet Modelling, Demonstrated Using the Last British–Irish Ice Sheet
https://doi.org/10.1002/jqs.3098

319. Reconstructing the last Irish Ice Sheet 2: a geomorphologically-driven model of ice sheet growth, retreat and dynamics
https://www.sciencedirect.com/science/article/abs/pii/S0277379109003163

320. Reconstruction and 36Cl Based Geochronology of the Deglaciation of Central Ireland
https://www.sciencedirect.com/science/article/pii/S0277379126000557

321. Reconstruction and 36Cl based geochronology of the deglaciation of central Ireland
https://doi.org/10.1016/j.quascirev.2026.109846

322. Reindeer Bone Found in Cork Cave Shows Human Activity in Ireland 33,000 Years Ago
https://www.thejournal.ie/reindeer-bone-cork-cave-5413607-Apr2021/

323. Removing contaminants: a restatement of the value of isolating single compounds for AMS dating
https://doi.org/10.15184/aqy.2019.82

324. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation
https://www.sciencedirect.com/science/article/abs/pii/S0277379112000029

325. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation
https://www.researchgate.net/publication/257110370_Response_of_the_Irish_Ice_Sheet_to_abrupt_climate_change_during_the_last_deglaciation

326. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation
https://doi.org/10.1016/j.quascirev.2012.01.001

327. Restricted Cirque Glaciers in the Wicklow Mountains, Ireland, During the Nahanagan Stadial (Greenland Stadial-1/Younger Dryas)
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3699

328. Sedimentary ancient DNA reveals Late Pleistocene faunal connectivity between Ireland and Eurasia
https://www.biorxiv.org/content/10.64898/2026.07.10.737191v1

329. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia
https://doi.org/10.64898/2026.07.10.737191

330. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland
https://eprints.gla.ac.uk/121683/

331. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland
https://doi.org/10.1016/j.quascirev.2016.03.012

332. Soils of County Waterford
https://www.teagasc.ie/media/website/publications/2011/Soils-of-Co-Waterford-WEB.pdf

333. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles
https://doi.org/10.5194/cp-21-261-2025

334. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles
https://cp.copernicus.org/articles/21/261/2025/

335. Spotted Hyena Skull
https://cms.museum.ie/ga-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4

336. Spotted Hyena Skull
https://cms.museum.ie/en-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4

337. Spotted Hyena Skull
https://www.museum.ie/en-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4

338. Stoats (Mustela erminea) Provide Evidence of Natural Overland Colonization of Ireland
https://pmc.ncbi.nlm.nih.gov/articles/PMC2176200/

339. Stratigraphic and Palaeo-Geomorphological Evidence for the Glacial-Deglacial History of the Last British-Irish Ice Sheet in the North-Western Irish Sea
https://research.ucc.ie/en/publications/stratigraphic-and-palaeo-geomorphological-evidence-for-the-glacia/

340. Stratigraphic and Palaeo-Geomorphological Evidence for the Glacial-Deglacial History of the Last British-Irish Ice Sheet in the North-Western Irish Sea
https://doi.org/10.1016/j.quascirev.2022.107909

341. Stratigraphic and Palaeo-Geomorphological Evidence for the Glacial-Deglacial History of the Last British-Irish Ice Sheet in the North-Western Irish Sea
https://www.sciencedirect.com/science/article/pii/S0277379122005406

342. Stratigraphic and palaeo-geomorphological evidence for the glacial-deglacial history of the last British-Irish Ice Sheet in the north-western Irish Sea
https://doi.org/10.1016/j.quascirev.2022.107201

343. Subglacial Bedform Geomorphology of the Irish Ice Sheet Reveals Major Configuration Changes During Growth and Decay
https://onlinelibrary.wiley.com/doi/10.1002/jqs.627

344. The Antiquity of Man in Ireland
https://www.cambridge.org/core/books/abs/irish-stone-age/antiquity-of-man-in-ireland/E2F2C600F242ED3B71040EF9A7B3E38C

345. The Antiquity of Man in Ireland
https://doi.org/10.1017/CBO9781316530368.007

346. The Archaeological Survey
https://www.archaeology.ie/about-us/what-we-do/archaeological-survey/

347. The Archaeology of Caves in Ireland
https://caves.org/journal-of-cave-and-karst-studies/jcks-articles/the-archaeology-of-caves-in-ireland-2/

348. The Archaeology of Caves in Ireland
https://caves.org/wp-content/uploads/Publications/JCKS/v78/cave-78-03-218.pdf

349. The Brown Bear (Ursus arctos L.) in Ireland
https://www.researchgate.net/publication/379235493_The_Brown_Bear_Ursus_arctos_L_in_Ireland

350. The Colonization of Ireland: A Human Ecology Perspective
https://doi.org/10.1016/j.quascirev.2020.106632

351. The Colonization of Ireland: A Human Ecology Perspective
https://www.sciencedirect.com/science/article/pii/S0277379120305941

352. The Colonization of Ireland: A Human Ecology Perspective
https://hungarcolab.weebly.com/uploads/1/3/0/2/130279092/tune_2020_-_colonization_of_ireland.pdf

353. The Colonization of Ireland: A Human Ecology Perspective
https://doi.org/10.1016/j.quascirev.2020.106620

354. The Colonization of Ireland: A Human Ecology Perspective
https://www.sciencedirect.com/science/article/abs/pii/S0277379120305941

355. The colonization of Ireland: A human ecology perspective
https://doi.org/10.1016/j.quascirev.2020.106480

356. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin
https://eprints.gla.ac.uk/213261/

357. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin
https://onlinelibrary.wiley.com/doi/full/10.1111/bor.12448

358. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to Its Terrestrial Margin
https://doi.org/10.1111/bor.12448

359. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin
https://eprints.whiterose.ac.uk/161427/1/bor.12448.pdf

360. The earliest evidence for anatomically modern humans in northwestern Europe
https://doi.org/10.1038/nature10484

361. The Earliest Evidence for Anatomically Modern Humans in Northwestern Europe
https://www.nature.com/articles/nature10484

362. The evolution of the terrestrial-terminating Irish Sea glacier during the last glaciation
https://doi.org/10.1002/jqs.3229

363. The evolution of the terrestrial-terminating Irish Sea glacier during the last glaciation
https://livrepository.liverpool.ac.uk/id/eprint/3093127

364. The evolution of the terrestrial-terminating Irish Sea glacier during the last glaciation
https://eprints.gla.ac.uk/221617/1/221617.pdf

365. The evolution of the terrestrial-terminating Irish Sea glacier during the last glaciation
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3229

366. The Evolution of the Terrestrial-Terminating Irish Sea Glacier During the Last Glaciation
https://eprints.whiterose.ac.uk/id/eprint/163650/

367. The Exploration of Castlepook Cave, Co. Cork
https://sources.nli.ie/Search/Versions?filter%5B%5D=format%3A%22Journal+Article%22&filter%5B%5D=topic_facet%3A%22Bats%22&filter%5B%5D=topic_facet%3A%22Caves%22&lookfor=%2A&type=AllFields

368. The Exploration of Castlepook Cave, Co. Cork. With 3 Plates
https://sources.nli.ie/Record/PS_UR_073459/Details?lng=en&print=1&sid=111354

369. The Exploration of Castlepook Cave, Co. Cork. With 3 plates.
https://sources.nli.ie/Record/PS_UR_073459

370. The Exploration of Castlepook Cave, County Cork
https://upload.wikimedia.org/wikipedia/commons/d/da/Proceedings_of_the_Royal_Irish_Academy_%28IA_proceedingsofro34roya%29.pdf

371. The exploration of Castlepook Cave, County Cork
https://upload.wikimedia.org/wikipedia/commons/a/a2/Geological_magazine_%28IA_geologicalmagazi651918wood%29.pdf

372. The Exploration of Castlepook Cave, County Cork, Being the Third Report from the Committee Appointed to Explore Irish Caves
https://www.jstor.org/stable/i20490272

373. The Exploration of the Caves of County Clare: Introduction, Remarks on Animal Remains and Summary of Results
https://sources.nli.ie/Record/PS_UR_089348

374. The Geological Heritage of Clare
https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Limerick_Audit.pdf

375. The Geological Heritage of County Leitrim
https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Leitrim_Audit.pdf

376. The Geomorphology of Ireland's Continental Shelf
https://doi.org/10.1080/17445647.2023.2283192

377. The Glacial Deposits of the Maguiresbridge Area
https://doczz.net/doc/7343058/the-glacial-deposits-of-the-maguires--bridge-area

378. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables
https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-approach-to-radiocarbon-calibration-curve-construction-a-new-methodology-using-bayesian-splines-and-errorsinvariables/FF2C650D3A7BBA277E9C51380BEC4050)

379. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables
https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-approach-to-radiocarbon-calibration-curve-construction-a-new-methodology-using-bayesian-splines-and-errorsinvariables/FF2C650D3A7BBA277E9C51380BEC4050

380. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables
https://doi.org/10.1017/RDC.2020.46

381. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables
https://eprints.gla.ac.uk/217180/

382. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://intcal.org/publications.html

383. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://www.cambridge.org/core/services/aop-cambridge-core/content/view/83257B63DC3AF9CFA6243F59D7503EFF/S0033822220000417a.pdf/div-class-title-the-intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-0-55-cal-kbp-div.pdf

384. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://doi.org/10.1017/RDC.2020.41

385. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-055-cal-kbp/83257B63DC3AF9CFA6243F59D7503EFF

386. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-055-cal-kbp/83257B63D55B31D67D02D770E73E65C0

387. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)
https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/20465/Reimer_2020_Radiocarbon_IntCal20_CC.pdf?sequence=1

388. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 kcal BP)
https://eprints.gla.ac.uk/210753/

389. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (open-access PDF)
https://pureadmin.qub.ac.uk/ws/portalfiles/portal/216486518/Reimer_Intcal20_RC2020.pdf

390. The Irish Quaternary Fauna Project
https://www.sciencedirect.com/science/article/pii/S0277379196000376

391. The Irish Quaternary Fauna Project
https://www.researchgate.net/publication/223448450_The_Irish_Quaternary_Fauna_Project

392. The Irish Quaternary Fauna Project
https://doi.org/10.1016/S0277-3791(96)00037-6

393. The Irish Quaternary Fauna Project
https://www.sciencedirect.com/science/article/abs/pii/S0277379196000376

394. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?
https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-78ce11d608ab

395. The Last Eurasian Ice Sheets – a Chronological Database and Time-Slice Reconstruction, DATED-1
https://doi.org/10.1111/bor.12142

396. The Last Glacial Maximum
https://doi.org/10.1126/science.1172873

397. The Last Glacial Termination in Northern Ireland
https://www.gsi.ie/en-ie/more-on-us/shop/geology-publications/Pages/default.aspx

398. The Last Irish Ice Sheet: Extent and Chronology
https://doi.org/10.2991/978-94-6239-219-9_5

399. The Last Irish Ice Sheet: Extent and Chronology
https://research-portal.st-andrews.ac.uk/en/publications/the-last-irish-ice-sheet-extent-and-chronology/

400. The Last Irish Ice Sheet: Extent and Chronology
https://doi.org/10.2991/978-94-6239-222-7_8

401. The Late-Glacial Sequence in Britain and Ireland
https://doi.org/10.1017/CBO9781316530368.005

402. The Late Quaternary History of East-Central Ireland
https://www.cambridge.org/core/journals/geological-magazine/article/abs/late-quaternary-history-of-eastcentral-ireland/0317E3C5FD4FBCDC0B2A8C2BB9EFD707

403. The Late Quaternary History of East-Central Ireland
https://doi.org/10.1017/S0016756800041704

404. Themes: Quaternary
https://gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/themes/

405. The Mesolithic in Ireland: When Was It?
https://www.heritagecouncil.ie/content/files/Our-Ancient-Landscapes-Hunter-Gatherers-in-Ireland.pdf

406. The nature of MIS 3 stadial–interstadial transitions in Europe: New insights from model–data comparisons
https://doi.org/10.1016/j.quascirev.2011.08.002

407. The Origin and Affinities of the Larnian Culture
https://www.cambridge.org/core/books/irish-stone-age/origin-and-affinities-of-the-larnian-culture/1ACA66F32A0AED44D355E3D3A77EA6A9

408. The problem of a late Quaternary landbridge between Britain and Ireland
https://www.sciencedirect.com/science/article/pii/0277379185900289

409. The Problem of a Late Quaternary Landbridge Between Britain and Ireland
https://doi.org/10.1016/0277-3791(85)90028-9

410. The Quaternary History of Ireland
https://catalogue.nli.ie/Record/vtls000090300

411. The Quaternary of the Irish Midlands
https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-21-300dpi-OCR.pdf

412. The Quaternary of Western Ireland
https://www.geologicalsurvey.ie/sites/default/files/2020-06/IQUA%20INQUA%202019%20Field%20Guide%20preGL2%20The%20Quaternary%20of%20Western%20Ireland.pdf

413. The Quaternary Period in Ireland—An Assessment, 1960
https://doi.org/10.1080/00750776009555537

414. The Role of Ocean and Atmospheric Dynamics in the Marine-Based Collapse of the Last Eurasian Ice Sheet
https://doi.org/10.1038/s43247-022-00447-0

415. The Stratigraphic Position and Age of the Gortian
https://www.burrengeopark.ie/wp-content/uploads/2014/08/GSI-_The_Stratigraphic_Position_and_Age_of_the_Gor.pdf

416. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3611

417. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3611

418. The timing and magnitude of the British–Irish Ice Sheet between Marine Isotope Stages 5d and 2: implications for glacio-isostatic adjustment, high relative sea levels and 'giant erratic' emplacement
https://doi.org/10.1002/jqs.3611

419. The Tolsta Interstadial, Scotland: Correlation with D–O Cycles GI-8 to GI-5?
https://doi.org/10.1016/j.quascirev.2010.04.012

420. The 'Red Lady' Ages Gracefully: New Ultrafiltration AMS Determinations from Paviland
https://doi.org/10.1016/j.jhevol.2008.08.007

421. Timing, pace and controls on ice sheet retreat: an introduction to the BRITICE-CHRONO transect reconstructions of the British-Irish Ice Sheet
https://livrepository.liverpool.ac.uk/3124997/

422. Timing, Pace and Controls on Ice Sheet Retreat: An Introduction to the BRITICE-CHRONO Transect Reconstructions of the British–Irish Ice Sheet
https://nora.nerc.ac.uk/id/eprint/530451/

423. Timing, pace and controls on ice sheet retreat: an introduction to the BRITICE-CHRONO transect reconstructions of the British–Irish Ice Sheet
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3326

424. Timing, Pace and Controls on Ice Sheet Retreat: an Introduction to the BRITICE-CHRONO Transect Reconstructions of the British–Irish Ice Sheet
https://nora.nerc.ac.uk/530451/1/jqs.3326.pdf

425. Timing, Pace and Controls on Ice Sheet Retreat: An Introduction to the BRITICE-CHRONO Transect Reconstructions of the British–Irish Ice Sheet
https://doi.org/10.1002/jqs.3326

426. Timing and Pace of Ice-Sheet Withdrawal Across the Marine-Terrestrial Transition West of Ireland During the Last Glaciation
https://durham-repository.worktribe.com/output/1251075/timing-and-pace-of-ice-sheet-withdrawal-across-the-marine-terrestrial-transition-west-of-ireland-during-the-last-glaciation

427. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://mural.maynoothuniversity.ie/id/eprint/16633/1/OCofaighetal2021.pdf

428. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://doi.org/10.1002/jqs.3295

429. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://eprints.gla.ac.uk/234542/1/234542.pdf

430. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3295

431. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://eprints.gla.ac.uk/234542/

432. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation
https://onlinelibrary.wiley.com/doi/10.1002/jqs.3295

433. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland
https://onlinelibrary.wiley.com/doi/10.1111/bor.12109

434. Trimlines, blockfields and the vertical extent of the last ice sheet in southern Ireland
https://research-repository.st-andrews.ac.uk/handle/10023/6021

435. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland
https://doi.org/10.1111/bor.12109

436. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland
https://www.researchgate.net/publication/271141377_Trimlines_blockfields_and_the_vertical_extent_of_the_last_ice_sheet_in_Southern_Ireland

437. UCD School of Archaeology Research Day 2022
https://www.ucd.ie/archaeology/t4media/UCD_Archaeology_Research_Day_2022.pdf

438. Using novel methods to track British and Irish Ice Sheet dynamics since the Late Pleistocene, along the west Porcupine Bank, NE Atlantic
https://doi.org/10.1016/j.quascirev.2022.107463

439. Using Novel Methods to Track British and Irish Ice Sheet Dynamics Since the Late Pleistocene, Along the West Porcupine Bank, NE Atlantic
https://www.sciencedirect.com/science/article/pii/S0277379122000944

440. Variations in Esker Morphology and Internal Architecture Record Time-Transgressive Changes in Subglacial Hydrology
https://pureadmin.qub.ac.uk/ws/portalfiles/portal/239718299/Stokeretal_PGA.pdf

441. Vertical Dimensions and Age of the Wicklow Mountains Ice Dome, Eastern Ireland, and Implications for the Extent of the Last Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2006.01.026

442. Vertical Dimensions and Age of the Wicklow Mountains Ice Dome, Eastern Ireland, and Implications for the Extent of the Last Irish Ice Sheet
https://www.sciencedirect.com/science/article/pii/S0277379106000692

443. Vertical Dimensions and Age of the Wicklow Mountains Ice Dome, Eastern Ireland, and Implications for the Extent of the Last Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2006.03.033

444. Vertical dimensions and age of the Wicklow Mountains ice dome, Eastern Ireland, and implications for the extent of the last Irish Ice Sheet
https://doi.org/10.1016/j.quascirev.2006.07.012

445. What Was on the Menu in Prehistoric Ireland?
https://www.rte.ie/brainstorm/2025/0815/1475736-prehistoric-ireland-food-mesolithic-iron-age-bronze-age/

Index

Aghnadarragh, 3020, 3163–3164, 3196, 3198, 3254, 3312, 3346

Agriculture, 2993, 3065, 3069, 3105, 3112, 3125, 3166, 3209, 3228, 3247, 3251, 3267, 3279, 3307, 3311, 3342

Antrim, 3007, 3164, 3254, 3312

Birm-166, 2980, 2991, 2996, 3003, 3015, 3019–3020, 3027, 3048, 3052, 3060, 3071, 3083, 3087, 3099, 3111, 3120, 3127, 3135, 3143–3144, 3147, 3151, 3155, 3159, 3171, 3176, 3183, 3187, 3192, 3208, 3210, 3214, 3222, 3227, 3230, 3234, 3239, 3253, 3258, 3273, 3277, 3289, 3306, 3309, 3325, 3332, 3336, 3340, 3357

Bogbean, 2977, 2981, 2987, 2992, 3008, 3012, 3016, 3020, 3051–3052, 3054, 3060, 3068, 3071, 3074, 3080, 3084, 3088, 3098, 3104, 3108, 3112, 3116, 3136, 3141, 3144, 3152, 3156, 3159–3162, 3169, 3172, 3176, 3184, 3186, 3188, 3197, 3200, 3211, 3215, 3219, 3230–3231, 3233, 3235, 3239, 3243, 3246, 3254, 3256, 3262, 3274, 3278, 3282, 3290, 3302, 3310, 3318, 3330, 3337, 3339, 3349, 3356–3357, 3359

Castlepook, 2977–2979, 2981–2986, 2988–2990, 2992–2994, 2997–2998, 3000–3002, 3004–3005, 3008–3010, 3012–3013, 3017–3018, 3021–3022, 3024–3026, 3029–3034, 3036–3038, 3040–3042, 3045–3046, 3049–3050, 3052–3059, 3061–3062, 3064–3066, 3068–3069, 3072–3082, 3085–3098, 3101–3102, 3105–3110, 3112–3114, 3116–3118, 3120–3125, 3128–3130, 3132–3134, 3137–3142, 3144–3146, 3148–3150, 3152–3154, 3156–3157, 3160–3162, 3164–3174, 3176–3177, 3181, 3185–3186, 3188–3190, 3192–3198, 3201, 3205, 3208–3209, 3212–3213, 3215–3217, 3219–3220, 3223–3225, 3227–3229, 3232, 3235–3237, 3239–3240, 3243–3244, 3246–3248, 3250–3251, 3255, 3257–3260, 3262–3263, 3266–3272, 3274–3279, 3282–3284, 3286–3288, 3290–3291, 3293–3304, 3306–3307, 3309–3324, 3326–3328, 3330–3335, 3337–3339, 3341–3343, 3345–3358, 3361–3363, 3365, 3368–3370

Clare, 2978, 2986, 2989, 2997, 3021, 3026, 3033, 3041, 3044, 3057, 3069, 3077, 3081, 3105, 3109, 3133, 3153, 3157, 3169, 3181, 3189, 3196, 3224, 3228, 3259, 3263, 3267, 3275, 3279, 3283, 3290, 3311, 3331, 3334, 3338, 3347, 3350, 3354, 3365, 3369

County Fermanagh, 2976, 2980, 2984, 2987, 2991, 2995–2996, 3003–3004, 3008, 3012, 3015, 3020, 3023, 3027, 3031, 3039, 3044, 3048, 3051, 3060, 3064, 3068, 3071, 3080, 3083, 3087, 3091, 3098–3100, 3104, 3107, 3111, 3115, 3120, 3124, 3127, 3131, 3135, 3139–3140, 3143, 3147–3148, 3151, 3155, 3159, 3164, 3169, 3171, 3176, 3180, 3183, 3187, 3191, 3196, 3199, 3204, 3208, 3210, 3214, 3218, 3222, 3227, 3230, 3234, 3238, 3242, 3245, 3250, 3253, 3257, 3261, 3270, 3273, 3277, 3281, 3286, 3289, 3302, 3306, 3309, 3314, 3318, 3325, 3330, 3332, 3336, 3340, 3348–3349, 3354, 3356, 3361

Crag Cave, 2988, 2990, 3016, 3018, 3024, 3026, 3032, 3034, 3084, 3086, 3101, 3144, 3146, 3169, 3172, 3179–3180, 3200, 3203–3205, 3254, 3270, 3341

Derryvree, 2976–2977, 2979–2982, 2984–2988, 2990–2996, 2998, 3003–3004, 3008, 3012, 3015–3016, 3018, 3020, 3022–3023, 3026–3034, 3039–3040, 3042–3044, 3046, 3048, 3050–3052, 3054, 3060, 3062, 3064, 3066–3069, 3071–3074, 3080, 3082–3088, 3090–3094, 3098–3102, 3104, 3107–3108, 3110–3112, 3115–3116, 3118, 3120, 3124, 3127–3136, 3138–3144, 3146–3153, 3155–3156, 3159–3161, 3164, 3169, 3171–3177, 3180, 3183–3184, 3186–3194, 3196–3200, 3204–3205, 3208, 3210–3215, 3217–3219, 3222–3223, 3225, 3227, 3229–3231, 3233–3239, 3241–3246, 3248, 3250, 3253–3254, 3257–3258, 3261–3264, 3270, 3273–3279, 3281–3286, 3288–3291, 3302, 3306–3307, 3309–3310, 3312, 3314–3316, 3318, 3320, 3325–3326, 3328–3333, 3335–3337, 3339–3343, 3349, 3351, 3354, 3356–3358, 3361, 3363

Donegal, 3084, 3092, 3095–3096, 3104

Doneraile, 2977, 2981, 2983, 2988, 2992, 2995, 2997, 2999–3000, 3004, 3007–3008, 3012, 3021, 3023–3024, 3026, 3029, 3032, 3036, 3040, 3045, 3049, 3052, 3056, 3061, 3064, 3068, 3072, 3075–3076, 3080, 3085, 3087, 3091, 3095–3096, 3105, 3108, 3112, 3116, 3120, 3124, 3128, 3132, 3137, 3139, 3144–3145, 3148, 3152, 3156, 3160, 3164, 3168, 3172, 3176–3177, 3181, 3185, 3188, 3192, 3196, 3201, 3205, 3208, 3212, 3216, 3219, 3223, 3227, 3232, 3235, 3239, 3243, 3246, 3250, 3255, 3257, 3262, 3266, 3269, 3274, 3277, 3282, 3286, 3290, 3294, 3297, 3302, 3306, 3310, 3314, 3318, 3322, 3330, 3333, 3337, 3341, 3345, 3349, 3353, 3356–3357, 3360–3361, 3365, 3369

Down, 2991, 3008, 3012, 3083, 3087, 3099, 3108, 3111, 3115, 3136, 3143, 3151, 3171, 3176, 3180, 3184, 3191, 3211, 3218, 3222, 3231, 3234, 3245, 3253, 3258, 3262, 3273, 3282, 3286, 3289, 3306, 3330, 3349, 3356, 3361

Dublin, 3193

Education, 3153

Flora, 2976, 2981, 2992, 2996, 3013, 3028, 3044, 3068, 3073, 3104, 3120, 3124, 3131, 3148, 3153, 3160, 3246, 3278, 3286, 3326, 3333

Galway, 2987, 3003, 3039, 3091, 3119, 3171, 3273, 3277, 3285, 3352, 3356

Geology, 3120, 3320

Glacial History, 3016, 3068, 3084, 3164, 3211, 3317, 3358

Hyenahall, 2997, 3000, 3013, 3032, 3061, 3120, 3207–3208, 3314, 3318

Irish language, 3025, 3041

Kerry, 2988, 2990, 3016, 3022, 3024, 3032, 3084, 3099, 3143–3144, 3169, 3172, 3180, 3182, 3199–3200, 3202, 3204, 3254, 3270, 3341

Leitrim, 2980, 3242

Limerick, 3107, 3127, 3325, 3340

Maguirebridge, 3039, 3111, 3131, 3147, 3214, 3253, 3256, 3336

Mammoth Cave, 2981, 2983, 2988, 2992, 2997, 3000, 3004, 3008, 3012, 3024, 3029, 3032, 3036, 3040, 3045, 3049, 3056, 3061, 3064, 3072, 3076, 3080, 3096, 3101, 3103, 3105, 3108, 3112, 3116, 3128, 3132, 3137, 3139, 3148, 3152, 3156, 3160, 3164, 3168, 3172, 3181, 3185, 3188, 3192, 3196, 3208, 3216, 3226–3227, 3229, 3232, 3246, 3250, 3265–3266, 3269, 3274, 3278, 3294, 3297, 3302, 3306, 3318, 3326, 3333, 3337, 3345, 3349, 3361, 3369

Mesolithic, 2982, 3000, 3026, 3029, 3057, 3133, 3169, 3173, 3220, 3247, 3268, 3270, 3287, 3294, 3307, 3338, 3367

Middle Midlandian, 2995, 3027, 3044, 3051, 3060, 3098, 3104, 3132–3133, 3151, 3153, 3164, 3171, 3192, 3197, 3242, 3249, 3274, 3286, 3290, 3309

Migration, 2986, 3004, 3025, 3038, 3053, 3107, 3113, 3128, 3141, 3145, 3149, 3169, 3177, 3189, 3198, 3232, 3258–3259, 3263, 3275, 3279, 3282, 3309, 3312, 3323, 3334, 3346, 3353, 3366

Munster, 3326

Music, 2998, 3009, 3037, 3077, 3089, 3129, 3149, 3204, 3220

Neolithic, 3307, 3367

Palaeoenvironment, 3000, 3011, 3064, 3163, 3199, 3251, 3296, 3320

Transport, 2977, 3000, 3013, 3032, 3044, 3072, 3105, 3113, 3117, 3144, 3161, 3168, 3172, 3204, 3220, 3267, 3271, 3295, 3327, 3346, 3350, 3362, 3365

Waterford, 3125, 3164, 3344, 3347

Wexford, 3056

Wicklow, 3135, 3159, 3191, 3364, 3368

Discover Ireland Through the Pages of Emerald Gazette

Step into the remarkable world of Emerald Gazette, a publication series created for readers who want to experience Ireland's past through vivid storytelling, striking imagery and carefully researched historical features.

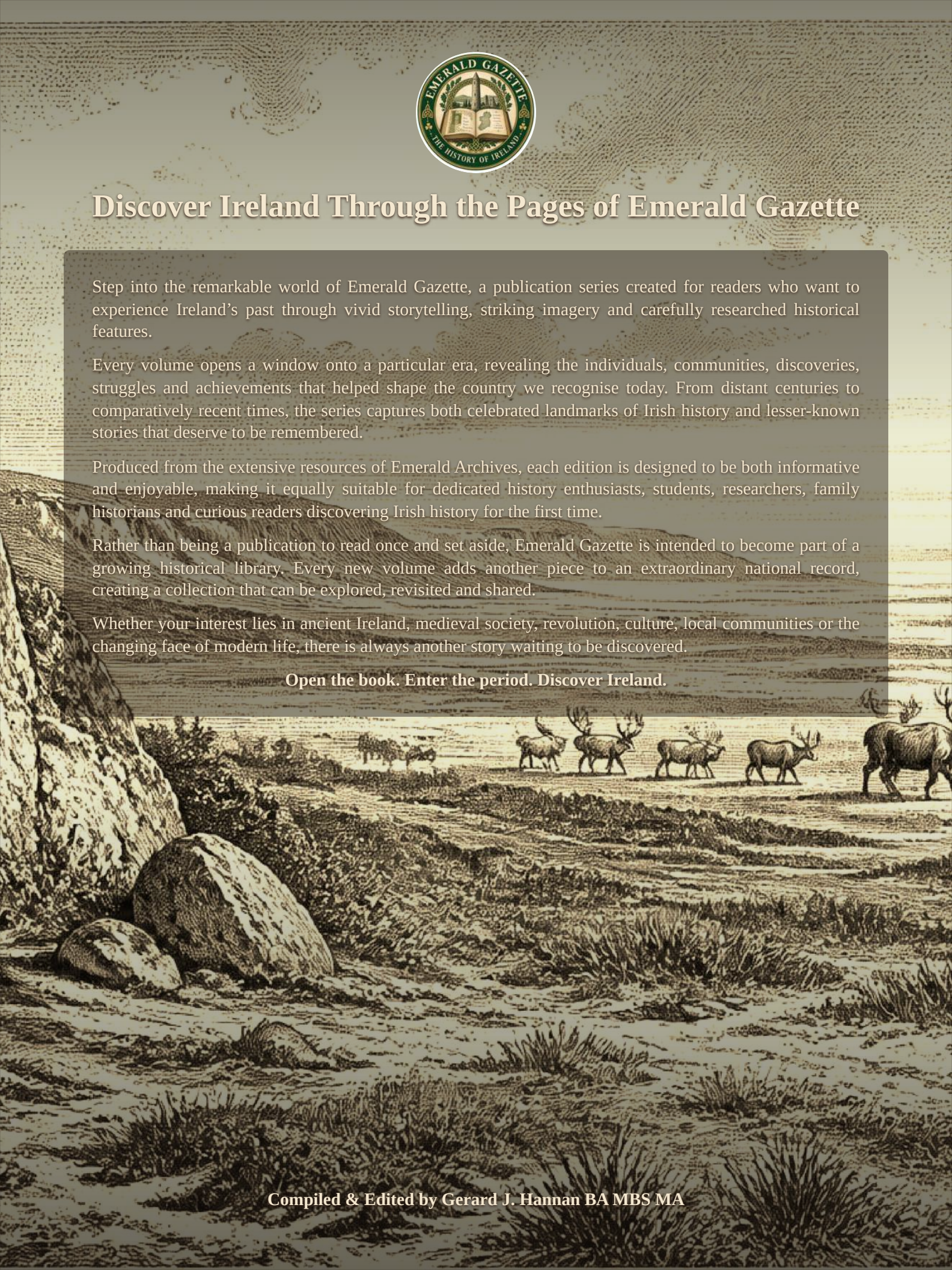
Every volume opens a window onto a particular era, revealing the individuals, communities, discoveries, struggles and achievements that helped shape the country we recognise today. From distant centuries to comparatively recent times, the series captures both celebrated landmarks of Irish history and lesser-known stories that deserve to be remembered.

Produced from the extensive resources of Emerald Archives, each edition is designed to be both informative and enjoyable, making it equally suitable for dedicated history enthusiasts, students, researchers, family historians and curious readers discovering Irish history for the first time.

Rather than being a publication to read once and set aside, Emerald Gazette is intended to become part of a growing historical library. Every new volume adds another piece to an extraordinary national record, creating a collection that can be explored, revisited and shared.

Whether your interest lies in ancient Ireland, medieval society, revolution, culture, local communities or the changing face of modern life, there is always another story waiting to be discovered.

Open the book. Enter the period. Discover Ireland.



Compiled & Edited by Gerard J. Hannan BA MBS MA