



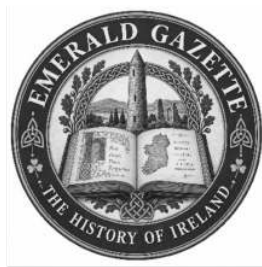
Emerald Gazette

Ireland 31700–31601 BCE

31700–31601 BCE

Issue 004 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



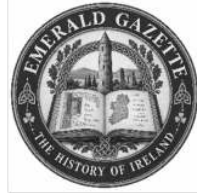
Emerald Gazette

Ireland 31700–31601 BCE

31700–31601 BCE

Issue 004 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



Emerald Gazette
Ireland 31700–31601 BCE
31700–31601 BCE
Issue 004 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

31700 BCE	1269	31661 BCE	1423
31699 BCE	1273	31660 BCE	1427
31698 BCE	1277	31659 BCE	1431
31697 BCE	1280	31658 BCE	1435
31696 BCE	1284	31657 BCE	1439
31695 BCE	1288	31656 BCE	1443
31694 BCE	1292	31655 BCE	1447
31693 BCE	1296	31654 BCE	1451
31692 BCE	1300	31653 BCE	1455
31691 BCE	1304	31652 BCE	1459
31690 BCE	1308	31651 BCE	1463
31689 BCE	1312	31650 BCE	1467
31688 BCE	1316	31649 BCE	1471
31687 BCE	1320	31648 BCE	1475
31686 BCE	1324	31647 BCE	1479
31685 BCE	1328	31646 BCE	1483
31684 BCE	1332	31645 BCE	1487
31683 BCE	1336	31644 BCE	1491
31682 BCE	1340	31643 BCE	1495
31681 BCE	1344	31642 BCE	1499
31680 BCE	1348	31641 BCE	1503
31679 BCE	1352	31640 BCE	1507
31678 BCE	1356	31639 BCE	1511
31677 BCE	1359	31638 BCE	1515
31676 BCE	1363	31637 BCE	1519
31675 BCE	1367	31636 BCE	1523
31674 BCE	1371	31635 BCE	1527
31673 BCE	1375	31634 BCE	1531
31672 BCE	1379	31633 BCE	1535
31671 BCE	1383	31632 BCE	1539
31670 BCE	1387	31631 BCE	1543
31669 BCE	1391	31630 BCE	1547
31668 BCE	1395	31629 BCE	1551
31667 BCE	1399	31628 BCE	1555
31666 BCE	1403	31627 BCE	1559
31665 BCE	1407	31626 BCE	1563
31664 BCE	1411	31625 BCE	1567
31663 BCE	1415	31624 BCE	1571
31662 BCE	1419	31623 BCE	1575

31622 BCE	1579
31621 BCE	1583
31620 BCE	1587
31619 BCE	1591
31618 BCE	1595
31617 BCE	1599
31616 BCE	1603
31615 BCE	1607
31614 BCE	1611
31613 BCE	1615
31612 BCE	1619
31611 BCE	1623
31610 BCE	1627
31609 BCE	1631
31608 BCE	1635
31607 BCE	1639
31606 BCE	1643
31605 BCE	1647
31604 BCE	1651
31603 BCE	1655
31602 BCE	1659
31601 BCE	1663

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.

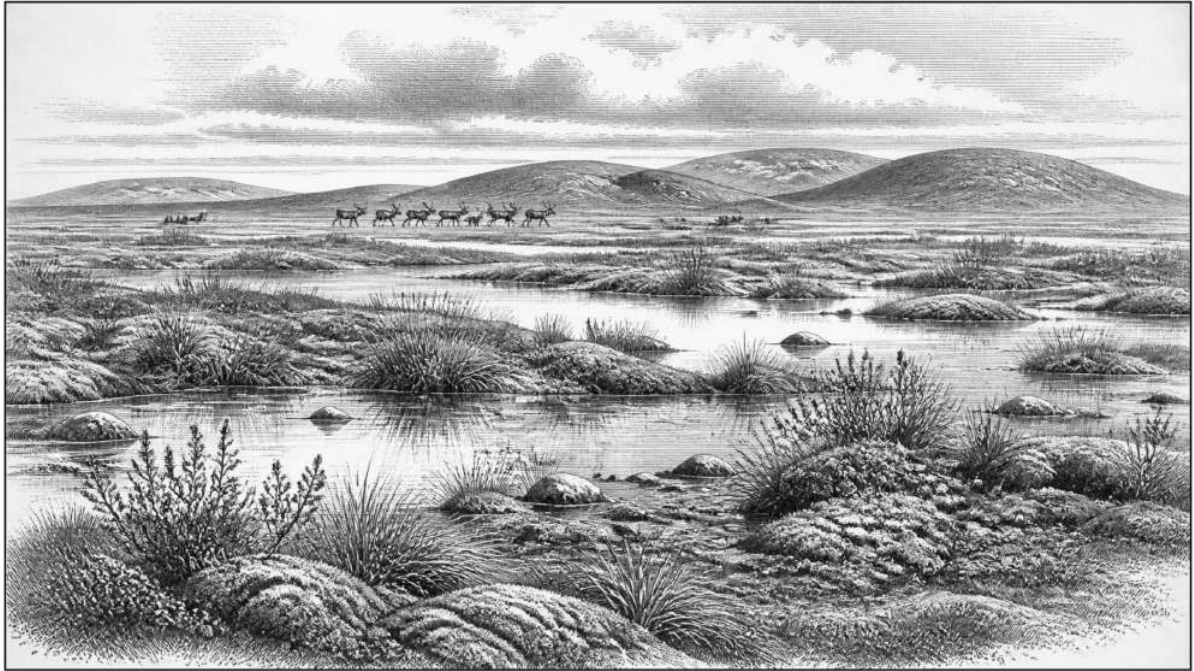
Every issue should therefore be understood both as an individual publication and as another chapter in a much larger project. Read separately, each volume offers a portrait of a particular historical period. Read together, the complete collection becomes an extended chronological journey through the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

31700 BCE

Derryvree's Freshwater Beds ^[1]



“31,700 BCE” is a modern chronological label, not a year that can be recovered from Irish evidence at annual precision. It corresponds roughly to 33,650 years before AD 1950, but neither archaeology nor palaeoclimate science can isolate an Irish event to that single year. The responsible setting is the later part of the Pleistocene, within Marine Isotope Stage 3 (MIS 3), a long and unstable phase of the last Ice Age. Evidence is dated by radiocarbon determinations, calibrated ranges, sediment sequences and changing animal distributions. It can illuminate an Ireland of cold landscapes and mobile wildlife; it cannot supply a dated ruler, battle, settlement foundation or diplomatic act.

The most closely relevant Irish chronological marker is not a monument but a layer of organic freshwater sediment exposed at Derryvree, near Maguiresbridge in County Fermanagh. This material lay between two deposits of glacial till in a road-cut through a drumlin. Its conventional radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP calibrates broadly to about 36.9–31.7 thousand calendar years BP. That calibrated interval spans approximately 34,950–29,750 BCE and therefore includes 31,700 BCE. It does not prove that the Derryvree pool existed in this precise named year; rather, it provides unusually close evidence for the kind of environment found in north-central Ireland during this part of MIS 3.

A Date Range, Not an Annal

This distinction matters. Radiocarbon years are not the same as calendar years, because atmospheric carbon-14 has varied through time. Calibration curves such as IntCal20 convert measurements into probability ranges, and uncertainty increases at this depth of time. Further complications arise because a sample dates the death of an organism or the formation of a deposit, not necessarily the human or animal

activity with which it may later be associated. A calendar-year article can therefore offer a carefully bounded portrait of conditions around the date, but it must not pretend that 31,700 BCE has the documentary clarity of a medieval annal.

Ireland at this horizon was not yet at the maximum of the last glaciation. The Last Glacial Maximum is generally placed at about 26,500–19,000 calendar years BP, substantially later than this article's notional date. There were already cold conditions, local and regional ice advances, and severe environmental fluctuations; yet the Derryvree evidence, alongside other pre-maximum deposits, shows that at least parts of the island could be ice-free during intervals of the preceding millennia. The advance that later reshaped much of Ireland's surface was approaching in geological terms, but it had not erased every terrestrial habitat.

Water Among the Drumlins

Derryvree is valuable precisely because it preserves a fleeting non-glacial episode between two episodes of ice deposition. Its fine sands and organic silts record freshwater conditions rather than an uninterrupted frozen wasteland. Plant and insect evidence has been interpreted as indicating an open tundra landscape and a muskeg-like wetland: mossy, plant-rich ground with shallow pools. The setting was harsh, with long cold winters, but it was not biologically empty. Low vegetation, wet hollows and open water offered resources for insects, birds and mammals, while the surrounding ground supported the sparse plant communities characteristic of cold Late Pleistocene environments.

Such evidence corrects an easy but misleading image of Ice Age Ireland as uniformly entombed beneath ice. Conditions changed repeatedly, sometimes on timescales shorter than the broad archaeological periods used in popular history. A freshwater basin in Fermanagh does not describe all regions at once. Upland ground, western coasts, river valleys and limestone districts responded differently to snowfall, permafrost, drainage and ice movement. Nevertheless, Derryvree establishes the essential point: during part of the broad interval embracing 31,700 BCE, northern Ireland included ice-free ground capable of sustaining wetland vegetation and animal life.

Before the Great Ice Advance

The later Irish Ice Sheet would cover much, perhaps nearly all, of the island during the Last Glacial Maximum and would abrade or bury vast quantities of earlier evidence. That destructive legacy is one reason Ireland's deep Palaeolithic record is so thin. Surface camps, hearths, tools, butchered carcasses and tracks may have been removed, redeposited or now lie beneath later sediments and seas. Caves and protected sub-till deposits have consequently assumed exceptional importance. They are not comprehensive archives, but they preserve fragments that open-air landscapes usually lost.

At Greenagho, also in County Fermanagh, organic material from a lacustrine deposit beneath till produced a calibrated range of roughly 37.2–35.7 thousand calendar years BP. Together with Derryvree, it indicates that north-central Ireland retained ice-free environments before the major late-glacial build-up. Glacial reconstructions differ in detail, especially for the earlier part of the cycle, but they agree that the ice sheet's fullest expansion belongs later. Around 31,700 BCE, Ireland should therefore be understood as a changing cold-region landscape, not as the familiar wooded island and not simply as a map of fixed ice margins.

Animals at Castlepook

County Cork provides the principal faunal counterpart to Fermanagh's wetland evidence. Castlepook Cave, near Doneraile in the Blackwater catchment, is Ireland's richest known cave archive for vertebrate life before the Last Glacial Maximum. Excavations in the early twentieth century recovered a large and chronologically mixed collection from chambers later given memorable names such as Elephant Hall and Hyenahall. Revised radiocarbon work has demonstrated that several older measurements underestimated the true ages of the bones. The cave's dated remains now document a long span of Pleistocene animal presence rather than a single occupation episode.

Its fauna includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena; later material includes wolf, Arctic fox and lemmings. These animals were not all necessarily present in the same season, century or landscape patch. Nor does a bone in a cave automatically mean that people hunted it there. Carnivores could carry remains into dens, animals could die naturally, water could move material, and early excavators did not record deposits to modern standards. Still, the assemblage establishes that Ireland supported a richer cold-climate mammal community than survives in its later historic fauna. Large herbivores and predators formed part of the ecological world against which any human visitor would have moved.

The Human Question

One Castlepook object has made 31,700 BCE especially significant in public discussion: a reindeer femur bearing a deep incision interpreted by zooarchaeologist Ruth Carden as a cut or chopping mark made with a sharp stone implement during carcass processing. The bone has been reported as dating to about 33,000 years ago. If the mark is genuinely anthropogenic and broadly contemporary with the animal's death, it may be evidence that people handled reindeer in Ireland far earlier than the formerly accepted terminal-Pleistocene traces. It would place a human episode within the wider Late Upper Palaeolithic world of north-west Europe.

The proper conclusion remains cautious. The femur came from an old cave collection, not a securely excavated camp-floor associated with a stone-tool assemblage, hearth, shelter, repeated activity surfaces or human remains of comparable age. Its date is not a date for the incision itself, and the cave was affected by carnivores, water and antiquarian excavation. The find is consequently best treated as important possible evidence of Palaeolithic butchery, not proof of permanent settlement, a named population, or continuous human occupation of Ireland. Ongoing investigation at Castlepook seeks surviving deposits that may test such claims with modern excavation methods.

Life Without a Recorded Society

If people did enter Ireland during this broad period, the available evidence suggests short, mobile forays rather than established villages. Reindeer and other large herbivores could have provided meat, fat, hide, sinew, antler and bone; wetlands could have supplied seasonal birds, plant foods and fresh water. These are reasonable ecological possibilities, not demonstrated facts about a particular Irish group. No securely dated Irish dwelling, hearth, lithic workshop, burial, ornament, art object or food store is known from around 31,700 BCE. There is likewise no evidence for farming, herding, pottery, metalworking, writing or a settled economy.

For the same reason, political affairs, warfare, diplomacy, formal religion and named cultural institutions cannot responsibly be reconstructed. A lone modified bone cannot disclose leadership, kinship, language, territory, ritual or relations between groups. Continental Europe did contain Upper Palaeolithic hunter-gatherer populations, and the Gravettian was emerging across parts of western and central Europe around this broad timescale. Ireland, however, has yielded no diagnostic artefact assemblage allowing its inhabitants or visitors to be assigned to that tradition. Continental comparison supplies context, never an Irish identity.

Connections and Separation

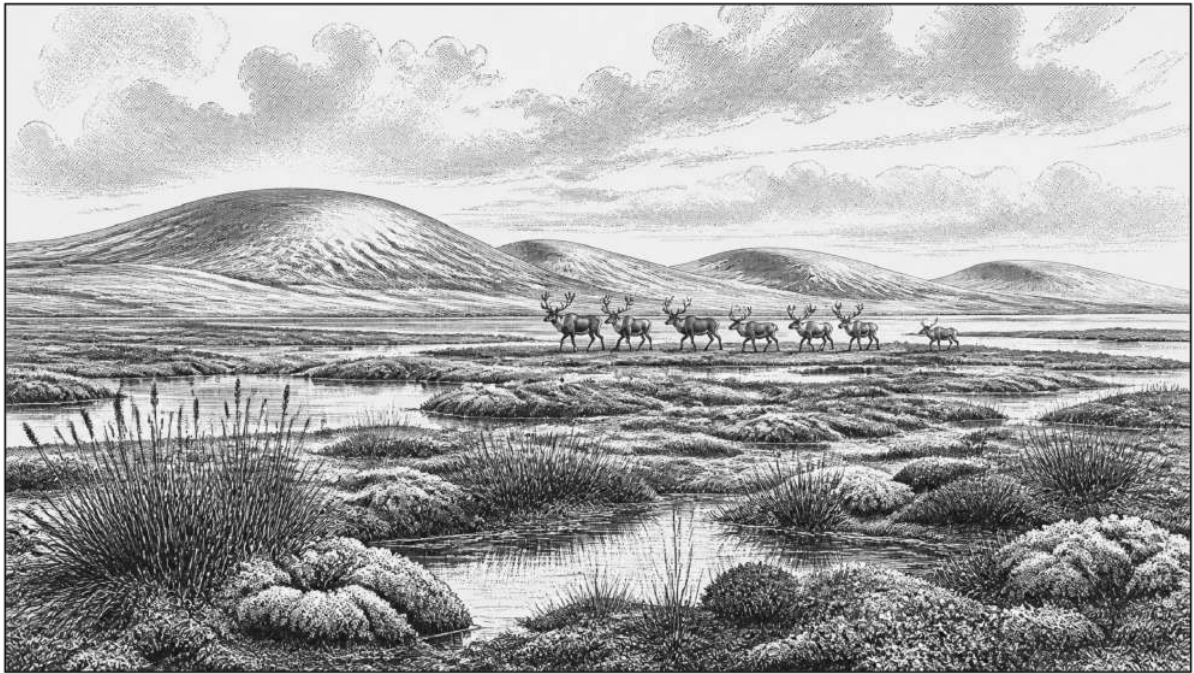
Lower sea levels during the Ice Age altered the outlines of the Irish Sea basin and could expose land now submerged, but the exact routes available at any moment depended on sea level, ice extent, rivers and local topography. Later Last Glacial Maximum reconstructions show broad exposed shelves and possible land connections, yet it is unsafe to project a simple, permanent “land bridge” backwards onto 31,700 BCE. The presence of cold-adapted mammals nevertheless demonstrates that Ireland was connected, directly or indirectly over time, to wider British and European animal populations. Faunal arrival is evidence of biogeographical connection, not of a mapped human road.

The greatest development around 31,700 BCE was therefore environmental rather than political: an island region still capable, in some districts, of supporting tundra wetlands and Pleistocene mammals, while the climatic trajectory was moving towards more extensive ice. Derryvree’s freshwater beds and Castlepook’s bones are small survivals from that vulnerable world. They show why Ireland’s earliest human story must be written with restraint: the landscape and fauna are real, a human presence is possible and perhaps momentarily visible, but the people themselves remain almost entirely beyond recovery.

Chapter 002 of 100

31699 BCE

Derryvree's Sedge Muskeg^[2]



“31,699 BCE” is a modern chronological label, not a year that anyone in prehistoric Ireland could have recognised or recorded. At this depth of time, calendar-year precision is unavailable. The responsible approach is to place the date within broad, calibrated ranges and to distinguish what survives as evidence from what archaeologists infer. Around this point—roughly 33,650 calendar years before present, counting “present” as 1950—Ireland lay within Marine Isotope Stage 3, a cold and unstable part of the last Ice Age. It was not yet the uniformly ice-covered Ireland of the Last Glacial Maximum, but neither was it a familiar green island.

A Date Within a Range

The most useful Irish environmental evidence comes from Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands trapped between two layers of glacial till within a drumlin. The organic deposits produced a radiocarbon determination of $30,500 \pm c.1,100$ radiocarbon years before present. When calibrated, that determination has been expressed as a wide range of approximately 36.9–31.7 thousand calendar years before present. The modern date 31,699 BCE falls near the younger end of that range, but it cannot be narrowed to a season, generation or individual year.

This is more than a technical warning. Radiocarbon years are not calendar years, because atmospheric carbon-14 levels have varied over time. For periods older than the last tree-ring sequence, calibration relies on combined evidence from floating tree rings, cave deposits, lake and marine sediments, and corals. The resulting ranges remain substantial. Derryvree therefore offers a window onto an interval around the requested date, rather than a snapshot taken in 31,699 BCE itself.

Freshwater Beneath the Drumlin

Derryvree's significance lies in its unlikely survival. A later ice advance covered and sealed the freshwater deposits, preserving plant remains, pollen, mosses and insect evidence beneath glacial sediment. These remains indicate a cold, open, periglacial landscape: one shaped by severe seasonal conditions around ice margins, rather than necessarily by permanent frozen ground everywhere. The deposits have often been described as a muskeg, a wet, moss-rich mire with shallow pools and waterlogged ground.

The vegetation was treeless or nearly so. Grasses and sedges were important, while the broader fossil assemblage includes mosses and hardy plants suited to exposed, wet and cold ground. Such evidence does not support a continuous forest, settled farmland or the blanket bogs that now form part of Ireland's visual identity. It instead suggests patchy tundra-like vegetation, damp hollows and freshwater channels amid open ground. The precise mixture would have shifted with local drainage, slope, snow cover and short-lived climatic fluctuations.

Regional evidence reinforces this picture while also showing why no single site should stand for the whole island. Organic deposits at Greenagho, also in Fermanagh, have yielded a radiocarbon age of $32,500 \pm 300$ radiocarbon years before present, calibrated to roughly 37.2–35.7 thousand calendar years ago. At Hollymount and Aghnadarragh, fossil pollen and beetles likewise point to cold, open environments during earlier parts of the Midlandian glacial stage. Together, these sites demonstrate that parts of northern Ireland retained ice-free landscapes during phases of the last glacial cycle. They do not prove that every valley, coast or upland was simultaneously free of ice.

An Uneven Ice Age Island

In later millennia, the British–Irish Ice Sheet expanded dramatically. Its maximum extent and later retreat were not synchronous across Ireland, Britain and the surrounding continental shelf. Modern reconstructions emphasise advancing and retreating ice margins, shifting ice divides and substantial regional variation, rather than a simple image of an island suddenly swallowed by one static sheet. Around the Derryvree interval, the evidence is consistent with at least parts of north-central Ireland remaining ice-free, although glaciers and ice sheets were important nearby forces and would later overrun the landscape.

The land itself was also physically different. Global sea level was lower than today because immense quantities of water were locked in continental ice. Wider coastal plains and sections of the continental shelf were exposed in the north-west European region. Yet lower sea level should not be turned into an automatic “land bridge” to Ireland. The form, timing and passability of routes across the Irish Sea and North Channel remain complicated questions. Any people or animals reaching Ireland may have moved through changing mosaics of land, estuary, river, sea ice and water crossings; the evidence does not permit a single confident route.

The Nadd Valley Fauna

The principal animal archive for this broad era is Castlepook Cave—historically called Mammoth Cave—near Doneraile in north County Cork. Excavations undertaken in the early twentieth century produced an extraordinary cave collection, including remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, spotted hyaena and lemmings. The cave is therefore essential evidence that Ice Age mammals reached Ireland during the Middle and Late Pleistocene.

But a cave collection is not a census of one moment. Bones may have been brought in by hyaenas and other carnivores, washed through passages, mixed by burrowing and erosion, or disturbed by excavation long before modern recording standards. Later research has also shown that some older radiocarbon results require reassessment: improved pretreatment and accelerator dating can produce significantly older ages. Ruth Carden and colleagues concluded that several southern Irish MIS 3 animal dates were older than previously thought, and suggested that some species, including giant deer and spotted hyaena, may have disappeared locally before about 40,000 calibrated years ago.

That caution matters at 31,699 BCE. Mammoth, hyaena and giant deer are part of Ireland's wider Ice Age record, but it cannot safely be claimed that all stood together on the same Cork hillside in this specific notional year. Reindeer, however, are particularly relevant to the open, cold environments indicated by Derryvree. Their presence implies a landscape capable of supporting mobile grazing herds, though the size, seasonality and routes of those herds cannot be recovered from the surviving bones.

The Marked Reindeer Bone

One Castlepook object has transformed discussion of early human activity. A reindeer femur in the National Museum of Ireland's natural-history collections bears a deep linear modification interpreted by zooarchaeologist Ruth Carden as a mark made with a sharp stone implement during carcass processing. County Cork heritage material has presented it as evidence of Stone Age hunters in the region around 31,000 BCE. If that interpretation is confirmed, it would be a remarkable indication that people reached Ireland far earlier than the island's long-established post-glacial archaeological record.

Its limitations must be stated equally clearly. The bone derives from an old cave collection, not a modern excavation of an intact occupation surface. The date obtained from a bone establishes when the animal died within a radiocarbon range; it does not directly date the mark, identify its maker, prove where the animal was killed or show how long people stayed. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, art or repeated sequence of human occupation of comparable age has yet been published from Castlepook. Carnivore activity and cave processes make interpretation especially demanding.

The marked femur is therefore best treated as possible, highly important evidence of a brief Upper Palaeolithic human visit or episode of butchery. It is not proof of a permanent population, a village, continuous settlement or a direct ancestral community behind later Irish prehistory. The more securely documented humanly modified bear bone from Alice and Gwendoline Cave in County Clare belongs much later, in the terminal Pleistocene, around 12,800–12,600 calendar years before present.

What Society Cannot Yet Be Seen

No political affairs, diplomacy, named leaders, territories or warfare can be responsibly assigned to Ireland at this date. Nor is there evidence for religion, formal ritual, language, trade networks, houses, clothing or teaching. These absences are not proof that no people ever arrived; they reflect the exceptional thinness of the archaeological record and the destructive power of subsequent glaciation, coastal change and cave disturbance.

If the Castlepook mark was made by people, the minimum inference is modest: one or more individuals possessed and used a sharp stone edge on a reindeer carcass. In the wider Upper Palaeolithic world, hunter-gatherers organised their lives around mobility, shared knowledge, kin connections and seasonal resources. It is reasonable to regard any Irish visitors as part of those wider north-west European

worlds, but it is not evidence that their particular social practices, beliefs or origins can be identified here. Even the activity represented by the mark—meat removal, hide working, tendon collection or access to marrow—cannot be fixed with certainty.

Before the Great Advance

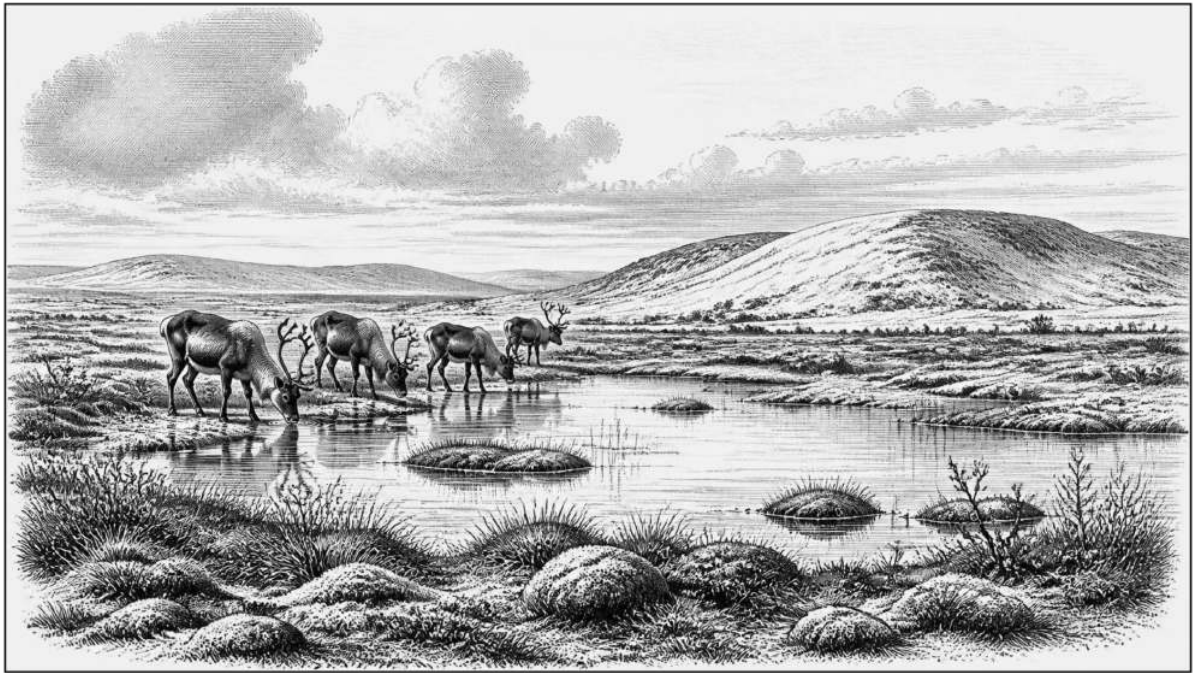
The strongest story for Ireland around 31,699 BCE is environmental, not political. Derrynree preserves a cold wetland of sedges, mosses and open water in a landscape later sealed beneath ice. Castlepook preserves a scattered, time-averaged record of Ice Age animals and one provocative possible trace of human butchery. Together they show that Ireland was neither empty geological abstraction nor recognisably modern country: it was an ecologically connected but unstable western edge of Ice Age Europe.

That distinction is the period's central lesson. Evidence supports ice-free ground in some Irish regions, freshwater habitats in Fermanagh and the arrival of cold-adapted mammals in the island's wider landscape. Interpretation allows the possibility of fleeting human movement alongside or behind reindeer herds. It does not licence a settled prehistoric Ireland in this year. Future excavation of undisturbed cave deposits, improved microscopic study of modified bones and further dating may alter the balance of evidence. For now, Derrynree's buried sedge muskeg remains the clearest local witness to the world around this remote date.

Chapter 003 of 100

31698 BCE

Birm-166's Sedge Record^[3]



31,698 BCE cannot be treated as a recoverable year in the modern sense. No Irish written record, settlement layer, named community or datable human action belongs securely to that precise point. It is a retrospective calendar label for roughly 33,650 years before 1950, during the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3). The responsible evidence is therefore regional and ranged, not annual. A particularly important guide is a calibrated range of about 36,900–31,700 years before present from organic deposits at Derryvree, near Maguiresbridge in County Fermanagh: a range that encompasses this notional date, but does not turn it into an historical anniversary.

A Wetland Between Ice Advances

Derryvree was revealed in a 1969 road cutting through a drumlin. Beneath one body of glacial till and above another lay fine sands and organic-rich silts: the remains of a freshwater environment preserved between episodes of ice-sheet activity. The laboratory determination known as Birm-166 gave an age of about 30,500 radiocarbon years before present. Radiocarbon years are not calendar years, and modern calibration produces the broader range used by later researchers. That distinction matters. The deposit supplies evidence that this part of Fermanagh was ice-free during some portion of the range, not proof that conditions were identical throughout it or on every part of Ireland.

The plants and insects in the silts indicate a cold, open, periglacial setting. Freshwater mosses and sedges grew around shallow water; the assemblage also included plants such as bogbean. This was not a wooded Irish countryside of the familiar modern kind. Trees, if present locally at all, were not forming a closed forest in this exposed landscape. The word “tundra” is useful as a broad description of open, cold-

climate vegetation, but it should not conjure an exact replica of present-day Arctic terrain. The deposits record a particular lowland wetland and its catchment, shaped by temperature, seasonality, sediment movement and water supply.

An Unstable Ice-Age Ireland

Around this horizon, Ireland stood before the fullest growth of the last Irish Ice Sheet, whose maximum overall expansion came later, during the Last Glacial Maximum. Yet this was no simple interval of thaw. MIS 3 was marked by abrupt climatic oscillations, and evidence from Crag Cave in County Kerry shows that calcite growth in Irish caves occurred episodically during milder intervals when water could circulate through the limestone. Such speleothems are a valuable climatic archive, but they do not provide a weather report for Maguiresbridge on a particular day or year.

Other sites reinforce the picture of uneven regional change. Organic and freshwater deposits at Greenagho near Belcoo, also in Fermanagh, have been assigned a calibrated age roughly between 37,200 and 35,700 years before present, though the limitations of older conventional radiocarbon determinations require caution. Hollymount near Maguiresbridge and Aghnadarragh in County Antrim preserve further sediment sequences between tills. Together they demonstrate that ice advances were separated by episodes in which water, plants and animals occupied exposed ground. They do not license a neat map of a single national ice margin for 31,698 BCE.

Animals, Caves and Caution

The most dramatic evidence for pre-Last Glacial Maximum Ireland comes from limestone caves in north County Cork, above all Castlepook Cave near Doneraile, also known as Mammoth Cave. Excavations from the nineteenth and early twentieth centuries recovered an exceptionally large but disturbed collection of animal remains. Work associated with the Irish Quaternary Fauna Project, and later re-dating, has shown that mammals reached Ireland during the wider period from at least about 45,000 to 20,000 years ago. Castlepook's assemblage includes remains attributed to reindeer, brown bear, wolf, fox, hare, lemming, giant deer, woolly mammoth and spotted hyaena.

That list is evidence for a changing regional fauna across a long span, not a census of animals alive together in 31,698 BCE. Cave deposits can be mixed by water, scavenging, collapse, earlier digging and later disturbance; old collections often lack the fine-grained excavation records now expected. Re-dating has also revised the apparent ages of some southern Irish specimens substantially. The most secure conclusion is that parts of Ireland could support, or were reached by, a diverse cold-stage mammalian fauna during MIS 3. The timing, duration and precise geographical range of each species remain subjects for continued testing.

This caution is essential to the question of people. A reindeer femur from Castlepook has been interpreted as bearing a cut made by a sharp stone tool, raising the possibility of human carcass processing in Ireland around 33,000 years ago. It is an important claim, but not conclusive proof of a resident population. A bone date establishes when the animal lived; it does not automatically date a mark, identify its maker beyond doubt, or demonstrate a camp, family group or continuing occupation. New fieldwork at Castlepook has located Pleistocene bone-bearing deposits in less disturbed parts of the cave system, offering a better prospect of resolving such questions.

No Politics, No Proven Diplomacy

There is no evidence from Ireland at this date for political institutions, territories, rulers, warfare, diplomacy, religious buildings, formal burial or organised trade. It would be misleading to fill those silences with imagined Ice-Age clans. If people did reach the island or its near shores, they may have been highly mobile hunter-gatherers making brief forays rather than establishing permanent settlements. Even that is interpretation rather than settled fact. No securely associated house floor, hearth, stone-tool assemblage or human remains permits a reconstruction of everyday social life around this point.

Nor can historians responsibly infer long-distance exchange from the animal evidence. Lower global sea levels exposed large areas of the continental shelf, altering coastlines and the distances between landmasses, but sea level, glacial barriers and channels did not create a straightforward, demonstrated land bridge from Ireland to Britain or continental Europe. The routes by which animals entered Ireland are still debated. They could have depended on temporary coastal corridors, sea crossings, changing ice conditions or combinations of these. Human access, were it demonstrated, would demand its own evidence.

What Survival Required

The Derrynree record nevertheless permits a restrained picture of the non-human economy of the landscape. Wet ground supported aquatic and marginal plants; open vegetation offered seasonal grazing and browsing opportunities; lakes, streams and wet hollows created ecological variation in an otherwise sparse environment. Carnivores, scavengers and herbivores left traces in caves because caves could act as dens, traps, shelters, sediment sinks and repositories of bones washed in from outside. Their remains tell us more reliably about animal communities and environment than about human culture.

For any visitors, shelter, fuel, food and movement would have been pressing practical concerns. Wood was likely scarce in the open northern landscapes suggested by the plant evidence, while weather could shift sharply across generations or even much shorter spans. Such constraints help explain why the archaeological signal may be faint, but they cannot convert absence of evidence into evidence of a vanished settlement. The later Last Glacial Maximum would further erode, bury and rework older surfaces across much of Ireland, making survival of fragile campsites especially unlikely.

A Date Represented by Sediment

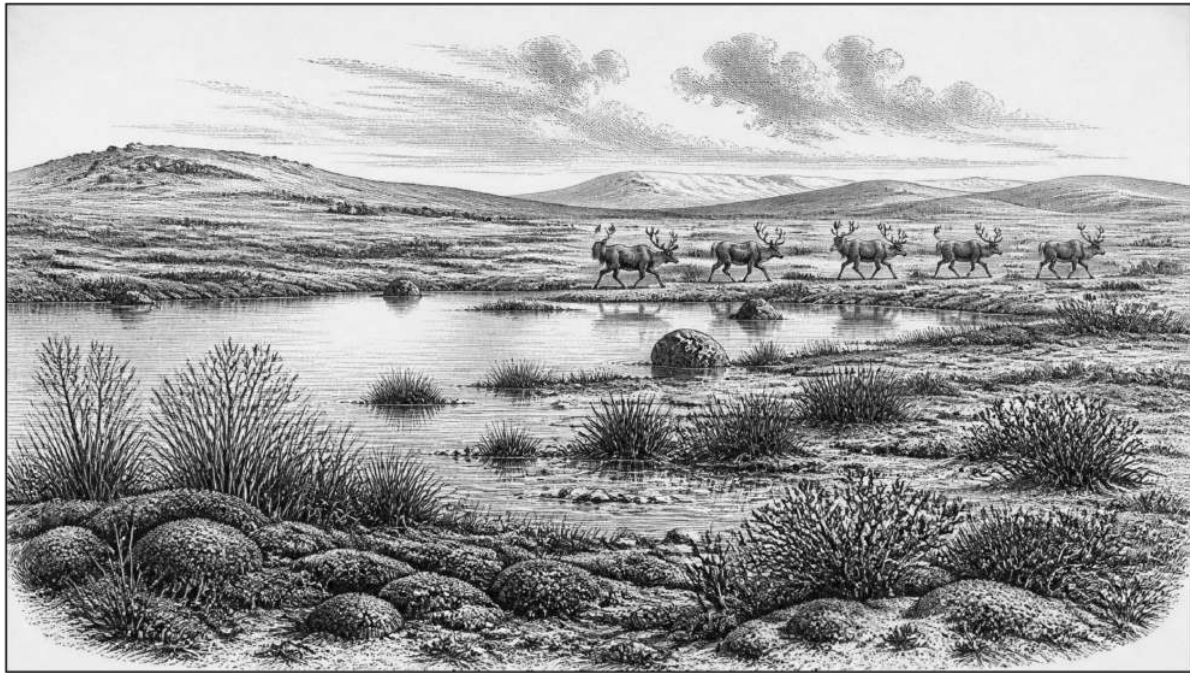
The principal historical development illuminated by 31,698 BCE is therefore environmental rather than political: Ireland contained ice-free landscapes during part of a climatically volatile Late Pleistocene interval, and those landscapes could include cold freshwater wetlands and a varied large-mammal fauna. Derrynree's moss-rich silts, protected beneath later till, are more valuable than a fabricated event would be. They show how Irish history at such depth is assembled—from pollen and seeds, insects and bones, cave calcite, sediment layers and calibrated probability ranges.

The evidence also sets firm limits. We cannot name the inhabitants of Ireland because none are known. We cannot assign a religion, a language, a trading network or a battle because none is attested. The dated record gives a landscape in motion: wetlands forming between glaciations, animals arriving and disappearing over millennia, and ice eventually advancing again. At this remote horizon, that is not a thin version of conventional history. It is the history that the surviving Irish ground can genuinely sustain.

Chapter 004 of 100

31697 BCE

Denekamp Over Doneraile^[4]



31,697 BCE is not a recoverable year in Irish history. It is a modern numerical label, roughly 33,646 years before AD 1950, or about 33.6 thousand calibrated years before present (cal BP). No Irish community left a calendar, ruler list, settlement sequence or historical memory that can be assigned to this single year. At this depth of time, radiocarbon results require calibration and are best understood as probability ranges, while sediments and cave deposits can accumulate across centuries or millennia. The responsible history of this moment is therefore an account of a broad Late Pleistocene interval, not a fabricated annual chronicle.

The date falls within Marine Isotope Stage 3 (MIS 3), a climatically unstable portion of the last Ice Age, and near the beginning of the continental north-west European interval often called the Denekamp Interstadial. That latter name should not be treated as a precise Irish season or a uniform warm phase. Ireland's surviving evidence is sparse, discontinuous and geographically uneven. It shows landscapes changing between cold open ground, freshwater basins, cave environments and advancing ice, rather than a single stable national climate.

An Island Without a Historical Polity

There was no Ireland in the political or cultural sense meant by later history. No evidence identifies chiefs, kingdoms, diplomacy, warfare, ethnic groups, religious institutions, languages, trade networks or named settlements at this date. Nor is there evidence for farming, domestic animals, pottery, metalworking, monuments or permanent villages. Those absences matter. They do not prove that every part of the island was empty at every instant, but they do mean that claims about political affairs, social hierarchy, ritual or everyday human life would exceed what the archaeology can responsibly sustain.

What can be described is a physical island at the Atlantic edge of Europe. Sea level was far lower globally than it is today, but Ireland was not simply joined to Britain by a dry land bridge. Its changing shorelines, sea passages, ice margins and surrounding shelf were shaped by the interacting effects of ice-sheet growth, sea level and crustal movement. Any people or large animals reaching Ireland had to negotiate that difficult, shifting geography.

Derryvree's Cold Freshwater World

The clearest Irish environmental comparison comes from Derryvree near Maguiresbridge, County Fermanagh. Road works there exposed organic-rich freshwater silts and fine sands between two layers of glacial till. The deposit yielded a radiocarbon determination of $30,500 \pm 1,170/1,030$ radiocarbon years BP. With modern calibration, that determination represents a wide calendar range rather than a date precise enough to identify 31,697 BCE itself. Yet it securely places the Derryvree environment within the broad later MIS 3 world relevant to this article.

Its plant and animal traces indicate a cold, treeless, periglacial landscape. Mosses, sedges, herb pollen, aquatic and wet-ground plants, and insects of northern affinities point to shallow freshwater, saturated ground and open vegetation. The word *tundra* is useful if used carefully: it describes an ecological character of low vegetation and severe conditions, not a neat modern biome transplanted unchanged into Ice-Age Fermanagh. Dry ground may have supported scattered herbs and dwarf shrubs, but woodland was not the governing feature of the scene.

Derryvree also teaches a larger lesson about regional change. Its freshwater deposits were later overridden or sealed by ice-related sediments. The record is thus evidence that this locality experienced an ice-free interval between glacial advances, not proof that all Ireland was simultaneously ice-free. Nearby Fermanagh sites at Hollymount and Greenagho preserve related inter-till organic deposits, reinforcing the conclusion that ice, water, vegetation and exposed ground repeatedly reorganised the northern landscape.

Calcite, Thaw and Climate Pulses

Crag Cave, near Castleisland in County Kerry, supplies a contrasting archive. Stalagmites and other speleothems grow only when water can percolate through soil and limestone and drip within the cave. Uranium-series dates show that calcite formation occurred episodically at Crag Cave during the last glacial period, with growth phases corresponding broadly to Greenland interstadials. Interruptions in growth record colder or drier conditions in which water movement and cave deposition were reduced or stopped.

This does not give Ireland a precise temperature for 31,697 BCE, nor does one cave stand for the whole island. It does, however, rule out a simplistic vision of an island permanently entombed beneath uniform ice at all times before the Last Glacial Maximum. Around the broader period represented by this date, local environments could change sharply over millennial and shorter scales. The prospective expansion of the British–Irish Ice Sheet was one of the decisive regional forces, ultimately eroding, burying and redistributing much of the older landscape evidence on which modern reconstruction depends.

Castlepook's Animal Archive

The most striking evidence from southern Ireland comes from Castlepook Cave, also known historically as Mammoth Cave, near Doneraile in north County Cork. Cave excavations, particularly those undertaken in the early twentieth century, recovered a remarkable assemblage including woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. Geological Survey Ireland describes Castlepook as the richest Irish site for studying the country's Ice-Age vertebrate fauna.

Those animals should not be imagined as one herd gathered outside the cave in the notional year under review. The collection was amassed across a substantial span of time, and many early excavations did not record strata to modern standards. Caves can collect bones through carnivore activity, natural deaths, water movement, collapse, later disturbance and human intervention. Newer radiocarbon pretreatment and redating have altered the chronology of several Irish cave specimens by thousands of years. In particular, reassessment of Castlepook, Foley and Shandon material indicates that giant deer and spotted hyaena may have disappeared locally before about 40,000 cal BP.

Even with that warning, Castlepook transforms the scale of the Irish story. Reindeer imply cold, open country with seasonal forage; woolly mammoth and giant deer point to productive patches of grasses, sedges and herbs; lemmings, hares and foxes belong to northern ecological conditions; and hyaenas indicate a predatory and scavenging community now entirely absent from Ireland. The cave is evidence for a succession of mobile animal populations, not for a domesticated landscape. The economy, if the word can be used at all, was ecological: energy moved through plants, herbivores, carnivores, scavengers and decomposition, rather than through farms, markets or trade.

The Reindeer Femur and Human Possibility

A reindeer femur from Castlepook has made this period especially important. It has been publicised as dating to around 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as a chop or cut made with a sharp stone implement during butchery. If that interpretation is accepted, it would indicate human activity in Ireland far earlier than the well-established Mesolithic settlement of the early Holocene. It would not demonstrate a town, a population of known size, a permanent camp or a continuous human occupation of the island.

Caution is essential because this is a single, consequential trace from a complicated old cave collection. A bone modification must be distinguished from carnivore scoring, sediment abrasion, trampling, weathering, excavation damage and later handling; its date must also belong securely to the marked specimen rather than merely to associated deposits. The wider archaeological record has yet to produce a securely stratified contemporary hearth, stone-tool assemblage, dwelling floor or cemetery in Ireland. The femur therefore supports a carefully framed possibility of brief Upper Palaeolithic visitation or carcass processing, not a confidently reconstructed Irish hunter community.

What Daily Life Cannot Yet Tell Us

Should people have reached Castlepook or another Irish locality around this broad period, their practical concerns would probably have involved shelter, warmth, movement, tool maintenance and access to animal food in a severe seasonal environment. That is an inference from Upper Palaeolithic lifeways elsewhere in north-west Europe, not direct evidence from Ireland. No Irish artefact assemblage

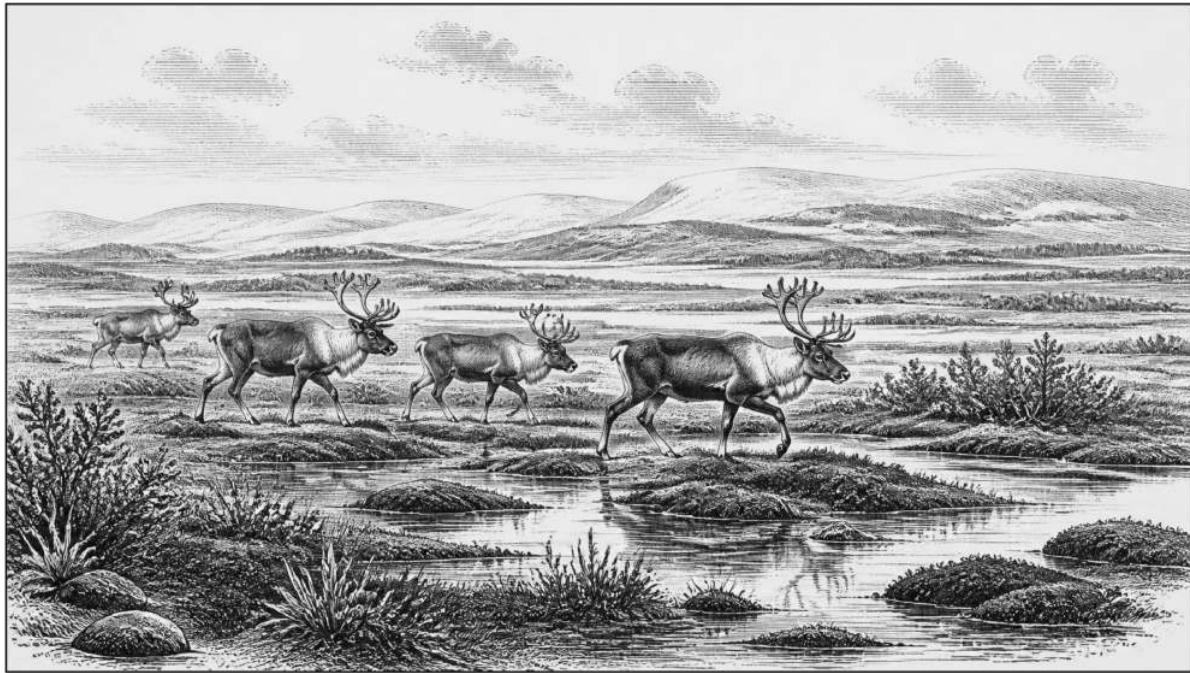
currently allows the reconstruction of clothing, kinship, language, artistic practice, ritual, learning or exchange at 31,697 BCE. The only defensible cultural emphasis is methodological: Ireland's apparent silence partly reflects genuine scarcity, but also the destructive power of later glaciers and the limitations of antiquarian recovery.

For that reason, the foremost development around this date was environmental rather than political. Ireland was a fluctuating Ice-Age terrain in which freshwater basins could sustain mosses and sedges, caves could preserve episodic evidence of a rich fauna, and ice-sheet expansion was beginning to reshape the archive itself. Derryvree, Crag Cave and Castlepook do not furnish a year-by-year narrative. Together, they offer something more durable: a disciplined picture of the changing conditions from which Ireland's much later human history eventually emerged.

Chapter 005 of 100

31696 BCE

Derryvree's Cold-Stage Wetland^[5]



Modern calendar-year precision is not available for Ireland in 31,696 BCE. This is a retrospective label, not a year that anyone then named, recorded or could have recognised. In the archaeological convention of calibrated years before present—where “present” means AD 1950—it lies approximately 33,645 years ago. That conversion is only a guide: radiocarbon determinations at this depth of time must be calibrated and expressed as probability ranges, not treated as anniversaries. The relevant setting is the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age.

No Irish chronicle, monument, settlement, cemetery or securely dated human camp identifies an event in this particular nominal year. The evidence is instead environmental: sediments lodged beneath later ice, microscopic pollen, plant remains, insects and animal bones. These archives allow a cautious account of conditions across broad spans of centuries or millennia. They cannot tell us who governed Ireland, whether anybody lived there continuously, or what occurred in one season around 31,696 BCE.

A Date Within a Range

The distinction between radiocarbon years and calendar years matters especially here. Atmospheric carbon-14 has not remained constant through time, so a laboratory radiocarbon result is not automatically a calendar age. The internationally maintained IntCal20 calibration curve extends to 55,000 calendar years before present, but uncertainty increases greatly in this older portion of the record. A date written as 31,696 BCE should therefore be read as a place in a very long sequence, not as a sharply defined historical moment.

Its closest useful Irish comparison comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed organic freshwater silts and fine sands enclosed between two layers of glacial till within a drumlin. The sequence produced a conventional radiocarbon age of 30,500 BP, with a large stated uncertainty. Later calibration places its possible age broadly at about 36,900–31,700 cal BP. The nominal date considered here falls within that broad range, but it does not date any individual plant, animal, journey or human action at Derryvree.

The order of deposits is nonetheless highly informative. An earlier glacier laid down the lower till. During an interval when the immediate locality was ice-free, freshwater and organic sediment accumulated. A later ice advance covered and preserved the deposit beneath the upper till. This is firm evidence of changing glacial conditions in south Fermanagh. It is not a map of the whole island at one instant: ice margins, local drainage, elevation and exposure could all have made Ireland environmentally varied.

Wet Ground on an Open Plain

Derryvree offers the clearest picture of an Irish landscape plausibly relevant to this horizon. Its pollen, plant macrofossils, mosses and insect remains point to a cold, open and predominantly treeless environment. Grasses, sedges, herbs, low shrubs and mosses occupied ground where they could survive short summers, hard winters and frost-disturbed soils. The record includes bogbean, a plant associated with wet ground, while the wider assemblage has been interpreted as tundra or muskeg-like terrain: saturated mossy patches, sedgy margins and shallow freshwater pools amid more exposed ground.

This was not uniformly barren country. A wetland capable of preserving plant matter and supporting insects was biologically productive at a small scale. Yet it was not the later wooded Ireland familiar from Holocene pollen records, nor a landscape of permanent fields. Trees, if present at all locally, were scarce. The most defensible reconstruction is a patchwork of cold-steppe and tundra-like vegetation, fresh water and frost-affected soil, shaped by a severe continental climate and by proximity to expanding or fluctuating ice.

MIS 3 was not one unchanging freeze. Greenland ice-core records and wider North Atlantic evidence show repeated, abrupt climatic oscillations on millennial scales. Those shifts did not translate simply into an Irish thermometer reading, but they caution against imagining one stable “Ice Age climate”. The Derryvree deposit records conditions over a span of accumulation; it cannot establish the exact temperature, snowfall, coastline or extent of vegetation in 31,696 BCE itself.

Animals and a Connected World

In southern Ireland, the limestone caves at Castlepook near Doneraile, County Cork preserve the island’s richest known assemblage of pre-Last Glacial Maximum vertebrate remains. The cave archive includes animals associated with a cold, open world: reindeer, woolly mammoth, giant deer, mountain hare, Arctic lemming, foxes, wolves, brown bear and spotted hyaena. Not every species need have occupied Cork at the same time. Cave deposits can accumulate through repeated use by carnivores, through animals falling or sheltering inside, and through water and sediment moving bones between layers.

Modern direct radiocarbon dating has revised parts of this collection. A 2020 reassessment concluded that some southern Irish fauna was substantially older than earlier measurements had indicated, placing important material in MIS 3 and suggesting that giant deer and spotted hyaena may have disappeared

locally before the Last Glacial Maximum. The central point for this date is secure: Ireland was not ecologically isolated from north-western Europe throughout the earlier last glacial cycle. Cold-adapted mammals reached parts of the island during phases when routes and habitats permitted.

How they arrived remains less certain. Sea level was lower than today, remodelling the Irish Sea basin and exposing larger coastal plains. But lowered sea level alone does not prove a simple, continuous land bridge from Ireland to Britain or the continent; the route depended on local bathymetry, ice, water and the timing of sea-level change. Animal movement may have followed temporary terrestrial corridors, coastal lowlands or ice-margin landscapes. The fossils demonstrate connectivity in ecological terms, not the exact path taken by a particular herd.

The Castlepook Human Question

One Castlepook object gives this period unusual archaeological importance: a reindeer femur, recovered from an older cave collection, has been directly dated to roughly 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone implement on fresh bone. If that interpretation is confirmed, it may be evidence that Upper Palaeolithic people butchered reindeer in Ireland during MIS 3—many millennia before the well-established post-glacial settlement record.

The qualification is essential. The bone was not recovered in a modern excavation from an intact living floor beside a hearth and stone tools. Its radiocarbon date dates the animal's death, not automatically the moment of cutting; the identification of a single groove as a humanly made cut is a separate specialist judgement. No securely associated lithic assemblage, hearth, dwelling, burial, food-processing area or repeated occupation surface of comparable antiquity has yet been demonstrated at Castlepook. Ongoing work in the cave seeks stratified deposits that could test the proposition more decisively.

Accordingly, a brief human visit is possible, and the femur may preserve an exceptionally early trace of butchery. A resident population, a named hunting group or a settled Palaeolithic society cannot responsibly be inferred. The cave itself may have been used far more often by carnivores than by people. Absence of proven camps should not be transformed into certainty that no person ever reached Ireland, but neither does one contested bone establish continuous occupation.

What Cannot Yet Be Written

There is no evidence for political affairs, diplomacy or organised warfare in Ireland at this horizon. Nor can archaeology identify social rank, household size, kinship rules, language, music, ritual or formal religion. People elsewhere in Upper Palaeolithic Europe made sophisticated tools, art and social networks, but it would be unsound to import those achievements wholesale into Ireland without an Irish assemblage securely demonstrating them. The same restraint applies to economy and trade: hunting or scavenging of large mammals is conceivable if the Castlepook mark is anthropogenic, but there is no evidence for Irish exchange networks, farming, herding, metalworking or permanent settlement.

What can be said is both narrower and striking. Around the broad interval represented by 31,696 BCE, portions of Ireland supported life between episodes of glaciation. In Fermanagh, freshwater lay among open, frost-prone wetlands; in Cork, cave deposits record a changing cold-stage fauna. This was a

regional frontier of the north-west European Ice Age, vulnerable to abrupt climatic change and to the later expansion of the British–Irish Ice Sheet. Its history survives not in kings or battles, but in a buried wetland, scattered bones and the difficult questions they still pose.

Approaching Greater Ice Cover

The date also sits well before the maximum extent of the last British–Irish Ice Sheet, which research places broadly around 27,000–23,000 years ago, with differing measures of maximum area and volume. Later ice would reshape much of Ireland, eroding older land surfaces, transporting sediment and obscuring the archaeological record. That destructive history helps explain why evidence for the deep Palaeolithic is so sparse. Derryvree is valuable precisely because later till sealed its fragile organic sediments rather than removing them altogether.

For this reason, the most important development is environmental rather than political: Ireland was a changing cold-stage landscape, not simply an island sealed beneath permanent ice. The Derryvree record establishes an ice-free interval with functioning wetland ecology; Castlepook shows that large mammals entered the island's wider Ice Age world; and the marked reindeer femur raises, without resolving, the possibility of human presence. At 31,696 BCE, calibrated ranges and material evidence are the proper historical scale.

Chapter 006 of 100

31695 BCE

North Cork Reindeer Limb^[6]



31,695 BCE is not a date at which Irish prehistory can be narrated year by year. It is a modern calendar label, equivalent to roughly 33,645 years before the conventional radiocarbon reference year of AD 1950, and neither people nor events in Ireland at this depth of time can be fixed to a particular calendar year. The responsible frame is therefore a calibrated range and an archaeological period: later Marine Isotope Stage 3 (MIS 3), before the Last Glacial Maximum. For the island, the evidence is exceptionally fragmentary, but it is not entirely silent. Organic deposits beneath later glacial sediments and animal remains from limestone caves illuminate a cold, changing landscape in which a fleeting human visit is possible, rather than a documented settled population.

A Landscape Before Full Glaciation

At this point in the last Ice Age, Ireland was moving towards, but had not yet reached, the maximum expansion of the British-Irish Ice Sheet. The Last Glacial Maximum is generally placed at about 26,500–19,000 calibrated years BP, much later than the date considered here. Evidence for the earlier build-up of ice is complex and remains debated from region to region. Yet dated deposits beneath till show that substantial areas of Ireland had remained ice-free during parts of MIS 3. The important point is not that every valley was open at the same time, but that the familiar picture of an island wholly buried beneath ice does not fit this earlier interval.

In County Fermanagh, organic-rich silts at Derryvree, near Maguiresbridge, lay between two tills: sediments left by separate advances of glacier ice. A radiocarbon determination from the organic material has been calibrated broadly to about 36,900–31,700 years BP. That span includes the broad chronological neighbourhood of 31,695 BCE. Another sub-till freshwater deposit at Greenagho has produced a

calibrated range of roughly 37,200–35,700 BP. These are not occupation sites, and they do not provide a weather report for a single year. They do, however, securely show that freshwater and terrestrial environments existed in parts of northern Ireland before renewed ice covered the deposits.

The plants and insects recovered from such buried sediments suggest an exposed periglacial country. At Derryvree, the evidence has been interpreted as a treeless muskeg or wetland landscape, with sedges, mosses and plants able to endure short growing seasons, frozen ground and difficult drainage. This was not a uniform white wilderness. Pools, wet hollows, mineral ground, stream margins and drier patches would have created different habitats within a generally cold setting. Wind, seasonal snow, frost action and low vegetation cover shaped the ground. The woodlands, enclosed fields and peat bogs of later Ireland belonged to a very distant future.

The Cave Record of North Cork

Southern Ireland offers another, very different archive. Castlepook Cave near Doneraile, County Cork, was excavated in the early twentieth century, when methods of recording cave deposits were far less exacting than they are today. Its old collections, held by the National Museum of Ireland, nevertheless preserve bones of animals that lived in Ireland before the Last Glacial Maximum. Reindeer, giant deer, mammoth, brown bear, wolf and spotted hyaena are among the species represented in the wider Castlepook assemblage. Together they indicate a landscape capable of sustaining large grazing animals and their predators during colder phases of the Late Pleistocene.

The assemblage must be handled carefully. Caves are not straightforward snapshots of an outdoor animal community. Carnivores can drag carcass parts into them; water and sediment can move bones; bones from separate periods may become mixed; and antiquarian excavations rarely retained the precise stratigraphic information now expected. Recent redating has also shown that some older Irish cave radiocarbon measurements required revision, in certain cases producing markedly older ages. Castlepook is thus valuable precisely because it preserves a long and complicated record, but it cannot establish that every species lived together, or was present in the same valley, at one moment around 31,695 BCE.

Reindeer are particularly important for understanding the broad environment. Their presence is consistent with open, cold habitats and seasonal movement across a wider north-west European zone. Mammoth and giant deer reinforce the picture of a fauna unlike that of modern Ireland, while hyaena and wolf reveal functioning predator–scavenger relationships. These animals were not symbols of an imagined “Celtic” past, nor evidence of later Irish traditions. They belonged to a Pleistocene ecological world that would be profoundly disrupted by advancing ice, changing sea levels and the repeated reorganisation of habitats.

The Marked Femur

One object from Castlepook has attracted particular attention: a reindeer femur bearing a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made by a sharp stone edge during carcass processing. County Cork heritage material has presented the bone as dating to around 31,000 BCE. If the mark is correctly identified as a stone-tool cut, it is potentially the earliest evidence for human activity in Ireland by a very large margin. It would suggest that at least one person handled a reindeer carcass in the broader period represented by the bone. It does not, by itself, identify the people, their language, their numbers, their sex, their route of arrival or the duration of their stay.

The distinction between the observation and its interpretation matters. The observed facts are a reindeer limb bone, its radiocarbon age as reported for the specimen, and an incision on its surface. The interpretation is that the incision is a deliberate cutmark, rather than damage made by a carnivore, excavation tool, sediment movement or another process. Specialists assess such questions through the mark's form, position and microscopic characteristics, but the old excavation context limits what can be concluded. There are no securely associated stone tools, hearths, dwelling floors, human remains, ornaments, burials or art from Ireland of this age. The bone therefore supports, at most, a possible brief Upper Palaeolithic human incursion, not a demonstrated settlement.

Nor can the femur tell us whether a hunter killed the reindeer, scavenged a dead animal, stripped hide, removed meat, separated a joint or sought sinew or marrow. The bone may have reached the cave only after carnivores moved discarded remains from an outdoor processing place. That possibility is not a weakness to be hidden; it is part of the historical value of the find. It makes visible the chain of decisions and natural processes that must be reconstructed before a cave bone becomes evidence for human action. Renewed investigation at Castlepook has sought surviving undisturbed deposits that may eventually test the older collection against a modern excavation record.

People Without a Recorded Society

If humans were present, their social world remains beyond direct recovery. There is no evidence for chiefs, territories, political institutions, alliances, warfare, diplomacy or inherited authority in Ireland at this date. There is likewise no basis for reconstructing religion, named beliefs, teaching, language, artistic convention or ceremonial practice. Such absences are not trivial gaps in a familiar national story: they are the central condition of the evidence. The earliest potential human trace is a single modified animal bone, not a settlement archive. To attach later cultural identities to it would be anachronistic.

Some inferences are reasonable at a very general level. A person capable of making the Castlepook incision, if the interpretation is accepted, possessed a sharp lithic tool and knowledge of animal anatomy sufficient to process a carcass. In the wider European Upper Palaeolithic, small mobile groups used stone technologies, moved across large seasonal landscapes and drew food, hide, bone and sinew from animals. That continental context helps explain what a cutmark might mean, but it must not be mistaken for proof that the same practices occurred in Ireland. Irish evidence has not yielded the implements or camp deposits needed to demonstrate them locally.

Economy and trade are similarly unresolvable. There is no evidence for farming, livestock keeping, cereal cultivation, pottery production, metalworking or exchange networks in Ireland around this time. Any food-getting by visiting people would have depended on wild resources: most visibly large herbivores, but potentially smaller animals, birds, fish and gathered plants where season and locality allowed. “Trade” is too strong a word for the available record. Movement, however, is inherent in the problem. Ireland's coasts and surrounding shelf were configured differently under lower global sea levels, but the precise routes, crossings and degrees of connection with Britain and continental Europe are uncertain. A lower sea level does not automatically prove a walkable land bridge.

What This Date Can Mean

The strongest historical development around 31,695 BCE is environmental rather than political. Ireland contained, or lay close to, cold but biologically active landscapes during MIS 3. Fermanagh's buried freshwater deposits preserve plants and insects from one such setting; Cork caves preserve the

bones of animals adapted to an open Pleistocene world; and Castlepook's marked reindeer femur raises the possibility that people entered that world as well. These lines of evidence do not form a continuous story. They are geographically separated, differ in date and preservation, and each has its own uncertainties.

Within several millennia, ice expansion would transform the island, erase many exposed traces and help explain why the Irish Palaeolithic record is so sparse. Glacial erosion, later marine change and the loss of lowland landscapes have all reduced the chance that short-lived camps survived. The appropriate image for 31,695 BCE is consequently not a populated prehistoric Ireland with known customs, but a cold, open and dynamic land: wetland basins in the north, large mammals in the south, approaching ice, and one reindeer bone that may preserve the faintest sign of a human hand.

Chapter 007 of 100

31694 BCE

Castlepook's Incised Femur^[7]



A Date Outside Calendar History

“31,694 BCE” is a useful modern filing point, not a date at which an event can be assigned to Ireland. No written record, named individual, settlement sequence or archaeological layer can resolve a particular Irish year so far back. In scientific terms the point falls at roughly 33,600 calibrated years before present (cal BP, where “present” is AD 1950), within Marine Isotope Stage 3, a long and climatically unstable portion of the last glacial cycle. At this depth of time, radiocarbon dates come with substantial ranges and are periodically revised as laboratory methods and calibration curves improve. Modern IntCal20 calibration extends to 55,000 cal BP, but it does not turn a bone, pollen sample or silt bed into a diary entry.

The most responsible account of Ireland at this point is therefore regional and evidential. It concerns a cold, changing north-western edge of Europe; the plants, animals, water and ice that left durable traces; and one exceptional north Cork bone which may preserve evidence of people. It cannot responsibly supply a king, tribe, battle, diplomatic encounter, religion or a permanent community. Those categories belong to much later historical societies, not to the sparse and disturbed evidence available for Ice Age Ireland.

An Uneven Glacial Island

Ireland was not yet at the climatic climax usually called the Last Glacial Maximum. The maximum spread of the British–Irish Ice Sheet was asynchronous from region to region, with its greatest overall extent around 26,000 years ago; research on the western and southern Irish sectors places major ice

expansion after the period considered here. This does not mean a mild or uniformly ice-free island. It means that ice margins, frozen ground, exposed terrain, drainage and coastal geography were changing at different rates in different places. The familiar modern outline of Ireland was not an adequate guide to the available land or routes of movement.

Crag Cave in County Kerry offers an important independent indication of this instability. Calcite formations in a shallow cave can grow only when liquid water percolates through soil and rock, conditions incompatible with permanent deep freezing at the site. Uranium-thorium dates show episodic speleothem growth in south-west Ireland through much of the last glacial period, with particularly active deposition in the later part of MIS 3. That is evidence for intervals of amelioration, not for a warm Ireland or for a stable climate. The same study identifies swings of at least 10°C between colder and milder phases.

For people and animals, such variation mattered more than any notional annual date. A short-lived improvement could alter snow cover, plant growth, freshwater availability and the practical permeability of a landscape. A return to severe cold could reverse those advantages. Ireland was a western frontier within a wider European world of shifting ice, sea and open ground.

Derryvree's Wet Tundra

The clearest Irish environmental archive close to this horizon lies at Derryvree near Maguiresbridge, County Fermanagh. Road works exposed freshwater silts and fine sands caught between two tills: sediment left by an earlier glacial episode lay beneath them, while later ice-related deposits sealed them above. This order of layers is firm evidence for a non-glacial freshwater interval between episodes of glaciation. It is not evidence that every district in Ireland was simultaneously open, nor that the later drumlin landscape had already taken its modern form.

The organic material from Derryvree produced a conventional radiocarbon result of about 30,500 ± 1,170 radiocarbon years BP. Published calibrated discussion places the deposit broadly around 36,900–31,700 cal BP. The modern calendar label 31,694 BCE lies within that broad span, but cannot be located more precisely inside it. Derryvree consequently illuminates the kind of landscape that could exist around this point, not the weather or biological activity of an exact year.

Pollen, plant macrofossils, mosses and insects from the deposits indicate a cold, largely treeless setting. Sedges, grasses, herbs, dwarf shrubs, mossy wet ground and open water formed a periglacial mosaic sometimes compared with muskeg: saturated ground punctuated by shallow pools and subject to frost. This was neither a barren sheet of snow nor the later wooded island of oak, elm, hazel and ash. Short growing seasons constrained vegetation, yet freshwater margins could support a varied, productive local ecology. Nearby Greenagho provides a further Fermanagh inter-till record, reinforcing the conclusion that parts of the region experienced cold but biologically active intervals before later ice advance.

The Animals of Castlepook

Nearly 300 kilometres south-west of Derryvree, Castlepook Cave near Doneraile in County Cork preserves Ireland's richest known assemblage of vertebrate remains from the period leading towards the Last Glacial Maximum. Its narrow limestone passages and chambers accumulated bones over a long interval rather than during one event. The cave's fossil record includes woolly mammoth, reindeer, giant

deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Such a list is evidence that these animals reached Ireland at different points in the Ice Age; it must not be read as a single, perfectly contemporary herd-and-predator scene.

Recent redating has made that caution especially necessary. Improved treatment and accelerator radiocarbon methods showed that several bones from Castlepook were significantly older than earlier determinations suggested. The revised work indicates that some animals, including giant deer and spotted hyaena, may have disappeared locally before roughly 40,000 cal BP. Castlepook remains indispensable, but it is a cave archive assembled through carnivore activity, natural deaths, transport, sediment movement and early excavation, rather than an intact open-air habitat sampled in a single season.

Even with those limits, the fauna conveys the scale of the Irish environment. Reindeer point to open, cold terrain and seasonal mobility; hares, foxes and lemmings to northern or alpine-style conditions; mammoth and giant deer to a landscape with enough forage and accessible ground for large herbivores. Spotted hyaenas and wolves indicate carnivores capable of scavenging, hunting and carrying remains into shelter. A cave may thus represent a den, trap, refuge or bone-collecting place, not simply the spot where an animal died. The animal evidence supports an ecologically connected Irish landscape, but not a simple reconstruction of population sizes or migration routes.

The Reindeer Bone Question

One Castlepook specimen matters particularly for the human story: a fragment of reindeer femur carrying a deep incision interpreted by zooarchaeologist Ruth Carden as a mark made with a sharp stone tool during butchery. County Cork heritage material identifies the object as a Palaeolithic reindeer femur from Castlepook, conventionally presented as c. 31,000 BC. If the modification is anthropogenic, it is potentially the earliest known sign of people in Ireland by a very large margin.

Its importance must be matched by restraint. The specimen comes from an old cave collection, not a modern excavation of an undisturbed hearth, floor or hunting stand. No securely associated stone-tool assemblage, dwelling, fire-place, human burial or repeated occupation surface of comparable age has been recovered. A radiocarbon result dates the animal's death, rather than automatically dating a cut, identifying the place of butchery, or measuring how long people remained nearby. The cave's carnivores may have transported discarded or scavenged portions of carcasses into the galleries. Current Castlepook research has explicitly sought intact deposits and direct evidence such as lithics, charcoal and further modified bone because the question is not yet settled by a single marked specimen.

The strongest conclusion is therefore modest but momentous: people may have reached Ireland during MIS 3 and may have processed reindeer in the wider Castlepook landscape. The femur does not demonstrate an enduring settlement, a distinct Irish population or continuous occupation before the ensuing expansion of ice. Nor can it tell us whether visitors came once, seasonally, or over generations.

Life Beyond the Evidence

If people were present, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in north-west Europe. Reindeer could provide meat, fat, hide, sinew, antler and bone; stone tools would have been crucial to cutting and working animal materials. Yet those statements are comparative interpretation, not direct observations of a Castlepook camp. No food store, shelter, grave, art panel, ornament, hearth or tool-making floor securely dated to this Irish horizon permits a fuller reconstruction of everyday life.

Accordingly, there is no evidence for political authority, territorial states, formal diplomacy, warfare or trade in Ireland at 31,694 BCE. There is likewise no direct evidence for religious practice or institutional learning. People, if present, certainly possessed knowledge: of animal movement, weather, materials and survival in dangerous terrain. But archaeology cannot identify their language, beliefs, kinship system or ceremonies from the present record. Absence of evidence is not proof that these things did not exist; it is a boundary on what can be claimed about Ireland.

The principal development represented by this nominal year is environmental possibility. Derrynvree shows that cold-stage Ireland included freshwater wetlands and tundra vegetation between glacial advances. Crag Cave records episodic conditions mild enough for liquid water to circulate underground. Castlepook proves that substantial Ice Age mammals entered the island's wider region, while its incised reindeer femur holds out the serious, unresolved prospect of human butchery. In place of a conventional annual chronicle, 31,694 BCE offers a rare view of Ireland as an unstable Pleistocene frontier: living, changing and only partially knowable.

Chapter 008 of 100

31693 BCE

Derryvree's Arctic Mosses^[8]



31,693 BCE is a modern numerical label, not a date that can be isolated in Ireland's archaeological record. No Irish calendar, writing, named community or event survives from this depth of time. In terms used by Quaternary scientists, it falls about 33,642 calendar years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the last Ice Age. The responsible history of this point is therefore a history of deposits, radiocarbon measurements and broad environmental ranges—not a narrative of a single year.

The most revealing Irish evidence belongs to spans that may overlap this nominal year. A freshwater sequence at Derryvree, near Maguiresbridge in County Fermanagh, produced a radiocarbon age of 30,500 +1,170/–1,030 radiocarbon years BP. With modern calibration, that determination covers a broad range extending from roughly the late thirty-seventh into the early thirty-second millennium calibrated BP. It cannot date a particular season, generation or event. Yet it offers an unusually direct window onto an ice-age landscape in Ireland which existed between advances of glacier ice.

A Date Between Ice Advances

At Derryvree, roadworks in 1969 cut through a drumlin and exposed a remarkable sequence: glacial till below, freshwater silts and fine sands with organic material in the middle, and a further body of till above. The order matters. Ice had occupied the locality before the freshwater sediments accumulated; later ice crossed it again and sealed the deposit beneath the drumlin. The site is thus powerful evidence for environmental change, but it does not provide a map of the whole island at 31,693 BCE.

That caution is especially important because Irish ice-sheet history was uneven. The British–Irish Ice Sheet was a changing complex of ice centres, fast-flowing outlets and marine margins, not a single static white cover. Large-scale reconstructions indicate that substantial ice was developing across the wider

region by about 31,000 years BP and that maximum ice extent across Ireland and its continental shelf came later, broadly between about 27,000 and 23,000 calibrated BP. At the date considered here, local ice may already have occupied uplands and some northern sectors, while other ground supported freshwater habitats. The exact limits, thickness and timing remain matters of reconstruction rather than established facts for one calendar year.

Freshwater on a Treeless Plain

Derryvree's organic sediments contain pollen, seeds, mosses and insect remains. Taken together, they indicate an open tundra or muskeg-like environment: wet ground rich in mosses and sedges, shallow pools, exposed mineral surfaces and sparse dry-land vegetation. This was not a landscape of oak woods, enclosed pasture or peat bogs familiar from much later Ireland. It was a periglacial world shaped by long cold seasons, frost action and a short productive summer.

Macrofossils provide some of the clearest clues. They include bogbean, *Menyanthes trifoliata*, and mountain avens, *Dryas octopetala*, plants now associated in Ireland with wet places and Arctic-alpine conditions respectively. Mosses were exceptionally well represented. Pollen was chiefly herbaceous, including grasses and sedges, while any tree pollen is too scarce and potentially transported to demonstrate local woodland. The most defensible conclusion is not that every part of Ireland was identical, but that the Derryvree district contained cold, largely treeless ground bordering freshwater during the interval represented by the deposit.

Insects sharpen that picture. They point to waterlogged, plant-rich pools and mossy margins rather than a uniformly dry polar desert. Such places could be biologically productive during the brief growing season. Nevertheless, the environment was harsh. Frost, seasonal snow, low temperatures and limited woody vegetation restricted shelter and fuel. The freshwater beds preserve a living ecosystem, but one vulnerable to the renewed advance of ice that eventually buried it.

Animals and the Cave Record

County Cork's Castlepook Cave, near Doneraile, supplies a different kind of evidence. Its old excavations recovered a large, mixed assemblage of animal bones from cave passages. Modern redating has shown that some specimens are substantially older than earlier radiocarbon results suggested, placing parts of the fauna in MIS 3. The cave record includes species such as reindeer, brown bear, Arctic fox, hare, lemming, wolf, spotted hyaena, giant deer and woolly mammoth. These animals should not be treated as a census of Ireland in 31,693 BCE: bones can be separated in age by thousands of years, cave deposits may have been reworked, and many finds lack the detailed stratigraphic context expected of modern excavation.

Even so, the assemblage demonstrates that Ireland was at times ecologically connected to the north-west European ice-age world. Reindeer and lemming fit open cold-country habitats. Mammoth, giant deer and hyaena indicate that, during particular pre-Last Glacial Maximum phases, larger grazing and scavenging food webs existed somewhere within reach of southern Irish caves. Re-dating suggests that spotted hyaena and giant deer may have disappeared locally before about 40,000 calibrated BP, so neither should automatically be placed in the Derryvree interval. The stronger claim is that Late Pleistocene Ireland had supported a richer and less familiar fauna than its later, post-glacial landscape.

Caves were not necessarily animal homes in the human sense. They could act as traps, dens, scavenging sites, temporary shelters and sediment basins. Bone accumulation may result from carnivores, water movement, collapse or nineteenth- and early twentieth-century collecting practices as well as from human activity. Castlepook is invaluable precisely because it preserves traces usually erased from open landscapes by later glaciation; it is also difficult evidence which requires taphonomic care.

The Human Question

The most consequential, and most uncertain, issue is a reindeer femur from Castlepook reported as bearing a cut or chopping mark consistent with a sharp stone tool. The bone has been presented as possible evidence that people butchered reindeer in Ireland around 33,000 years ago. If that interpretation is sustained, it would extend the island's human story far beyond the formerly accepted terminal-Pleistocene evidence. It would imply a brief Upper Palaeolithic incursion, probably by highly mobile hunter-gatherers rather than a permanent and populous settlement.

But possibility is not proof of an inhabited island. The marked bone comes from older excavations, without a securely excavated living floor, hearth, stone-tool assemblage, dwelling or repeated occupation sequence attached to it. Natural damage, carnivore modification and post-depositional wear can sometimes resemble human marks, while a date on the animal establishes when it died, not automatically when a person handled it. Consequently, no responsible account can name a group, describe a hunt or claim a settlement for 31,693 BCE. The evidence supports an important research question, not an annual historical event.

There can be no discussion of Irish political affairs, diplomacy, formal warfare, religion, literacy or institutions at this date because none is evidenced. Nor is there evidence for farming, fixed villages, pottery, metalworking, long-distance trade or monumental construction. Should humans have reached Ireland during this phase, their economy would have depended on hunting, gathering and movement through a severe seasonal landscape. That is a comparative inference from Upper Palaeolithic lifeways elsewhere in north-west Europe, not a directly demonstrated Irish social system.

Coasts, Routes and Lost Ground

Modern Ireland was not the map experienced by Ice Age animals or any visiting people. Global sea level was lower than today, but the surrounding palaeogeography was complicated by local ice loading, changing coastlines and the deep basins of the Irish Sea. It is unsafe to imagine a simple, continuous land bridge from Ireland to continental Europe. Some exposed shelf ground and narrower sea crossings may have altered routes at different times, yet the availability of a route does not demonstrate that it was used.

Much potential evidence has also vanished. Advancing ice eroded older soils and surface camps; later meltwater, rising seas and coastal processes removed or submerged landscapes. The survival of Derryvree's buried wetland and Castlepook's cave bones is therefore exceptional. Their fragmentary nature should not be mistaken for insignificance. They record the ecological setting from which Ireland's later human history ultimately emerged: a cold, mobile and frequently disrupted world, in which water, vegetation, animals and ice were the principal historical forces.

What Can Be Said Responsibly

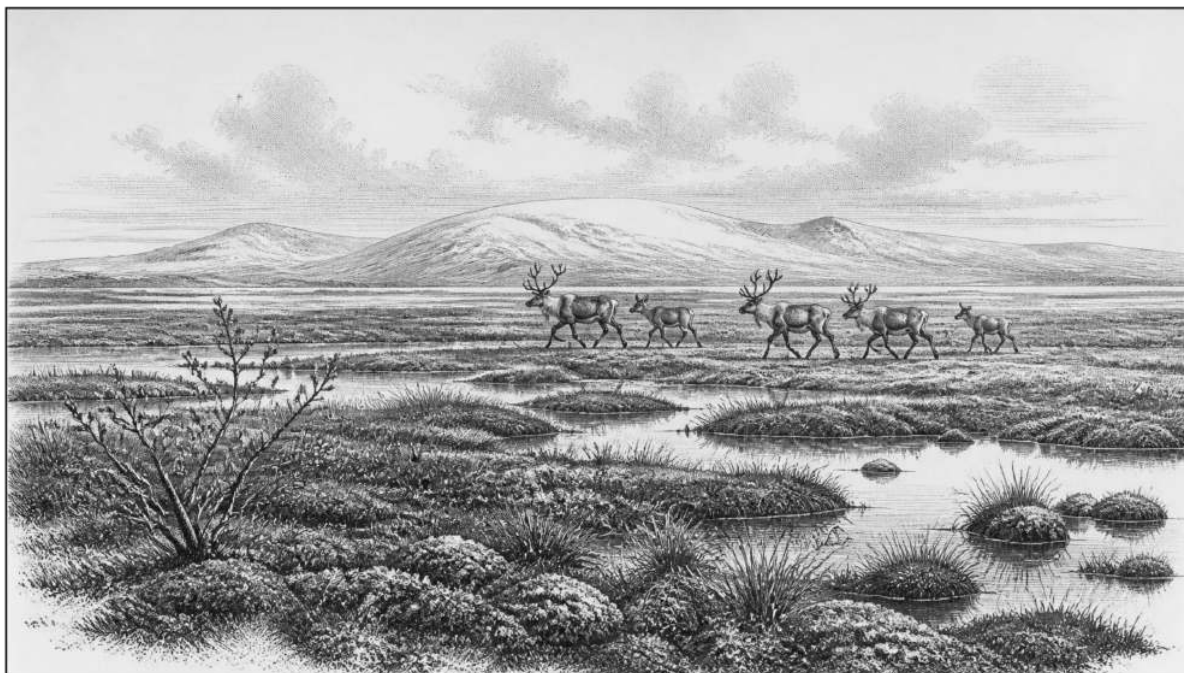
Around the broad interval denoted by 31,693 BCE, Ireland lay within a volatile late-Ice-Age environment before the full island-wide maximum of the last glaciation. At Derryvree, freshwater, sedges, Arctic-alpine plants and mosses occupied open periglacial ground during an ice-free interval. In southern caves, an assemblage of cold-stage and large mammal remains attests to ecological links beyond the modern island. Ice was advancing on a regional scale and would eventually transform or destroy many of these habitats.

That is already a major development in Irish history. It replaces the false image of a timeless, empty, uniformly frozen island with a better evidenced picture: Ireland contained changing ecological refuges and corridors, though their extent shifted dramatically. Whether people briefly entered that world remains unresolved. The archaeological task is not to fill the silence with invented clans or episodes, but to preserve the distinction between what the sediments and bones show, what they plausibly suggest, and what remains unknown.

Chapter 009 of 100

31692 BCE

Derryvree's Trifoliate Seed ^[9]



The modern label “31,692 BCE” cannot identify an event in Ireland in the way that it can for a medieval battle or a parliamentary vote. No calendar, writing system or dated human record existed on the island. In archaeological terms, it is best treated as a point within a much wider span: approximately 33,641 calendar years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a fluctuating cold interval of the Late Pleistocene. Precision at the level of a single year is unavailable. Radiocarbon determinations must be calibrated, and their results are probability ranges rather than exact anniversaries.

The closest Irish evidence comes from a freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Organic silts and sands there lay between two tills: sediments left by separate advances of glacial ice. A conventional radiocarbon determination of 30,500 years BP, with a substantial error range, has been calibrated broadly to c.36,900–31,700 cal BP. The nominal year considered here falls within that wide interval. It cannot be assigned to a particular layer, season, generation or individual animal, but Derryvree offers a responsible window onto parts of Ireland at roughly this depth of time.

Ice, Water and Uncertain Chronology

Ireland was in an Ice Age, but it was not simply a white, unchanging land buried beneath ice. The British–Irish Ice Sheet repeatedly altered its shape, size and flow during the last glacial cycle. At Derryvree, the lower till records an earlier episode when ice affected the locality. The organic-rich freshwater beds above it demonstrate that, for a time, the site was not beneath actively moving ice. An upper till subsequently sealed the deposit, preserving an interval of cold, ice-free or ice-marginal ground between glacial episodes.

That sequence matters because it corrects two tempting but misleading simplifications. First, the whole island cannot be assumed to have been continuously ice-covered at this time. Secondly, an ice-free patch in Fermanagh cannot be made to stand for every Irish region. Conditions differed between uplands, lowlands, coasts and the changing margins of ice. The Derryvree deposit is local evidence, while wider reconstructions of the Irish Ice Sheet remain necessarily regional and provisional. The maximum expansion of the last ice sheet belongs later, mainly after c.29,000 cal BP, with different sectors reaching their greatest extent at different times.

For this reason, older Irish regional terms such as the Midlandian and the Derryvree Cold Phase remain useful descriptions of sediment sequences, but should not be mistaken for globally synchronous weather events. The evidence supports a cold landscape with freshwater habitats and periglacial processes; it does not provide a nationwide forecast for 31,692 BCE. Climate in MIS 3 was capable of sharp shifts over periods far longer than a human lifetime but far shorter than geological eras.

A Treeless Freshwater Landscape

Derryvree's organic beds preserve more than mud. Pollen, plant macrofossils and insect remains point to a cold northern environment. Mosses and sedges grew in wet ground; the record includes species associated with shallow freshwater and marshy margins. Fossil evidence for bogbean, water-milfoil, mountain avens and dwarf willow is especially revealing. Together these plants indicate a mosaic rather than a featureless wasteland: pools and wet hollows, saturated moss-and-sedge ground, low herbaceous vegetation and scattered dwarf shrubs.

“Muskeg”, often used for this sort of waterlogged terrain, conveys the character of the place better than either forest or desert. It was a wet, uneven country in which organic matter accumulated slowly in cold waterlogged conditions. Trees did not form woodland at Derryvree. The absence of forest is important for how the landscape looked and functioned: wind could sweep across exposed ground, winter conditions could be severe, and plant cover would have been low, seasonal and spatially patchy. Yet freshwater plants and peat-forming vegetation show that life persisted where water, soil and local shelter allowed it.

This was not the later familiar Ireland of oak woods, enclosed fields and bog-fringed farms. Nor was it necessarily identical to the high Arctic of today. Palaeoecological reconstruction works by comparison, not by perfect analogy. The responsible conclusion is that parts of north-central Ireland supported open, cold-adapted vegetation around the relevant broad interval. It is an interpretation grounded in biological remains; it cannot tell us the colour of a particular hillside on a particular day.

Animals at the Edge of the Ice

Cave deposits, especially in the limestone country of southern Ireland, add an animal dimension. Castlepook Cave near Doneraile in north Cork has produced one of Ireland's most important Pleistocene faunal collections. Its finds include remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, spotted hyaena and lemmings. Such a list demonstrates that Ireland was visited or inhabited by a far richer cold-stage fauna than its modern mammal community suggests.

It must nevertheless be handled with care. Much of the Castlepook material came from early twentieth-century excavation, before modern recovery methods and stratigraphic recording. A cave is not a simple census of a single living landscape: carnivores may drag prey inside, water can move bones, later disturbance can mix deposits, and separate occupations of the cave can become combined in a collection

drawer. Improved radiocarbon pretreatment has also shown that some older Irish cave dates require reassessment. It is therefore unsafe to picture every listed species standing together outside the cave in 31,692 BCE.

What can be said is more modest and more valuable. The fauna establishes that cold-stage mammals reached Ireland during MIS 3, and that suitable habitats existed at intervals before the Last Glacial Maximum. Reindeer would have been well suited to open ground; hyaenas indicate carnivore activity and the capacity of caves to become dens or bone accumulators; mammoth and giant deer evoke a landscape with substantial grazing resources. Their presence says nothing by itself about human settlement, but it makes an ecologically empty Ireland implausible for every part of this long period.

The Castlepook Human Question

A reindeer femur from Castlepook has made this period especially significant. It has been reported as roughly 33,000 years old and bears a deep linear modification interpreted by Ruth Carden as a cut or chopping mark made with a sharp stone implement during butchery. If that interpretation is upheld, it may represent evidence that Upper Palaeolithic people reached Ireland far earlier than the formerly accepted post-glacial record.

The conditional language is essential. The bone does not establish a village, a camp, a hearth, a stone-tool assemblage, a burial ground or an enduring population. It was recovered from an old cave collection rather than a securely excavated occupation surface. A radiocarbon date identifies the age of the animal's death within a range; it does not automatically date the mark, locate the killing place or reveal how long people remained in the region. Whether a mark was made by a stone edge, carnivore activity, sediment movement or later damage is a specialist taphonomic judgement. Ongoing work at Castlepook has sought surviving undisturbed Pleistocene deposits, but no comparable settlement evidence has yet transformed the case.

Accordingly, the femur should be treated as a potentially momentous clue rather than a licence to invent a Palaeolithic Irish society. At most, it may hint at a brief encounter between people and reindeer in a cold, open landscape. Any visitors would have belonged to mobile Upper Palaeolithic communities whose wider European world included skilled stone technology, hunting knowledge, clothing and social traditions. None of those wider facts can be transferred automatically to Ireland without an Irish archaeological context.

No Kingdoms, No Trade Routes

There is no evidence for political affairs in Ireland around this time: no named communities, leaders, territories, alliances, warfare, diplomacy or institutions. There is likewise no direct Irish evidence for religion, formal learning, art, language or ritual. The silence is not proof that people everywhere lacked beliefs or social relationships; it is a limit of the surviving Irish record. If humans did make short visits, their beliefs and speech remain wholly unknown.

Economy and trade must be described with the same restraint. There were no farms, fields, domesticated herds, metalworking communities or markets. A possible butchered reindeer bone would imply the procurement and processing of animal food, but not a local economy in the later sense. Lower sea levels changed the outlines of the continental shelf and may have narrowed or exposed parts of

surrounding seaways, yet the routes by which animals, and perhaps people, reached Ireland are unresolved. A dry land bridge should not be assumed merely because fauna crossed at some point; swimming, ice, temporary exposed ground and changing coastal configurations complicate the question.

The most important Irish development around 31,692 BCE was therefore environmental rather than political: a changing cold-stage landscape in which ice advances alternated with local windows of open ground, freshwater wetlands and animal movement. Derryvree's tiny preserved plants and Castlepook's cave bones make that world visible, but only in fragments. Their proper lesson is not that Ireland already possessed a recoverable national prehistory in the usual sense. It is that the island's deep past was dynamic, inhabited by resilient ecosystems, and still capable of revising what later generations think they know.

Chapter 010 of 100

31691 BCE

The Castlepook Hindleg^[10]



“31,691 BCE” is a modern chronological label, not a year that can be recovered from the Irish archaeological record. No people then living in or near Ireland used a calendar of this kind, and the available evidence cannot identify an event in a particular season, let alone a particular year. The responsible frame is therefore broader: this notional date falls in the Late Pleistocene, within Marine Isotope Stage 3, during the later part of the last Ice Age. In Irish terms it lies approximately within a span of c. 35,000–33,000 calibrated years before present, though individual scientific dates retain substantial uncertainty.

There were no states, rulers, written languages, named peoples or diplomatic relations that can be identified in Ireland at this depth of time. The nearest evidence is instead a small and difficult archive of sediments, pollen, plant remains, insects, animal bones, glacial landforms and one especially provocative object: a reindeer femur from Castlepook Cave, near Doneraile in north County Cork. Together these sources reveal a cold and changing north-west European landscape. They do not provide a conventional political history. Their importance lies in showing what Ireland may have offered to animals, and perhaps to occasional human visitors, shortly before the island was overwhelmed by the expanding last ice sheet.

A Calendar Label, Not a Dated Episode

The distinction between radiocarbon years and calendar years matters particularly here. Radiocarbon ages are measured against the conventional present of AD 1950 and must be calibrated because atmospheric carbon levels have varied over time. Beyond the range covered by annually dated tree rings, the resulting calendar estimates are necessarily less fine-grained. A single measurement from an old Irish deposit should not be translated into an exact BC year and then treated as a date on a diary page.

The principal environmental comparison comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands preserved between two bodies of glacial till beneath a drumlin. Organic material from the deposit produced a determination of $30,500 \pm 1,170/1,030$ radiocarbon years BP. With calibration and its large uncertainty taken seriously, it illuminates a broad period rather than one moment. It is commonly associated with the Derryvree cold phase, an ice-free interval before the principal late-glacial advance across Ireland.

This is not evidence that Derryvree and Castlepook were occupied or used at precisely the same time. They are separated by more than 300 kilometres, and each record has its own formation history. Yet both belong to the same larger problem: reconstructing an Ireland that was neither the familiar green island of later millennia nor necessarily a uniform sheet of ice. Conditions, ice margins and habitats changed markedly across time and place.

Derryvree's Wet Tundra

The Derryvree deposit is among the clearest Irish glimpses of the environment available around this broad horizon. Its pollen, plant macrofossils and insect remains point to open, treeless vegetation under periglacial conditions. Mosses, sedges and arctic-alpine plants occurred in wet ground around freshwater. Fossils include dwarf willow, mountain avens and bogbean, species capable of surviving in cold landscapes but requiring particular niches of moisture, shelter or seasonal growth. The old term “muskeg” has sometimes been used for this setting: wet, mossy and sedgy ground, with pools and saturated patches, rather than an uninterrupted dry steppe.

The evidence supports an image of low vegetation, exposed soils, frost action and shallow water in at least part of south Fermanagh. It does not support a claim that the whole island looked identical. Plant pollen can travel, deposits preserve some habitats better than others, and a road-cut section is a local sample. Nevertheless, the lack of woodland indicators in good condition, together with the cold-adapted flora and fauna, makes a wooded Ireland implausible for this interval. Tree cover, settled farmland and the peat bogs familiar today belonged to much later environmental worlds.

Seasonality would have been a governing fact of life for every animal in such country. Long winters, frozen or waterlogged ground, limited winter forage and changing snow cover would shape movements across the landscape. In summer, damp basins and river margins may have offered concentrated plant growth. The terrain was dynamic: erosion, sediment wash, frost heave and advancing or retreating ice could repeatedly alter routes and habitats. “Ireland” is useful as a geographical shorthand, but the coastlines and surrounding seas were not those of the modern island. Lower global sea levels exposed extensive continental-shelf landscapes and reduced, though did not necessarily remove, the difficulty of movement between land areas.

Castlepook and the Animal Record

Castlepook Cave, also called Mammoth Cave or Doneraile Cave, is the key southern Irish faunal archive. Excavations in the early twentieth century recovered a large collection of Pleistocene animal remains, now principally associated with the National Museum of Ireland. Subsequent study and radiocarbon dating showed that the cave assemblage includes animals from more than one phase of the Late Pleistocene. Re-dating published in 2020 demonstrated that several Castlepook specimens were significantly older than earlier measurements had suggested, pushing some of the fauna back into Marine Isotope Stage 3.

That revision is consequential, but it also enforces caution. A cave bone collection is not automatically a snapshot of a single living community. Carnivores may drag remains into caves; water and sediment can redistribute them; scavenging, trampling and excavation may damage surfaces; and antiquarian digging often removed deposits without the stratigraphic recording expected today. Castlepook can therefore demonstrate that particular species reached Ireland during broad phases of the Ice Age, while leaving open whether every animal represented was contemporary with every other one.

Its fauna nevertheless indicates that Ireland was connected ecologically to the wider cold-stage world of north-west Europe. Reindeer are central to the evidence, alongside remains attributed across the cave sequence to animals including woolly mammoth, giant deer, brown bear, wolf, fox, hare, collared lemming and spotted hyaena. This was not an isolated island fauna in the modern sense. It was a fluctuating assemblage of animals able to exploit open ground, cold climates and the changing land-and-water geography of the north Atlantic margin.

Spotted hyaenas are especially revealing. Their presence does not mean an African-style savannah existed in Cork. Ice Age spotted hyaenas ranged much farther north in Europe than their modern descendants. At Castlepook they also offer a practical warning about the bone record: a cave may have served as a carnivore den or a place into which scavenged carcass parts were carried. A limb bone found there need not mark the place where an animal died, was hunted or was first butchered.

The Reindeer Femur

The Castlepook reindeer femur is the archaeological object most directly relevant to this article's approximate date. It bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone edge while the bone was fresh. County Cork heritage material has presented the specimen as dating to about 31,000 BC, and public reporting has described it as evidence for the butchery of reindeer by Stone Age hunters roughly 33,000 years ago.

If that interpretation is confirmed, its implications are considerable. It would show that a person used a sharp lithic implement on a reindeer carcass in Ireland during the Upper Palaeolithic, more than twenty millennia before the long-recognised Mesolithic settlement of the post-glacial island. It would make Ireland part of the wider human geography of Late Pleistocene north-western Europe, where mobile hunter-gatherers followed resources through severe and unstable climates.

But the claim must remain properly scaled. The femur dates the animal's death, not an exact act of cutting. The identification of the incision as a tool mark is a specialist interpretation distinct from the radiocarbon measurement. The bone derives from an old cave collection rather than a modern excavation of an intact floor containing associated tools and hearths. No securely associated Upper Palaeolithic lithic assemblage, fireplace, house site, burial, human bone, ornament or artwork has yet been published from Ireland for this period. Nor can the find tell us whether people killed the reindeer, scavenged it, removed meat, hide, sinew or marrow, or processed the carcass elsewhere before carnivores carried the bone into the cave.

The most defensible conclusion is that brief human activity in Ireland is possible, and that the Castlepook femur may preserve an exceptionally early trace of it. Permanent settlement, continuous occupation and descent from these possible visitors to later Irish communities are not established.

Life Without a Social Record

Because the Irish evidence is so slight, it cannot responsibly sustain claims about political affairs, conflict, diplomacy, kinship systems, language, religion or learning. There is no basis for imagining chiefs, tribes, territorial borders or organised warfare in Ireland around this date. Equally, there is no Irish evidence for ceremonial monuments, cave art, formal burial, trade goods or religious practice. The sophisticated art and technologies known from Upper Palaeolithic Europe provide a useful comparative setting, but they cannot be transferred to Ireland as if absence of evidence were proof of their presence.

If people entered the island, their economy was almost certainly based on immediate knowledge of animal movements, plant resources, weather and safe passage through a difficult landscape. A reindeer carcass could provide meat, fat, marrow, hide, sinew and bone: resources with potential value to mobile hunter-gatherers. That is an inference from the animal and from wider Upper Palaeolithic practice, not a direct description of a Castlepook camp. There is no sound evidence for farming, herding, pottery, metalworking, permanent houses or long-distance exchange networks centred on Ireland.

An Island Before the Ice

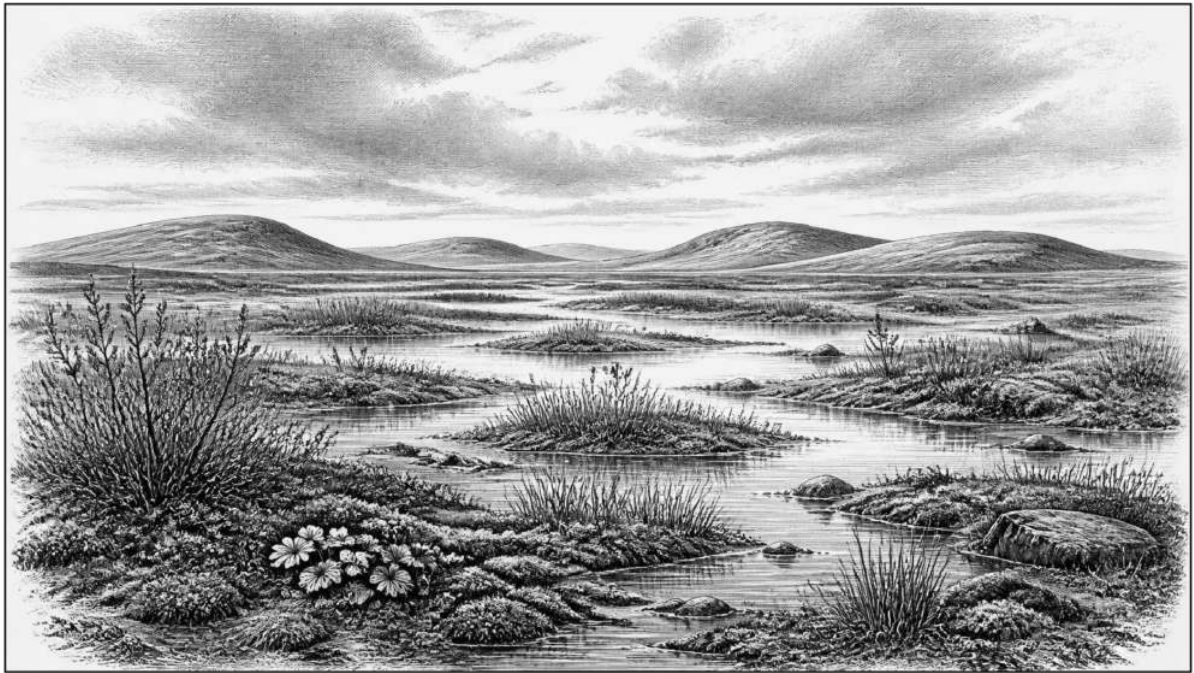
The larger development around the notional year 31,691 BCE was environmental change. Reconstructions of the British–Irish Ice Sheet show growth and reorganisation before its later maximum, while also acknowledging major gaps in dating control. By c. 27,000–23,000 years BP, ice reached much more extensive limits and covered Ireland and large areas of its continental shelf. Around the earlier interval considered here, however, the evidence allows for ice-free refuges and cold open habitats in some areas, alongside growing ice masses and local upland glaciation.

That precarious setting explains both the importance and the fragility of the record. The later ice sheet scoured landscapes, moved sediments and destroyed or buried many sites that might once have preserved human traces. The absence of known camps is therefore not proof that no person ever arrived; neither does one marked bone establish a populous or enduring occupation. Ireland at this time is best understood as an intermittently habitable Ice Age frontier: a place of wet tundra, mobile herds, carnivores and advancing ice, known to archaeology through fragments that demand restraint as much as imagination.

Chapter 011 of 100

31690 BCE

The Birm-166 Horizon^[11]



“31,690 BCE” is a modern chronological label, not a year that anyone in prehistoric Ireland could have counted, named or remembered. It corresponds arithmetically to about 33,640 calendar years before 1950, the conventional ‘present’ of radiocarbon dating, but the evidence cannot identify an event in that single year. The responsible subject is therefore Ireland during a broad late-Pleistocene interval: Marine Isotope Stage 3, within the last Ice Age and before the fuller expansion of the Last Glacial Maximum.

The best Irish evidence nearest this nominal point is not a settlement, ruler or battle, but a layer of organic sediment labelled Birm-166. Exposed during roadworks at Derryvree, near Maguiresbridge in County Fermanagh, it preserves a fleeting geological and ecological archive from a landscape later buried beneath glacial deposits. Alongside it, the cave-bone assemblage at Castlepook near Doneraile, County Cork, offers striking but complicated evidence for the animals that ranged through Ireland and for the possibility of very early human visits.

Dating a Landscape

Radiocarbon results of this antiquity are not calendar dates. Birm-166, taken from Derryvree organic silts, produced a determination of 30,500 radiocarbon years before present, with a substantial uncertainty of +1,170 and –1,030 years. Calibration is necessary because atmospheric carbon-14 has varied through time. Later scholarship places the result broadly within c. 36,900–31,700 calibrated years before present. That broad span includes the modern reference-point of 31,690 BCE, but it emphatically does not turn the Derryvree deposits into a record of one year, one generation, or even one unbroken century.

This distinction matters because the older language of ‘stages’ and ‘interstadials’ can sound sharper than the evidence allows. The Derryvree horizon has been associated with a cold, non-glacial interval within the Irish Midlandian sequence and, more widely, with the fluctuating climates of MIS 3. Its sediments accumulated over time; plant remains, insect fragments and pollen are environmental samples rather than a dated historical document. The calibrated range is the proper measure of confidence.

Silts Between the Tills

Derryvree was revealed when a road cutting sliced through a drumlin, one of the elongated hills characteristic of glaciated ground. Beneath the surface lay two thick and distinct tills: unsorted sediment deposited by glacier ice. Between them were freshwater silts and fine sands, enriched with organic material. The sequence is powerful evidence. Ice had affected the site before the organic bed formed, while a later ice advance sealed it beneath another till. In the intervening interval, the locality supported standing or slow-moving freshwater, wet ground and plants.

That does not mean the whole island was comfortably ice-free. Ireland’s ice cover was changing on regional and millennial scales. Recent reconstructions suggest that the British–Irish Ice Sheet was beginning a major phase of growth around 31,000 years ago, with upland and northern ice centres developing before much wider expansion. Other dated deposits indicate that parts of north-central Ireland had remained ice-free until at least roughly 34,000 years ago. Around the nominal date in question, it is therefore safer to picture a geographically uneven, changing world than a single all-Ireland map: periglacial lowlands and wetlands in some places, ice and accumulating snowfields in others, and advancing ice margins as an approaching long-term threat.

The coming transformation was immense. By the Last Glacial Maximum, broadly c. 26,000–20,000 years ago, ice would cover almost all of Ireland and extend across adjoining shelves. Yet that lies thousands of years after the Derryvree deposit’s central age. The Birm-166 horizon captures not an island already smothered by the maximum ice sheet, but an earlier cold phase in which water, vegetation and animal life still left recoverable traces on exposed ground.

A Treeless Wetland World

The Derryvree fossils indicate open tundra vegetation and a periglacial climate. Herbaceous pollen was poorly preserved but significant; plant macrofossils included mosses and sedges, while the broader flora points towards wet, cold ground rather than woodland. Mountain avens, dwarf willow and other northern or Arctic-alpine elements have been associated with this kind of Irish Pleistocene environment. The term ‘tundra’ should not conjure a featureless sheet of snow. In summer, shallow pools, sedge-rich margins, mossy ground and low-growing herbs could create a patchwork of colour and food. The ground was nevertheless treeless, exposed and subject to a brief growing season and severe winters.

Insect evidence reinforces the interpretation. Cold-adapted beetles and other small remains are more useful than their size suggests: many have narrow environmental tolerances, allowing palaeoecologists to identify conditions that no longer prevail locally. Together, the insects, pollen and plant remains support a landscape of seasonally frozen soils, freshwater hollows and sparse to open vegetation. They do not provide a weather report for 31,690 BCE, but they establish the character of the wider climatic regime.

South-west Ireland offers another, different sort of evidence. Broken calcite formations in Crag Cave, County Kerry, have been uranium-thorium dated to episodes of growth during MIS 3. Because shallow-cave speleothems require water moving through unfrozen ground, their intermittent formation indicates

climatic ameliorations within an overall cold period. This does not make Kerry temperate woodland, nor does it date Derryvree precisely. It shows why Ireland's climate at this depth of time should be understood as unstable: colder and less cold phases, varying moisture and local ice conditions succeeded one another across many millennia.

Animals at Castlepook

Castlepook Cave in north Cork is the principal Irish archive for large mammals before the Last Glacial Maximum. Excavations from 1904 onwards recovered more than 2,000 bones from its limestone galleries. The assemblage includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, collared and Norwegian lemmings, and spotted hyena. Not every specimen necessarily belongs to the same moment: cave deposits can be disturbed by water, animals, excavation and later intrusion. Still, the fauna demonstrates that Ireland supported, or was visited by, a remarkable cold-stage animal community during this broad period.

The cave was not a simple snapshot of animals grazing outside its entrance. Spotted hyenas were likely among the agents that accumulated bone, carrying carcass parts into their den. A cave can be a shelter, trap, carnivore lair, drainage route and sediment storehouse in successive periods. Thus, mammoth or reindeer remains prove the presence of those species in the wider regional environment, but a bone's final resting-place does not automatically identify where an animal died or how it arrived. Castlepook's old excavations are indispensable, but their recording standards cannot meet those of a modern, fully stratified excavation.

Even so, the animal evidence has important implications for regional change. The presence of reindeer and lemmings accords with cold, open habitats; mammoth and giant deer indicate that enough forage was available somewhere within the wider landscape mosaic. Carnivores such as wolves and hyenas point to a functioning food web rather than a sterile ice margin. Ireland was not yet the historically familiar wooded island of later millennia. It was a north-west European Ice-Age landscape, environmentally connected to changing habitats around Britain and the exposed or altered seas, although the precise routes by which particular animals arrived remain uncertain.

The Marked Reindeer Bone

One Castlepook object bears directly on the question of people. A reindeer femur has a deep incision interpreted by zooarchaeologist Ruth Carden as a mark made with a sharp stone implement during the processing of a carcass. County Cork heritage material has presented the specimen as dating to around 31,000 BCE. If the mark is anthropogenic and contemporary with the animal's death, it is potentially the earliest evidence for human activity in Ireland by a very large margin.

That possibility deserves attention, but not exaggeration. The bone derives from an old cave collection, not from a modernly excavated occupation floor with securely associated tools. The date concerns the animal bone, rather than directly dating the making of the mark. A single modified bone cannot establish whether people killed the reindeer, scavenged it, removed meat, hide, sinew or marrow, or processed the carcass elsewhere. It cannot identify their number, language, ancestry, season of travel or relationship to later Irish populations.

Nor has an Upper Palaeolithic settlement of comparable age been securely demonstrated in Ireland. The renewed 2022 excavation at Castlepook located surviving cave sediments and recovered animal remains, but reported no cultural artefacts. There are no published hearths, dwelling floors, burials, art

assemblages or stone-tool concentrations that could demonstrate permanent settlement around this date. The most cautious conclusion is also the most significant: brief human incursions into Ireland during MIS 3 are possible, and the marked femur may preserve evidence of one; continuous occupation remains unproven.

Society Beyond Recovery

For that reason, ordinary historical categories reach their limit. There is no evidence for political institutions, named communities, diplomacy, warfare, territorial rule, religion, formal learning, monuments or exchange networks in Ireland at this point. To invent them would turn a sparse archaeological question into fiction. There is likewise no basis for assigning the Castlepook mark to a particular archaeological culture known from mainland Europe or Britain.

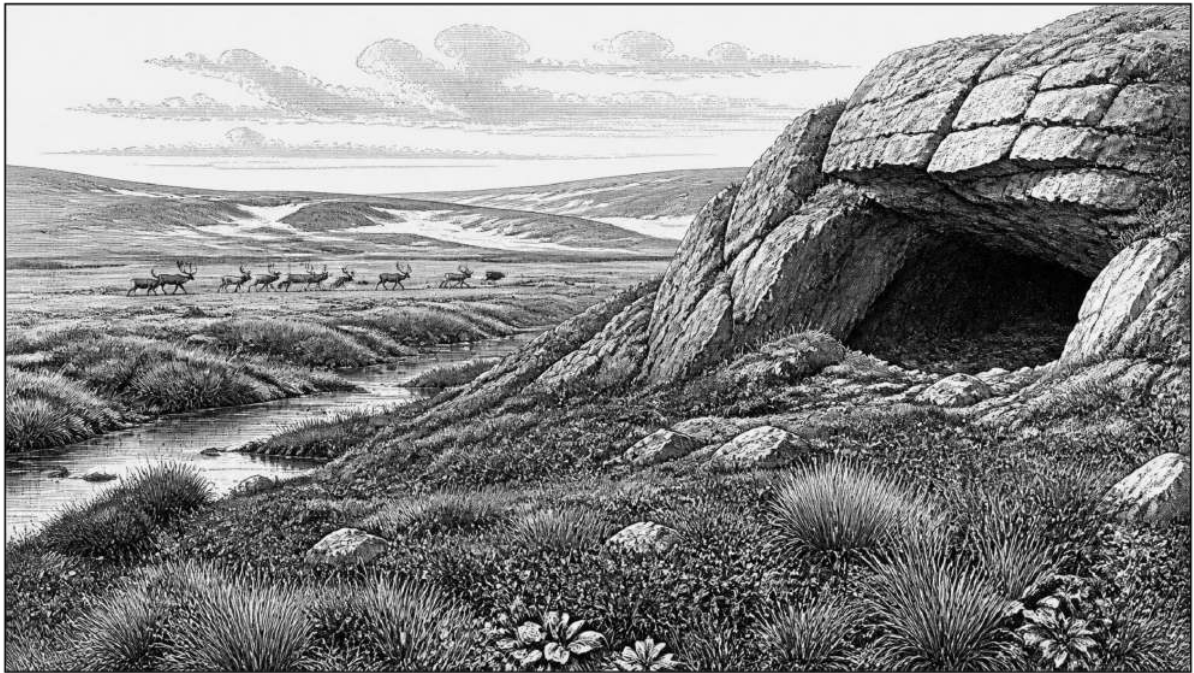
A restrained inference is possible if people did enter the island. Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe relied on practical knowledge of animal movement, seasonality, stone-working and the uses of carcasses. Reindeer could provide meat, fat, marrow, hide, sinew and bone. Such knowledge would be an adaptive economy, not ‘trade’ in the later historical sense. It should be described as a comparative possibility, not as a documented Irish society.

The clearest story for this point in deep time is therefore one of environment, mobility and survival. At Derryvree, freshwater silts trapped between tills preserve evidence for treeless tundra and cold wetland. At Castlepook, bones preserve a diverse Ice-Age fauna and a single, debated clue to human action. Both records are fragile survivors of later glaciation. Their value lies not in supplying an imagined annual chronicle, but in showing that Ireland around the calibrated range relevant to 31,690 BCE was a changing frontier of water, tundra, animals and encroaching ice.

Chapter 012 of 100

31689 BCE

Castlepook's Hyaena Accumulation ^[12]



The label 31,689 BCE is a modern chronological convenience, not a date at which Irish archaeology can identify a particular event. Expressed in the archaeological convention of years before AD 1950, it is approximately 33,600 calendar years ago. No contemporary Irish calendar, written testimony, settlement sequence or annually resolved environmental record exists from which to reconstruct a single year. The responsible approach is therefore to place this nominal point within the fluctuating middle part of the Last Glacial Period, or Marine Isotope Stage 3 (MIS 3), and to use broad calibrated ranges and carefully dated deposits.

For Ireland, the most important evidence relevant to this distant horizon comes not from houses, graves or tools but from caves, fossils, sediments and mineral deposits. The most conspicuous site is Castlepook Cave, also called Mammoth Cave or Doneraile Cave, in north County Cork. Its animal-bone assemblage has made the area central to debates about Ireland's Ice Age landscape and the possibility of very early human visits. Yet it also demonstrates the limits of the evidence: a cave containing bones is not automatically a human camp, and a radiocarbon date on an animal does not prove people were present when that animal died.

A Date Without a Recorded Year

Radiocarbon measurements are reported in radiocarbon years before present and must be calibrated against changing levels of atmospheric carbon-14 to produce calendar ranges. At more than thirty millennia ago those ranges can be broad. The modern IntCal20 calibration curve is designed for Northern Hemisphere terrestrial samples back to 55,000 calendar years before present, but it does not transform an Ice Age specimen into evidence for a named year. A date written as 31,689 BCE should consequently be read as a point within a much wider span, not as an anniversary in prehistoric Ireland.

The period belongs to MIS 3, conventionally extending from about 59,000 to 29,000 years before present. It was colder than today but was not an unchanging deep freeze. Greenland ice-core records, European pollen sequences and Irish cave calcite all indicate abrupt climatic oscillations on millennial scales. In south-west Ireland, uranium-thorium dating from Crag Cave shows repeated episodes of speleothem growth during the last glacial cycle. Because cave calcite requires liquid water, those phases indicate intervals in which local mean annual temperatures were likely above freezing. Strong late-MIS-3 growth is evidence for climatic amelioration, though it cannot supply a precise weather report for north Cork in one nominal year.

Open Country in North Cork

At around this point in the wider glacial cycle, Ireland was not the wooded island familiar today. Direct environmental records are patchy, often disturbed or removed by later ice, but the fauna from Castlepook and other Irish sites indicates a cold, largely open landscape capable of supporting substantial herbivores and their predators. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena are represented among the Castlepook material or related collections. Such animals imply a mosaic of open grassland, herb-rich tundra, dwarf-shrub vegetation, wet ground and sheltered places rather than dense forest.

This list must not be converted into a painted scene in which every species stands together at the cave mouth. The old excavations recovered bones from complex deposits, and the specimens were not all laid down simultaneously. Some have later direct dates, while others can only be assigned broadly by association. The fauna nevertheless establishes an important point: during favourable parts of the last glacial cycle, southern Ireland supported, or at least received, a more diverse cold-stage mammal community than the later island would possess.

Spotted hyaena is especially significant. Castlepook provides Ireland's best-known evidence for this Ice Age carnivore. Hyaenas are powerful bone accumulators: they can carry carcass parts into dens, gnaw and break bones, and mix material deposited at different times. Their presence makes the cave a record of animal behaviour as well as a possible archive of human activity. It cautions against reading every fracture, scrape or concentration of bone as the result of hunting or butchery.

The Reindeer Bone Question

Modern re-examination of museum collections has altered the chronology of the Castlepook fauna. Research associated with the Irish Quaternary Fauna Project and later work by Ruth Carden and colleagues showed that several earlier radiocarbon results were too young. Direct determinations now place parts of the southern Irish fauna in MIS 3, with individual results from Castlepook and other sites extending across a substantial period rather than forming one single assemblage.

A reindeer femur fragment from Castlepook has attracted particular attention because it bears a deep linear mark interpreted by Carden as consistent with a sharp stone tool used on fresh bone. The bone has been publicised as dating to roughly 33,000 radiocarbon years before present. Calibration turns this into a calendar range of several millennia, principally earlier than the nominal point of 31,689 BCE, rather than a date for a visit in that exact year. The claim is potentially important because, if the mark is confirmed as a human cut or chop mark and is securely related to the bone's age, it would indicate a human presence in Ireland far earlier than the previously secure Late Upper Palaeolithic evidence.

That conditional language matters. The bone was recovered during early twentieth-century cave investigations, not from a modern excavation with the full spatial, sedimentary and microscopic controls expected today. Its date establishes when the reindeer lived; the diagnosis of the incision is a separate taphonomic judgement. Carnivore teeth, sediment abrasion, breakage and excavation history all have to be excluded. Nor has a securely stratified MIS-3 stone-tool assemblage, hearth, dwelling surface, human bone or burial been published from Ireland. The evidence therefore supports a serious hypothesis of a brief human encounter with a reindeer, not a demonstrated settlement or a population history.

People, If Any, and the Limits of Analogy

Across north-west Europe, *Homo sapiens* communities of the Upper Palaeolithic hunted, gathered, made sophisticated stone, bone and antler equipment, used fire and maintained long-distance social connections. It is reasonable to say that any people who reached Ireland in MIS 3 would have needed comparable practical knowledge: clothing, fire management, seasonal mobility and an ability to travel through a cold, changing world. It is not responsible to assign them a particular named archaeological culture, language, belief system or homeland from one marked bone.

There is likewise no basis for describing political affairs, diplomacy, organised warfare, trade networks, religion or artistic traditions in Ireland at this date. Such subjects require evidence of communities, repeated occupation, objects or structures; none survives for the nominal year. If people did enter the island or its then-different landmass, their visit may have been short and exploratory, perhaps linked to hunting or scavenging. That is interpretation by analogy with wider European hunter-gatherer life, not an observation recovered from Castlepook.

The distinction becomes clearer when Castlepook is compared with Alice and Gwendoline Cave in County Clare. A butchered brown-bear kneecap from that cave has two consistent calibrated ranges centred around 12,800–12,600 calendar years before present. It is later by more than twenty millennia, but it is stronger evidence because its cut marks, dating and excavated context have been studied in detail. Ireland's later Upper Palaeolithic visitors cannot simply be projected backwards to make an earlier occupation continuous.

Routes, Water and Approaching Ice

The map was also different. Lower global sea levels exposed areas of the continental shelf, and the Irish Sea basin, Celtic Sea and land connections beyond Ireland changed repeatedly as ice and water volumes altered. It would be misleading, however, to imagine an uncomplicated dry highway from Britain or the Continent. Ice margins, rivers, estuaries, marine channels and seasonal conditions governed movement. The precise accessibility of north Cork at any single moment around 33,600 calendar years ago remains uncertain.

Within several thousand years, the climatic trajectory led towards the Last Glacial Maximum. Marine and terrestrial research shows the British-Irish Ice Sheet reaching major extent across the Celtic shelf roughly 27,000–24,000 calendar years before present, and later ice covered most or all of Ireland. This expansion was consequential for archaeology: advancing ice eroded, buried and rearranged many older land surfaces. The scarcity of Irish MIS-3 sites is therefore not proof that animals or people were absent; it is partly a consequence of poor preservation and survival.

For ordinary life, the clearest history at 31,689 BCE is animal rather than human. Herbivores moved through exposed country; carnivores exploited them; caves offered dens, traps and occasional shelters; water, frost and thaw shaped every route. North Cork's limestone cavities preserved fragments of that world which open-air sites and soils largely lost. The Castlepook material makes Ireland visible within the wider Ice Age ecology of Atlantic Europe, while its ambiguities prevent the false certainty of a fully peopled prehistoric scene.

Thus this nominal year should be remembered not for a recorded Irish event but for a critical archaeological threshold. Ireland around 33,600 calendar years ago was a dynamic glacial-edge landscape, environmentally capable of supporting reindeer and mammoth as well as hyaenas and wolves. A marked reindeer bone raises the possibility that people briefly entered that landscape. It does not yet demonstrate an Irish society, a settlement, or a dated act in 31,689 BCE. Continued excavation at Castlepook, improved direct dating and microscopic reassessment of bone surfaces are the means by which that narrow but important possibility can be tested.

Chapter 013 of 100

31688 BCE

Hyaena Hall's Bone Traffic^[13]



31,688 BCE is not a date that can be recovered from the Irish archaeological record as a single year. It is a modern calendar label, applied retrospectively to a period for which there are no written records, named communities, annual chronologies or securely dated events. Expressed in the conventional archaeological system of “before present” (where present is AD 1950), it sits at roughly 33.6 thousand calendar years ago. That places it within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the Late Pleistocene, rather than within a historically meaningful Irish year. The most responsible account therefore concerns a broad interval around this point, using calibrated ranges where available and separating what fossils demonstrate from what historians may cautiously infer.

An Ireland Before the Ice Maximum

At about 33,600 calendar years before 1950, Ireland had not yet reached the fullest extent of the last British–Irish Ice Sheet. The Last Glacial Maximum lay ahead, principally in the later period around 27,000 to 20,000 years ago, although glacier growth and the precise position of ice margins varied greatly by region and remain subjects of active research. Ireland was consequently neither a uniformly ice-covered blank nor a benign green island. It was part of a northern, cold-stage world in which conditions altered sharply over millennia and sometimes much more quickly. The evidence supports a changing mosaic of ice, exposed ground, river systems, lake or wetland basins, sparse vegetation and local habitats capable, at intervals, of sustaining large mammals.

MIS 3 was marked by repeated abrupt shifts between colder stadial and relatively milder interstadial conditions. That does not allow a historian to state the weather in Ireland in 31,688 BCE, still less to describe a particular season. It does explain why a simple image of an unchanging “Ice Age” is

misleading. Habitable areas could expand or contract; plant cover, snow conditions and animal movements could change; and routes across what are now seas could become more or less practicable. Lower global sea levels altered the shape of the Irish Sea basin, but the available evidence does not justify imagining a permanent, straightforward land bridge to Britain or the continent at this exact moment.

Castlepook and the Cave Record

The clearest Irish evidence relevant to this distant interval comes from limestone caves in the south, above all Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. The cave lies in the Awbeg Valley below the Ballyhoura Hills. Excavations undertaken between 1904 and 1908 recovered a remarkable quantity of animal bone, including material attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Castlepook is particularly important because it has yielded Ireland's only known spotted-hyaena remains and because it preserves both pre- and post-Last Glacial Maximum faunal evidence.

Yet Castlepook is not a sealed snapshot of a single landscape or single generation. Much of its material was collected before modern excavation standards: deposits were disturbed, bones were gathered from different chambers and passages, and the fine stratigraphic relationships needed to prove contemporaneity were often lost. Caves are also active filters. Hyaenas can drag carcass parts underground; bears may die in dens; scavengers gnaw bone; water, sediment and roof falls shift material; and later excavators can mix it again. A cave assemblage is therefore evidence that particular animals occurred in the wider region at some stage, but it cannot automatically reveal where every creature lived, died or was killed.

Modern radiocarbon work has made this caution even more necessary. The Irish Quaternary Fauna Project established that a broad range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. Subsequent redating, using improved pretreatment of ancient bone, found that some older determinations from southern Irish caves were substantially too young. At Castlepook, reassessed dates suggested a deeper MIS 3 antiquity for parts of the fauna and raised the possibility that giant deer and spotted hyaena had disappeared locally before the Last Glacial Maximum. Thus a calendar label around 31,688 BCE should not be used to claim that every familiar Castlepook species stood together in the Awbeg Valley at one moment.

Animals, Not a Census

Nevertheless, the fauna offers a powerful view of the ecological possibilities of Pleistocene Ireland. Reindeer and lemmings point towards cold, open settings; Arctic fox and mountain hare reinforce that impression. Woolly mammoth and giant deer indicate that at least some landscapes had enough food and accessible ground for very large herbivores. Brown bear, wolf and spotted hyaena show that predators and scavengers were part of the same wider ecological theatre. In particular, hyaena bones, teeth and coprolites make it likely that Castlepook functioned at least partly as a carnivore den, a place through which prey remains moved rather than a human settlement awaiting discovery.

This was not the Ireland of later peat bogs, broad oak woods, farms, monuments or enclosed fields. Treeless or lightly vegetated ground, hardy grasses and herbs, exposed mineral soils, patches of wetland and seasonally severe conditions are more appropriate general terms. Exact local vegetation at 31,688 BCE cannot be reconstructed from a securely dated Irish pollen diagram for that calendar year. The

animal record instead supports an interpretation of varied cold-stage habitat, likely changing through time and across short distances. It would have been an environment shaped as much by mobility—of herds, predators, ice and meltwater—as by permanent places.

A Possible Human Trace

The most arresting, but least conclusive, human question concerns a reindeer femur from Castlepook. Ruth Carden identified a deep mark on the bone as consistent with cutting or chopping by a sharp stone implement while the bone was fresh. County Cork's heritage publication presents the specimen as evidence that Palaeolithic hunters may have butchered reindeer in Ireland around 33,000 years ago. If that interpretation is sustained by further analysis, it would push possible human activity on the island far earlier than the securely established terminal-Pleistocene evidence from County Clare. It would represent a moment of carcass processing, not proof of a village, a population or a continuous settlement.

The distinction matters. A radiocarbon determination dates the death of the animal within a probability range; it does not, by itself, date a mark, a visit to the cave or a named human group. Nor have securely associated stone tools, hearths, dwellings or human remains been recovered from a Castlepook context of this age. The National Museum of Ireland accordingly continues to describe unequivocal Palaeolithic human evidence in Ireland as absent, while research and renewed excavation test the much earlier possibility. The sound conclusion for around 31,688 BCE is not that Ireland was certainly inhabited, but that a potentially significant trace demands careful scrutiny.

No Politics, No Proven Diplomacy

Nothing in the evidence permits political history in the usual sense. There were no recorded kingdoms, leaders, boundaries, alliances, wars, diplomatic exchanges or institutions. Nor can language, ancestry, religious belief, ritual practice, kinship rules or artistic traditions be assigned to Ireland at this point. Even if small groups of Upper Palaeolithic people did reach the island intermittently, the archaeological record does not reveal their names, identities or social organisation. It would be anachronistic to connect them with later Irish peoples, Gaelic culture or any medieval and modern idea of Ireland.

Likewise, there is no direct evidence for an Irish economy of the kind later historical writing recognises: no agriculture, herding, market exchange, metalwork, boats, houses, roads or trade network can be documented for this date. A possible act of reindeer butchery would imply knowledge of animal resources and stone-edged tools, but it cannot establish whether the animal was hunted, scavenged or encountered after death. At most, the wider north-west European context makes seasonal movement by highly mobile hunter-gatherers plausible. That is an interpretation based on comparative archaeology, not a demonstrated Castlepook community.

A Fragile Northern Frontier

The period's central Irish development was environmental rather than political: the approach to a more severe glacial world. As the British–Irish Ice Sheet expanded towards its later maximum, landscapes able to support mammals and any visiting people became increasingly vulnerable to cold, ice advance and

altered coastlines. The subsequent ice sheet also destroyed or buried much evidence. This helps explain why the record is concentrated in caves and scattered deposits rather than open-air sites, and why absence of evidence must not be mistaken too readily for proof of total absence.

For Ireland around 31,688 BCE, then, the responsibly reconstructed scene is one of a changing cold-stage frontier. Castlepook's bones establish that an unexpectedly rich set of mammals reached this far-western landscape during MIS 3. They show an Ireland connected, at intervals, to wider European ecological processes. The contested reindeer femur offers a tantalising possibility that people also reached it. But the decisive facts remain modest: there is no calendar-year event, no known settlement and no recoverable political or cultural narrative. What survives is a cave archive of animals, movement and uncertainty—and that uncertainty is itself an important part of Ireland's deepest past.

Chapter 014 of 100

31687 BCE

Fermanagh's Frost Mosses^[14]



“31,687 BCE” is a modern chronological label, not a recoverable year in Ireland’s prehistoric record. No calendar, written testimony, annual environmental sequence or securely dated settlement allows events to be placed in this particular year. Converted mechanically to the archaeological convention of years before AD 1950, it falls at about 33,636 years before present (cal BP). That conversion is only a way of locating the label within deep time, not a precise scientific date. The responsible historical subject is therefore Ireland during a broad interval in the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable phase of the Last Ice Age.

A Date Within Ranges

At this depth of time, radiocarbon dating produces ranges rather than anniversaries. A laboratory measures the remaining carbon-14 in suitable organic material; because atmospheric carbon-14 has varied greatly through time, the result must be calibrated against internationally maintained reference curves. Uncertainties in the original measurement, contamination, the nature of the sample and irregularities in the calibration curve all matter. A bone date normally estimates when the animal died, while a layer of silt may represent accumulation over years, centuries or longer. Neither can identify a named event in a numbered BCE year.

The most useful Irish environmental sequence close to this horizon was found at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed organic freshwater silts and fine sands trapped between two thick, distinct tills: sediments left by separate episodes of glacial ice. The organic series gave a conventional radiocarbon age of 30,500 radiocarbon

years BP, with a large error range. Later calibration has placed it broadly at about 36,900–31,700 cal BP. The nominal year considered here, roughly 33.6 thousand cal BP, lies within that wide interval, but the deposit cannot be assigned to the year itself.

Derryvree establishes an important point. At some point during this lengthy span, the locality was not beneath overriding glacier ice. Fresh water collected; fine sediment accumulated; plants, insects and other organic matter entered the basin; and later ice advanced across the district and sealed the evidence. It does *not* prove that all Ireland was simultaneously ice-free, or that Fermanagh's conditions prevailed unchanged in Cork, the western seaboard or the Irish Sea basin. Ice sheets are regional, dynamic systems, and the surviving evidence is fragmentary.

An Open, Wet Landscape

The Derryvree flora and fauna indicate open tundra vegetation and a periglacial climatic regime: a landscape shaped by persistent cold and seasonal freezing, rather than the familiar wooded, farmed Ireland of later millennia. Pollen and plant macrofossils point to herbs, grasses, sedges, mosses and low-growing shrubs. Wet hollows and shallow freshwater margins could sustain especially rich patches of moss and sedge, even where exposed ground elsewhere was sparse. The evidence does not support a continuous blanket of snow or an empty polar desert. Nor does it support oak woodland, enclosed fields, peat-cuttings or any recognisable rural landscape.

Such ground would have changed with drainage, slope, shelter and season. Frost could fracture exposed rock and disturb surface sediments; streams and meltwater moved material through valleys; shallow basins offered standing water. The drumlin that preserved Derryvree is itself a reminder that the terrain visible today is partly the result of repeated glacial remodelling. Later ice eroded older surfaces, shifted sediments and obscured many places where earlier evidence might once have survived. This destructive history helps explain the extraordinary scarcity of Palaeolithic traces in Ireland, though it cannot be used as a licence to imagine lost camps wherever evidence is absent.

The wider climatic setting was becoming more severe and unstable. Reconstructions of the British–Irish Ice Sheet show major expansion during the later stages of MIS 3, with the Scottish component advancing rapidly around 32,000–31,000 years BP and the ice sheet subsequently growing to its greatest volume around 23,000 BP. The date considered here belongs before that maximum, during a long transition rather than a simple before-and-after moment. Ireland may therefore be understood as a changing mosaic of ice, ice margins, exposed terrain, waterways and cold-adapted habitats whose exact arrangement cannot be mapped year by year.

Castlepook's Animal Archive

In north County Cork, Castlepook Cave near Doneraile offers the chief faunal counterpart to Derryvree's wetland sequence. This maze-like limestone cave system was excavated chiefly in the early twentieth century and has produced more than 2,000 bones. It is Ireland's richest known archive for vertebrate life leading up to the Last Glacial Maximum. The wider dated assemblage spans a very long period, approximately 45,700 to 19,950 years BP, and should not be treated as a single simultaneous animal community.

Nevertheless, it demonstrates that during portions of the pre-maximum Ice Age Ireland supported, or was accessible to, a striking range of mammals. The cave's fauna includes woolly mammoth, giant deer (*Megaloceros giganteus*), reindeer, brown bear and spotted hyaena, while later cold-stage material

includes Arctic fox, wolf, collared lemming and Norwegian lemming. “Irish elk” is a traditional name for giant deer, but the species was neither confined to Ireland nor closely related to the living animals called elk in North America. Its fossils are significant for Ireland’s natural history, not proof of an ancient Irish national animal.

Castlepook also demonstrates why cave evidence demands care. Caves can be dens, traps, water channels and sediment repositories, not simply places where people lived. Spotted hyaenas and other carnivores could drag carcass parts underground; teeth, trampling, water movement, sediment pressure, excavation and later handling can all alter bones. The presence of mammoth or reindeer remains shows that these animals reached the wider region during the long interval represented by the deposit. It does not establish that every listed species grazed together outside the cave in 31,687 BCE.

The Fragile Human Clue

A reindeer femur from Castlepook has made this period especially important. Re-examined within the National Museum of Ireland collections, it has been reported as bearing a deep modification interpreted by zooarchaeologist Ruth Carden as a cut or chop made with a sharp stone tool while a fresh carcass was being processed. Public heritage accounts have associated the bone with an approximate age of 33,000 years ago, or around 31,000 BCE in broad calendar notation. If the modification is confirmed as human-made and reliably related to the age of the animal, it would indicate a remarkably early Upper Palaeolithic human episode in Ireland.

That conditional wording is essential. The femur came from an old cave collection, rather than from a modern excavation of an undisturbed occupation floor containing tools, hearths and food debris in recorded relationship to one another. The date would concern the reindeer’s death, not necessarily the exact time, place or agent of any later marking. One bone cannot reveal whether people killed the animal, found a carcass, removed meat, opened the limb for marrow, collected hide or sinew, or processed it elsewhere before carnivores or natural processes carried the bone into the cave.

No securely associated Irish stone-tool assemblage, dwelling, hearth, burial, human skeleton, art panel or repeated settlement layer of this age has yet been published. Renewed fieldwork at Castlepook has sought intact deposits, further modified bone, lithics, sediment evidence and ancient DNA precisely because such material could test the claim. The marked femur is therefore a potentially transformative clue, not proof of a permanent Palaeolithic population.

Society Beyond Recovery

For this broad period, there is no evidential basis for describing an Irish polity, ruler, war, alliance, diplomatic exchange, language, religion or formal learning. There are no known villages, cultivated fields, monuments, graves or trade goods from Ireland that can be assigned around 33.6 thousand cal BP. Terms such as “tribe”, “chief”, “nation” and “Irish people” would impose much later political and cultural categories upon a record that cannot sustain them.

If people did reach the island, comparison with Upper Palaeolithic societies elsewhere in north-west Europe makes small, highly mobile foraging groups a reasonable inference. Such visitors would have needed close practical knowledge of cold-weather shelter, stone raw materials, animal behaviour, fuel and seasonal routes. But those are expectations drawn from better-preserved European evidence, not

observations of an excavated Irish camp. There is no Irish evidence from this time for ritual practice, storytelling, ornament, music or teaching, and silence in the record must not be mistaken for proof that such capacities did not exist.

Nor can economy be reconstructed as trade in any meaningful sense. Reindeer, mammoth and giant deer point to animal movement and ecological connectivity with neighbouring lands, but animal dispersal is not commerce. Any human crossing to Ireland, if it occurred, would raise questions about routes and watercraft, yet there is no surviving boat, harbour, landing site or imported object from this horizon. The dependable historical picture is environmental: an intermittently habitable cold-stage landscape, populated by animals and perhaps touched by rare human visitors.

What This Year Can Mean

The central development around this notional date was not a battle, reign or foundation. It was Ireland's exposure to profound climatic transformation before the Last Glacial Maximum. At Derryvree, freshwater sediments preserve a window onto tundra wetland during an ice-free interval. At Castlepook, bones preserve the evidence of a richer Ice Age fauna than later Ireland possessed, together with one intriguing possible trace of human animal-processing. These archives are powerful precisely because they are small, damaged and difficult to interpret.

For 31,687 BCE, modern calendar-year precision is unavailable. The most responsible conclusion is neither that Ireland was a settled human homeland nor that it was wholly lifeless beneath permanent ice. It was a variable Ice Age country in which cold-adapted ecosystems existed in at least some regions; glaciers were advancing within the broader North Atlantic world; and the possibility of a brief human encounter remains open, compelling and unproven. Future excavation, refined radiocarbon dating and analysis of surviving cave sediments may alter that balance of evidence. For now, Fermanagh's frost mosses and Cork's cave bones set the limits of the story.

Chapter 015 of 100

31686 BCE

Derryvree's Hidden Silt^[15]



The label 31,686 BCE is a modern way of locating a point deep in prehistory, not a year that anyone then named, recorded or experienced in a calendar. In radiocarbon terms it corresponds broadly to about 33,636 years before AD 1950, but that apparent precision is misleading. No Irish deposit can presently be assigned securely to this individual year. The responsible approach is to place it within wider calibrated ranges and to ask what those ranges reveal. Around this point Ireland lay in the later part of Marine Isotope Stage 3, a fluctuating cold phase of the Late Pleistocene, several millennia before the Last Glacial Maximum overwhelmed much of the island.

A Date Inside Broad Ranges

The most useful Irish environmental sequence for this broad interval is at Derryvree near Maguiresbridge, County Fermanagh. Roadworks exposed freshwater silts and sands sealed between two layers of glacial till: evidence first of ice, then of a period in which water and sediments accumulated in an ice-free or locally ice-marginal landscape, and finally of renewed glaciation. Organic material from the freshwater beds returned a radiocarbon age of about 30,500 radiocarbon years before present. Calibration gives a much wider calendar range, approximately 36,900–31,700 calibrated years BP. The modern label 31,686 BCE falls within that span, but close enough neither to its beginning nor end to justify treating Derryvree as a snapshot of one year.

The sequence nevertheless establishes an important point. At some time during later MIS 3, northern Ireland contained a freshwater, periglacial environment before a subsequent ice advance buried it. Pollen, plant macrofossils and sediment character indicate a largely treeless landscape, often described as muskeg or wet tundra: saturated ground with sedges, mosses and cold-adapted plants, broken by pools and

sluggish watercourses. This was not the familiar green, wooded Ireland of later millennia. Nor should evidence from one Fermanagh basin be converted into a uniform island-wide weather report. It is a local archive, although one with major significance for understanding regional conditions.

Cold Ground, Living Water

At this date Ireland was not yet simply an island entombed beneath the maximum extent of the last ice sheet. Climate and ice limits shifted repeatedly over long timescales. The later Last Glacial Maximum is generally placed at about 26,500–19,000 years ago globally, while the British–Irish Ice Sheet had its own changing margins, flow patterns and local timings. Around the period represented at Derryvree, cold conditions, exposed ground, seasonal freeze-thaw and expanding ice were fundamental facts of life, but they did not eliminate every wetland, cave refuge or animal corridor. The order of the Derryvree deposits itself records this instability: ice, freshwater deposition, then ice again.

Such an environment would have been highly seasonal. Open ground could support herbaceous vegetation during the short growing season, while winter frost affected soils, drainage and movement. The evidence does not permit estimates of a precise temperature for 31,686 BCE, nor does it show whether every valley was equally harsh. It does show that Ireland's Pleistocene environments repeatedly altered as climate oscillated. Rivers and shallow pools could be productive places for plants, insects, birds and mammals, even amid extensive cold-steppe or tundra vegetation. These ecological patches mattered because they helped sustain animal populations at Europe's north-western edge.

The Castlepook Fauna

In north County Cork, Castlepook Cave near Doneraile provides the other essential Irish line of evidence. Excavations beginning in the early twentieth century recovered a remarkable quantity of animal bone from its passages and chambers. Later reappraisal and radiocarbon dating have shown that at least part of the assemblage belongs to MIS 3, broadly before the Last Glacial Maximum. Its fauna includes reindeer, brown bear, arctic fox, hare, spotted hyaena, giant deer and woolly mammoth. Not every specimen belongs to the same moment, and the cave's deposits were disturbed by both ancient processes and older excavation. Yet together they demonstrate that Ireland periodically supported, or was reached by, a far richer large-mammal fauna than survives in its later prehistoric record.

For a date around 31,686 BCE, Castlepook should therefore be understood first as a faunal and palaeoenvironmental archive. Reindeer suggest open, cold-country grazing habitat. Hyaenas, where their remains genuinely represent occupation or denning rather than material moved by other agencies, point to a carnivore community capable of exploiting large carcasses. Mammoth and giant deer bones indicate the presence of animals associated with extensive, open Pleistocene landscapes. Cave bones do not automatically reveal a harmonious local herd living beside the entrance. They may represent animals dying at different times, remains dragged in by carnivores, natural deaths, water movement or material reworked within the cave system.

This qualification matters especially because older cave excavations commonly removed deposits before modern stratigraphic recording, sieving and dating methods existed. The original Castlepook investigations were invaluable in preserving finds, many now associated with the National Museum of Ireland, but they did not leave the kind of intact sequence archaeologists would now seek. Recent licensed work at Castlepook has attempted to identify surviving undisturbed deposits and to improve the

chronology. New dates and new sediment studies may therefore alter the story. The strongest conclusion at present is not that every listed animal shared a single landscape, but that late-Pleistocene Ireland had episodic ecological connections sufficient for a varied fauna to occur.

The Human Question

Human presence at this early date remains a question rather than an established narrative. A reindeer femur from Castlepook has been interpreted as bearing a deep modification made on fresh bone with a stone edge, possibly during carcass processing. If that interpretation is confirmed, and if the modification is securely contemporary with the animal's death, it would be evidence that Upper Palaeolithic people reached Ireland around this broad period. It would be an important extension of Ireland's human story. It is not, however, evidence for a permanent settlement, a resident population, a named people or a continuous occupation of the island.

The distinction is crucial. There is no securely dated house, hearth, lithic workshop, human burial, food refuse deposit or substantial tool assemblage in Ireland that can be assigned to around 31,686 BCE. The more firmly published evidence for a human visit is much later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave in County Clare, directly dated to calibrated ranges of about 12,810–12,590 and 12,730–12,685 cal BP. That find shows how a single modified bone can provide meaningful evidence of an encounter, while still leaving much unknown about duration, group size and wider settlement.

Accordingly, no political affairs, diplomacy or warfare can responsibly be narrated for Ireland at this date. There were no written polities, rulers, borders or institutions known to the evidence. Nor can archaeology identify a religion, language, artistic tradition or system of formal learning in Ireland from this point. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone technologies, ornaments and cave art, but it would be unsound to transfer those practices automatically across the Irish Sea. A possible cut-marked bone could indicate the practical use of a sharp stone tool; it cannot establish an Irish cultural tradition.

Mobility Without a Map

If people did reach the island during MIS 3, their presence was probably brief and mobile. A party capable of reaching a cold, sparsely wooded western landscape would have required knowledge of animals, weather, clothing, fire and stone-working. But this is an inference from the logistical demands of Upper Palaeolithic life elsewhere, not direct evidence for a camp at Castlepook. The landscape itself was different: lower sea levels altered coastlines and the configuration of surrounding shelves, while glacial advances and retreats repeatedly changed possible routes. Faunal evidence indicates connection with wider north-west European ecosystems, but it cannot specify whether animals or people moved over exposed land, across seasonal ice, by short water crossings, or through changing combinations of these routes.

Nor is there evidence for trade in the ordinary historical sense. A visitor who butchered a reindeer, if that is what the Castlepook mark represents, would have pursued immediate subsistence: meat, fat, hide, sinew and perhaps bone. Such resources are plausible products of a carcass, not recovered commodities. We cannot identify exchange networks, camps linked by regular travel, or social territories. The cave record speaks far more clearly of animal life and depositional processes than of human economy.

What This Year Can Mean

The lasting importance of 31,686 BCE lies not in an invented event but in Ireland's position at a climatic threshold. Derrynree preserves the signature of cold freshwater wetlands between glacial episodes. Castlepook preserves the bones of animals that make later Ireland seem biologically impoverished by comparison. Together they show a changing Pleistocene country in which ice, water, open vegetation and mobile fauna continually reshaped the possibilities for life.

For Ireland, this is an age of evidence fragments rather than biography. The securely observable facts are sediments, pollen, plant remains, bones, cave contexts and radiocarbon ranges. Interpretations—whether a specific bone was cut by a person, how animals reached the region, or how habitable particular seasons were—must remain visibly provisional. That restraint is not a failure of history. It is the appropriate way to recover the deep past: allowing Derrynree's hidden silt and Castlepook's bones to tell us what they can, without making them claim more than they preserve.

Chapter 016 of 100

31685 BCE

Derryvree's Greenland Six^[16]



The label 31,685 BCE is a modern chronological convenience, not a year that can be recovered from Ireland's prehistoric record. There were no calendars, written accounts, named communities or annual environmental measurements on the island from which a discrete event could be dated. Converted to the archaeological convention of years before 1950, it falls at roughly 33,634 calibrated years before present (cal BP). That calculation is useful for orientation, but it must not create false precision. The responsible subject is a broad interval in the later Pleistocene, reconstructed from deposits, fossils, landforms and scientific dates that commonly carry uncertainties of centuries or millennia.

This notional year lies within Marine Isotope Stage 3, an unstable part of the last Ice Age. In the Greenland ice-core chronology it falls near the opening of Greenland Interstadial 6, conventionally dated at about 33.69–33.31 thousand years before present. That distant climatic sequence is a valuable framework, not a weather report for Ireland. Conditions in Ireland were shaped by Atlantic circulation, local relief, snow cover and the changing disposition of ice. The best Irish evidence near this horizon comes not from a camp or settlement but from a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh, and from cave-bone assemblages in the south.

A Date Range, Not a Dated Event

Radiocarbon results are not calendar dates read directly from bone, peat or wood. Carbon-14 concentrations in the atmosphere changed through time, so laboratory measurements must be calibrated against independently dated records. At more than 30,000 years ago the resulting calendar ranges are wide. Stratigraphy matters equally: a bone can be moved by water, scavengers or excavation; organic

sediment can be reworked; and a cave can preserve material accumulated in many separate episodes. Accordingly, a scientifically honest account of 31,685 BCE should use ranges and relative sequences rather than attach a hunt, migration or climatic episode to one imagined year.

Derryvree supplies the clearest local window. There, organic-rich silts lie between two glacial tills. The order of deposits establishes an important sequence: an earlier advance of ice, a period in which an ice-free freshwater or wetland environment developed, and a later return of glacier ice. A conventional radiocarbon result of $30,500 \pm 1,200$ radiocarbon years BP from the organic horizon has been calibrated broadly to approximately 36,900–31,700 cal BP. The nominal year considered here falls inside that wide interval. It does not identify the beginning or end of the wetland, still less a particular season in its history.

Water Beneath the Drumlins

The biological remains in the Derryvree silts indicate an open, treeless, cold-stage setting rather than the familiar wooded Ireland of later millennia. Pollen, plant macrofossils and insects point to grasses, sedges, herbs, juniper and moss-rich vegetation, with wet ground and open pools. Finds cited from the deposit include bogbean and mountain avens, plants well suited to cool conditions. The insect evidence has been interpreted as a muskeg-like wetland: water, decaying plant material and mosses set within an exposed landscape. “Muskeg” should not be imagined as a modern Canadian scene transplanted whole to Fermanagh; it is a shorthand for the combination of wet, peaty ground and open pools inferred from the evidence.

This was therefore neither a timeless frozen desert nor a settled pastoral countryside. The landscape probably changed rapidly over generations as temperature, precipitation, vegetation cover and seasonal meltwater varied. A wet basin could sustain aquatic plants and insects while the surrounding ground remained largely without trees. The later tills that sealed Derryvree are themselves part of the lesson: this local environment did not endure. Ice-sheet growth eventually remade or buried many Irish landscapes, destroying and concealing much of the evidence that might otherwise have survived from the Palaeolithic.

Ice Building, But Not Yet at Its Maximum

At about 33.6 thousand cal BP, Ireland was approaching, rather than living through, the Last Glacial Maximum. Modern reconstructions place the greatest overall extent and volume of the British–Irish Ice Sheet later, principally around 26,500–19,000 years ago, with maximum ice volume near 23 ka. The island was not simply all ice or all open ground at the earlier date. Geological evidence and modelling suggest growing ice centres in northern and upland Ireland, while dated sub-till organic deposits show that parts of north-central Ireland retained ice-free ground until at least around 34 ka. The margins, thickness and timing of individual ice bodies remain reconstructed estimates rather than lines that can be drawn with certainty on a map for one year.

Sea level was substantially lower than today because large quantities of water were stored in global ice sheets. Coastlines and shallow seas consequently differed from modern ones, but the precise accessibility of Ireland changed through time and is not a licence to invent a simple, permanent land bridge. What can safely be said is that animal movement into Ireland occurred during suitable intervals, and that lower sea levels altered the geography through which such movement took place. The later expansion of ice across much of the island was a decisive regional development: it reshaped terrain, displaced habitats and greatly reduced the chances that fragile traces of earlier people would survive.

Castlepook's Animal Archive

Castlepook Cave, near Doneraile in north County Cork, offers a complementary but very different record. It is Ireland's richest known cave archive for Pleistocene vertebrates. Its wider assemblage includes woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These species should not be assembled into a single illustrated scene for 31,685 BCE. The cave accumulated remains across a long span, individual specimens have differing ages, and some species may belong to separate environmental phases. Nevertheless, the assemblage establishes that Ireland could at various times before the glacial maximum support, or be reached by, a striking range of cold-stage mammals.

Spotted hyaena is especially significant, and especially cautionary. This was not evidence of a warm African-style landscape. Pleistocene spotted hyaenas ranged far beyond their present distribution and occupied open European environments. Hyaenas, wolves and other carnivores could drag carcass parts into caves, gnaw bones, scatter them and leave accumulations that later water and sediment disturbed. A cave bone is thus not automatically refuse from a human meal, and a break or groove is not automatically a tool mark. The Castlepook evidence illuminates food webs, animal dispersal and taphonomic processes before it can illuminate human society.

The Reindeer Question

A single reindeer femur from the historic Castlepook collection has made this period unusually important for Irish archaeology. It has been publicly reported as about 33,000 years old and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as having been made with a sharp stone tool while fresh bone was processed. County Cork heritage material presents the find as possible evidence that Upper Palaeolithic hunters handled reindeer in Ireland around 31,000 BCE. If the age, mark and relationship between them are confirmed through continued specialist assessment, the specimen would point to a human visit far earlier than Ireland's long-established post-glacial archaeological record.

Its potential importance does not remove its limits. The femur derives from an old cave collection, not from a newly excavated, securely stratified occupation floor. It has no securely associated hearth, dwelling, lithic assemblage, human remains, burial or repeated food-processing deposit of comparable age. The date primarily concerns the animal bone; it cannot by itself establish the exact moment of marking, where the reindeer was killed, or how long people were present. The National Museum of Ireland still states that clear evidence of Palaeolithic human presence has not emerged. The difference between that institutional caution and the exciting Castlepook interpretation is not a problem to conceal: it is the present state of the evidence.

What Cannot Be Recovered

There is no basis for political history in Ireland at this date. No state, kingship, chiefdom, named people, diplomacy, treaty, organised warfare or legal institution can be identified. Nor can archaeology demonstrate an Irish language, a religion, formal learning, monument building, art tradition, long-distance trade network or permanent settlement around 31,685 BCE. If small groups of *Homo sapiens* did reach the island, they may have been highly mobile hunter-gatherers exploiting seasonal opportunities, as people elsewhere in Upper Palaeolithic Europe did. But that is a contextual possibility, not a demonstrated Castlepook culture or a continuous population ancestral to later inhabitants.

Everyday life is similarly elusive. The Derryvree deposits show environmental conditions, not households. The cave fauna shows animal presence and carcass accumulation, not a diet list for a resident community. The possible reindeer cut mark is evidence for one act of carcass processing only if its human interpretation holds. It cannot establish whether people hunted the animal, scavenged it, travelled with families, used a cave as shelter, or departed after a short visit. The later glaciation that crossed and remodelled much of Ireland helps explain why the evidence is so sparse, but erosion cannot be used to fill the silence with imaginary camps.

The most important development around this notional year was environmental. Ireland contained cold, open and locally wet habitats during an interval before the full expansion of the last ice sheet. Derryvree preserves a rare record of those conditions beneath later glacier deposits; Castlepook preserves an equally rare record of Ice Age animals, and perhaps a tantalising trace of people. Together they show that Ireland's deep past was not empty, but also that it is fragmentary. Around 31,685 BCE, evidence supports an ice-age landscape in transition and a rich, changing animal world. It does not support a year-specific human story.

Chapter 017 of 100

31684 BCE

Derryvree's Marsh Ledger^[17]



Modern calendar-year precision is not available for Ireland in 31,684 BCE. The number is a useful point of orientation, not a date at which an identifiable Irish event occurred. In radiocarbon and ice-core terms it falls about 33.6 thousand years before AD 1950, within the Late Pleistocene and broadly within Marine Isotope Stage 3, a long, unstable portion of the last Ice Age. Dates this old carry substantial analytical uncertainty: calibrated ranges, stratigraphic relationships and comparison with wider north-west European records are more responsible guides than an asserted day, season or even single year.

A Landscape Between Ice Advances

The best Irish evidence nearest this horizon comes not from a settlement but from sediments. At Derryvree, near Maguiresbridge in County Fermanagh, road works exposed organic silts and fine sands enclosed between two distinct sheets of glacial till. The lower till shows that ice had previously crossed the district; the upper till records a later advance. Between them lies evidence for a period when water, plants and animals occupied an ice-free local landscape. A conventional radiocarbon determination of 30,500 years BP from the organic sequence has been calibrated broadly to roughly 36,900–31,700 calibrated years BP. Thus 31,684 BCE sits at the younger end of that wide range, but cannot be tied securely to one layer, one season or one human visit.

This is why the Derryvree sequence matters. Ireland's Pleistocene archive is fragmentary. Later glaciers repeatedly eroded, redeposited and buried older ground surfaces, while rising seas after the Ice Age drowned large areas of the former coastal plain. A deposit protected beneath till can preserve a rare interval otherwise removed from the landscape. It offers a local environmental record, not a complete map

of Ireland, and still less a narrative of a community. Yet it establishes an important point: portions of northern Ireland were capable of supporting freshwater habitats during a cold phase before the last major ice-sheet expansion.

Marsh, Pools and Open Ground

Pollen, plant macrofossils and insects from Derryvree indicate a treeless or nearly treeless environment. Grasses, sedges, juniper and cold-tolerant herbs were among the important elements identified, while mosses and aquatic plants point to saturated ground and standing or slow-moving freshwater. The old term *muskeg* is useful here if used carefully: it evokes a wet, mossy, peaty landscape with pools and sedge-rich margins, rather than a uniform blanket bog of the kind familiar in later Ireland. The terrain around the water would have included exposed mineral soils, patches of short vegetation and seasonally difficult ground.

Such evidence supports a picture of open tundra-steppe or marshy tundra in this part of Fermanagh, with cold winters and a brief productive growing season. It does not demonstrate a fixed climate for every part of the island. The island's relief, Atlantic position, snowfall and proximity to ice would all have produced local variation. Nor should an interval without trees be mistaken for a lifeless one. Low vegetation could sustain insects, small mammals and grazing animals; wet places concentrated food and water. In an otherwise severe world, a marsh-edge may have been one of the more biologically varied places in the landscape.

Other northern sites broaden the perspective. Organic deposits at Hollymount, also near Maguiresbridge, and at Greenagho near Belcoo in County Fermanagh preserve evidence of non-glacial conditions within the Midlandian cold stage. At Aghnadarragh near Lough Neagh in County Antrim, a remarkable sequence of tills, freshwater sediments and organic deposits records repeated environmental change over the last glacial cycle. Its older deposits include evidence for woodland in a milder interstadial, while other units contain woolly mammoth and musk ox. These places should not be compressed into one synchronous Irish landscape: their dates and environments differ. Together, however, they show that Ireland's Ice-Age history was a sequence of advances, retreats and ecological reorganisations, not an uninterrupted white emptiness.

Castlepook and the Animal World

For the fauna of this broad period, Castlepook Cave near Doneraile in north County Cork is indispensable. Excavations and later reassessment of its collections have identified remains including woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, stoat, mountain hare and lemmings, as well as spotted hyaena. Radiocarbon programmes have shown that the cave's faunal record is complex and that older dates require careful treatment. Even so, the assemblage demonstrates that parts of Ireland supported a striking mixture of cold-adapted grazers, predators and scavengers during Marine Isotope Stage 3.

The cave should not be imagined as a tranquil museum of animals living side by side at a single instant. Cave deposits accumulate over long periods; bones may be moved by carnivores, water, excavation or collapse. Spotted hyaenas are especially significant because they carried carcass parts into dens, altering what survives and where it lies. Tooth marks on mammoth bone are evidence of carnivore

activity, not human hunting. Similarly, the presence of reindeer bone establishes reindeer in Ireland, but cannot on its own reconstruct herd size, migration routes or the exact appearance of the Doneraile countryside in this particular numbered year.

Nevertheless, the animal evidence makes ecological sense beside the Fermanagh sediments. Reindeer are well suited to open, cold terrain; lemmings and Arctic fox likewise signal northern conditions. Mammoths and giant deer imply substantial forage in at least some seasons. Predators and scavengers followed this productivity. Ireland was not yet the familiar wooded island of later prehistory. It was part of a wider, fluctuating north-west European world in which open ground and low sea levels could make movement between regions easier than it would later become, although the exact routes and timing of connections between Ireland, Britain and the Continent remain debated.

The Human Question

There is one potentially momentous human clue. A reindeer femur from Castlepook, recovered during early twentieth-century excavations associated with the naturalist Richard J. Ussher, bears a deep incision interpreted by Ruth Carden as a cut made with a sharp stone tool during butchery. County Cork heritage material dates the bone to about 31,000 BCE and presents it as evidence that Palaeolithic people reached Ireland far earlier than was once accepted. If that interpretation is sustained, it makes Castlepook the earliest known indication of human activity on the island.

But the scale of the claim must match the scale of the evidence. The cut-marked bone does not reveal a village, a permanent population, a language, a named people or a political territory. No securely associated stone-tool assemblage, hearth, dwelling floor, burial ground or art has yet been recovered at Castlepook. The bone also appears to have entered a cave system used by carnivores, so it does not prove that people lived in the cave or killed the animal there. At most, it supports the possibility—indeed, on the published interpretation, the likelihood—that one or more people processed a reindeer in Ireland during this general period.

That distinction is historically important. A short hunting or scavenging visit by mobile hunter-gatherers is very different from continuous settlement. The visitors may have followed animals, crossed during a phase of lower sea level, stayed briefly and left little durable material behind. Their tools would probably have been of stone, wood, bone and hide, but no particular tool type can responsibly be assigned to Ireland from this single bone. Comparisons with Upper Palaeolithic societies in Britain and continental Europe can suggest possibilities—small mobile groups, sophisticated knowledge of animal behaviour, use of hides, meat, marrow and sinew—but they are comparisons, not direct Irish evidence.

No Politics, but a Real Social World

There is no evidence from Ireland around this horizon for rulers, tribes, diplomacy, organised warfare, religious monuments, formal trade networks or institutions of learning. To describe political affairs would be to invent them. Nor can archaeology yet identify ceremonies or beliefs from the Derryvree sediments and Castlepook bones. The absence of such evidence does not mean that any people present lacked social relationships, practical knowledge or cultural traditions; rather, their traces have not survived in forms that allow those things to be described.

What can be said is more modest and more compelling. Survival in a cold, changeable environment required social cooperation if people were present: sharing food, making and maintaining cutting implements, reading weather and animal movements, and transmitting knowledge of routes and safe

places. Animal carcasses offered meat, fat, marrow, hide, sinew and bone. Yet Ireland supplies no direct evidence that these resources were systematically exchanged, stored or traded at this date. The most secure economy is the non-human one visible in the deposits: grazing animals converting sparse vegetation into biomass, carnivores and hyaenas exploiting carcasses, and wetland plants growing wherever water and summer warmth allowed.

Approaching a Colder Future

The wider climatic setting was unstable. Greenland ice-core and Atlantic marine records reveal repeated abrupt swings between colder stadials and relatively milder interstadials during Marine Isotope Stage 3. Correlations from an Irish deposit to an individual Greenland event are necessarily tentative, because the dates are broad and local responses vary. Still, Derrynvree belongs to a period in which climate could change sharply on timescales meaningful to animal populations and human travellers. A landscape capable of supporting marsh and grazing herds could later be overridden or transformed by ice.

By the Last Glacial Maximum, after about 26,000 calibrated years BP, much of Ireland lay beneath the expanding British–Irish Ice Sheet. Modern reconstructions indicate that major growth and maximum extent came later than the Derrynvree freshwater interval, though ice may already have been accumulating on northern high ground by around 31,000 years BP. The future ice would scour and bury evidence, helping to explain why the Irish Palaeolithic record is so slight. Around 31,684 BCE, then, the responsible history is neither a story of empty land nor a story of a settled nation. It is a narrow but powerful record of cold wetlands, open-country animals, possible human butchery and a landscape poised within the long advance of the Ice Age.

Chapter 018 of 100

31683 BCE

Derryvree's Inter-Till Flora^[18]



Modern calendar-year precision is not available for Ireland in 31,683 BCE. The label is a retrospective convenience, roughly 33.6 thousand years before the conventional radiocarbon reference year of AD 1950, rather than a date that people could have recognised or recorded. No Irish deposit can be assigned responsibly to that particular twelve-month interval. The appropriate setting is the later part of the Pleistocene, broadly Marine Isotope Stage 3 (MIS 3), a climatically unstable stretch of the last Ice Age. For this time, Ireland's history is recovered from sediments, fossil plants, animal bones, cave deposits and ice-sheet reconstructions—not from chronicles, settlements with known inhabitants or datable political events.

A Date Range, Not a Dateline

The closest environmental evidence comes from deposits whose ages overlap this notional year. At Derryvree near Maguiresbridge in County Fermanagh, roadworks in 1969 cut through a drumlin and revealed freshwater silts and fine sands trapped between two sheets of glacial till. The organic deposit produced a conventional radiocarbon determination of 30,500 years before present, with a substantial error range. When expressed in calibrated terms, the evidence is commonly placed broadly between about 36,900 and 31,700 calibrated years before present. That is a span of millennia, but it securely makes Derryvree one of the most important Irish windows onto the cold landscape relevant to 31,683 BCE.

Such caution matters. Radiocarbon ages are not calendar ages: atmospheric carbon-14 has varied through time, and calibration is especially difficult at this depth in the record. Deposits may also form intermittently, be reworked by water, or be sealed beneath later ice. A radiocarbon result dates the sampled

organic matter, not every plant, animal or incident represented in a layer. The evidence can therefore illuminate conditions in parts of Ireland during a broad interval; it cannot supply a weather report, population total or event for one named year.

Cold Water Under Ice

Derryvree shows that at least part of Fermanagh contained a freshwater environment between glacial episodes. Its pollen, plant macrofossils and insect remains point to open tundra and periglacial conditions: ground affected by freezing and thawing, wet hollows, exposed mineral soil, shallow water and sparse vegetation rather than dense woodland. Mosses and herbaceous plants dominate the record. Finds include dwarf willow, sedges and bogbean, a plant of wet ground and shallow water. The resulting landscape was not necessarily an unbroken white wilderness. It was a seasonal mosaic in which wet basins and streams could sit among open, windswept ground.

The flora also establishes limits on interpretation. Occasional pollen grains from trees such as pine or hazel do not demonstrate a local forest. They may have travelled long distances or entered deposits in other ways. The defensible conclusion is that woodland, if present nearby at all, was not the dominant landscape recorded at Derryvree. Cold-adapted plants and mosses indicate a difficult environment in which growing seasons were short, shelter limited and ecological productivity highly seasonal.

Derryvree was not a representative sample of the entire island. Ireland's topography, proximity to the Atlantic, elevation and changing ice margins would have produced regional variation. The sediments nevertheless disprove any simple picture in which the island was either wholly smothered by permanent ice or uniformly habitable grassland. They preserve an ice-free freshwater refuge at one point within an evolving glacial landscape, later entombed by ice and reshaped into a drumlin.

Castlepook's Animal World

The complementary archive lies far to the south at Castlepook Cave near Doneraile in north County Cork. This limestone cave system has yielded more than 2,000 bones and is Ireland's richest known archive of vertebrate life leading up to the Last Glacial Maximum. Its material accumulated over a long interval, not in one occupation layer. Improved radiocarbon pretreatment has shown that several older dates obtained from the cave and neighbouring southern Irish caves were too young, sometimes by thousands of radiocarbon years. The revised evidence places important animal remains within MIS 3 and stresses why old collections need continual re-examination.

Animals represented at Castlepook include reindeer, giant deer, woolly mammoth, brown bear and spotted hyaena; later cold-stage material includes lemmings, Arctic fox and wolf. No single list should be treated as a census for 31,683 BCE, because individual bones have different ages and may have entered the cave through different processes. Even so, the assemblage supports a broad reconstruction of open, cold country capable of sustaining large grazing mammals and their predators or scavengers. Reindeer and lemmings suit tundra-like habitats; mammoths and giant deer imply extensive feeding grounds, though their precise local ranges remain uncertain.

Spotted hyaenas are especially important for understanding the cave. Their presence indicates that Castlepook was not simply a human shelter awaiting discovery. Carnivores could drag carcass parts into chambers, gnaw and scatter bones, while water, roof collapse and later disturbance could move material again. A cave bone is therefore evidence first of an animal and a depositional history. It becomes evidence of people only where modification and dating can withstand close taphonomic scrutiny.

The Reindeer Femur

One Castlepook reindeer femur gives this period unusual archaeological significance. The bone has been reported as dating to about 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as a cut or chop made by a sharp stone edge while the bone was fresh. If that interpretation and the association of mark and carcass are sustained, it would provide evidence of human activity in Ireland during the wider period represented by this article—far earlier than the island's formerly accepted terminal-Pleistocene evidence.

Its implications must be kept proportionate. A marked reindeer bone may record the processing of one carcass by one or more people. It does not demonstrate a village, permanent settlement, named cultural group, family lineage, language or continuous occupation. No securely associated hearth, dwelling, stone-tool assemblage, burial or midden of comparable age has been found at Castlepook. Nor is it certain that the animal was killed or butchered inside the cave; County Cork heritage interpretation reasonably notes that scavengers may have carried discarded remains into their lair.

The most cautious reading is thus one of possible, perhaps brief, human presence. Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe were skilled makers and users of stone, bone and antler equipment, and could move widely through demanding environments. That wider context makes a visit to Ireland conceivable. It does not license the transfer of continental cave art, ornaments, houses, ritual practices or particular tool traditions to Ireland without Irish finds. At present, the femur is a provocative clue rather than a complete archaeological horizon.

Society Without Names

There is no evidence from Ireland around this date for political institutions, chiefs, territories, diplomacy, warfare or organised religious sites. There are no human remains, written symbols or structures from which to reconstruct kinship, authority or belief. It would be misleading to fill the silence with imagined Ice-Age clans. If people did reach the island, their small-scale social world was likely organised around close cooperation in travel, food acquisition, shelter and the use of animal materials, but that is an inference drawn from hunter-gatherer lifeways elsewhere, not a direct observation of Irish society.

The same distinction applies to everyday life. Reindeer could have supplied meat, marrow, hide, sinew and bone to any people who processed them, yet Castlepook supplies no securely associated tool kit or camp debris to show how this work was done in Ireland. Mammal movement, carcass scavenging and cave use were probably as significant to the site's formation as human action. The strongest historical fact is not that Ireland possessed a settled Palaeolithic community, but that its landscapes and fauna offered opportunities that a mobile visitor might have exploited during favourable intervals.

Routes, Coasts and Isolation

Economy and trade are similarly beyond direct recovery. There is no local evidence for exchange networks, boats or regular crossings at this date. Yet Ireland was part of a wider north-west European environmental zone. Lower sea levels altered coastlines and exposed land now submerged around the island, while glaciers and sea ice repeatedly changed possible routes. The presence of a diverse mammal fauna shows that animals reached Ireland during parts of the Pleistocene, but it does not reveal one simple, permanent land bridge or a single route used by people.

For any human party, movement into Ireland would have been an undertaking shaped by weather, coastlines, animal corridors and ice conditions. A route may have involved exposed coastal plains, narrow sea passages, seasonal ice or some combination of these; the physical geography is still debated in detail. This uncertainty is central rather than inconvenient. The arrival of animals and, potentially, people depended on a changing regional landscape that later inundation and glacial erosion have largely removed.

Approaching the Great Freeze

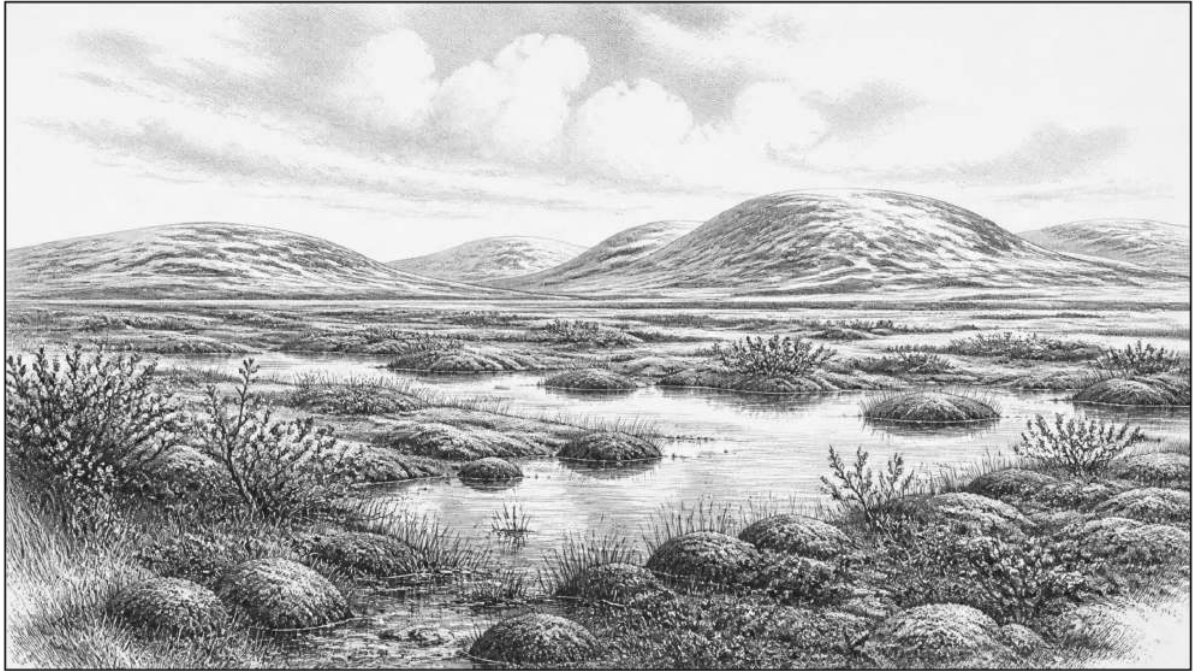
At roughly 33.6 thousand years before AD 1950, Ireland was moving towards the fuller expansion of the last British–Irish Ice Sheet, but it had not yet become the uniformly ice-dominated landscape of the Last Glacial Maximum. Ice-sheet reconstructions indicate a dynamic, regionally asynchronous advance. Western Ireland records substantial ice-sheet influence before the maximum, while wider reconstructions place significant growth and changing margins around and after 31,000 years ago. The exact position of ice at any locality on the article’s nominal date cannot be fixed with confidence.

That uncertainty gives Derryvree its force. The freshwater silts beneath a later drumlin preserve a world that subsequent glaciation almost erased: mossy wet ground, sedges, shallow water and open tundra, existing within a landscape vulnerable to renewed ice advance. Castlepook preserves another fragment, a cave repository of large animals and carnivores from a long, changing cold stage. Together they offer the responsible history of Ireland around 31,683 BCE: not a year of rulers or battles, but an unstable ecological frontier, briefly capable of supporting a remarkable fauna and perhaps visited by people whose presence survives, if at all, in a single contested cut on reindeer bone.

Chapter 019 of 100

31682 BCE

Derryvree's Frostwater Flora^[19]



The label 31,682 BCE is a modern chronological convenience, not a year that anyone in Ireland could have named, recorded or commemorated. It corresponds approximately to 33,632 calendar years before 1950, the conventional reference point for *cal BP* dates. At this depth of time, calendar-year precision is not available. Radiocarbon determinations have sizeable uncertainties, must be calibrated, and date the death of an organism or formation of a deposit rather than an event in a historical narrative. Ireland therefore has no responsible “year-by-year” story for this point. What can be reconstructed is a broad environmental setting in the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the last Ice Age.

An Interval, Not a Chronicle

Modern Ireland did not yet exist as a political community, a cultural region with recorded traditions, or a settled landscape of farms, roads and monuments. There were no kingdoms, diplomatic agreements, battles, shrines, markets or written learning to describe. Nor is there evidence from this period for a securely established human population on the island. The historical record is geological and biological: sediments trapped beneath later ice, pollen grains, plant macrofossils, insect remains, cave bones, isotope measurements and the landforms left by glaciers.

The most useful Irish comparison for this nominal date 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, rich in organic material, lay between two distinct sheets of glacial till. Till is sediment deposited directly by moving ice. The sequence consequently shows three broad stages: ice

affected the locality; a freshwater environment and cold-adapted vegetation developed; and ice later returned or expanded across the ground. It is an unusually valuable survival from a landscape otherwise repeatedly eroded and rearranged by glaciation.

The organic layer at Derryvree produced a conventional radiocarbon determination of 30,500 years BP, with a substantial error margin. In calibrated terms, later scholarship has treated it as falling broadly within about 36,900–31,700 cal BP. The nominal date of 31,682 BCE lies close to the younger edge of that wide range, but this does not make Derryvree a deposit formed in that specific year. Rather, it offers the closest available Irish window onto the kind of cold-stage environment that may have existed around this point in time.

Mosses, Sedges and Shallow Water

Derryvree overturns any simple image of an entirely frozen, lifeless Ireland. Its pollen was poorly preserved, and cannot be used to draw a detailed island-wide vegetation map. Even so, herb pollen, freshwater mosses, sedges, aquatic plants and cold-climate insects point clearly towards open, treeless or almost treeless ground. Researchers described the setting as tundra and muskeg: wet, mossy, peat-forming terrain broken by pools, channels and patches of sedge-rich vegetation. Fossil evidence includes plants such as bogbean, dwarf willow and lesser clubmoss, species well suited to cool, exposed and often waterlogged conditions.

This was not the familiar green, wooded Ireland of the Holocene, nor necessarily a blank expanse of snow. In the growing season, shallow water and damp hollows could sustain mosses, herbs, insects and grasses. Local shelter, soil moisture, slope and drainage would have produced ecological variation at a small scale. Exposed ridges and frost-disturbed surfaces may have been sparse, while basin edges were more productive. Winters were severe, and the short season for plant growth imposed limits, but freshwater sediment could still accumulate and small wetland communities could thrive.

Evidence from Crag Cave near Castleisland, County Kerry, supports the larger point that late Ice Age conditions changed markedly rather than remaining uniformly frozen. Uranium-thorium dates show that speleothems, the calcite formations commonly called stalagmites and stalactites, grew episodically during MIS 3. Their formation requires water to circulate through the cave and is associated with intervals when mean annual conditions were sufficiently mild for liquid water. This does not prove that County Kerry and County Fermanagh had identical climates at the same moment. It does demonstrate that Ireland's long cold stage contained environmental fluctuations and locally habitable, biologically active intervals.

Ice in Motion

At approximately 33,600 cal BP, Ireland was approaching the major growth phase of the last British–Irish Ice Sheet, but the evidence does not support a single, simple picture of the entire island already buried beneath continuous ice. Reviews of the glacial record place the broad build-up of the ice sheet after roughly 35,000–32,000 years ago, while its greatest overall extent came later, during the Last Glacial Maximum, conventionally placed around 27,000–21,000 years ago. Different sectors advanced, thickened and retreated on different schedules. Ice divides, outlet glaciers, meltwater routes and surrounding seas all changed through time.

Derryvree is important precisely because it preserves an ice-free episode between two glacial events in north-central Ireland. Comparable inter-till or sub-till deposits at Hollymount and Greenagho, also in Fermanagh, show that this region retains fragments of a longer, complex sequence. These deposits do not

establish the precise position of every ice margin in 31,682 BCE. They do rule out an overly neat narrative in which Ireland was either wholly ice-covered or wholly ice-free throughout MIS 3. The island's physical geography was being made and remade by climate shifts over millennia.

Lower global sea levels exposed more of the continental shelf than is visible today, altering coastlines and potential dispersal routes for animals. Yet the exact palaeogeography between Ireland, Britain and continental Europe remains a matter for careful reconstruction, not assumption. It is unsafe to imagine an uncomplicated land bridge across which people and animals simply walked at any chosen date. Glaciers, water bodies, exposed lowlands and changing sea levels created different barriers and opportunities at different times. The routes by which animals reached Ireland remain part of the wider Quaternary problem.

The Cave Fauna of Cork

Southern Irish caves provide another line of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, yielded bones of a striking Pleistocene fauna during excavations in the early twentieth century. The assemblage includes spotted hyena, reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare and small cold-adapted mammals. These finds show that Ireland was, at various times during the later Pleistocene, part of a wider north-west European ecological zone in which large herbivores, predators and scavengers moved through open landscapes.

That statement needs an important qualification. A cave bone collection is not automatically a census of animals living together on one day or even in one century. Bones may have been brought into caves by hyenas, accumulated in separate episodes, shifted by water, disturbed by burrowing animals or mixed by antiquarian excavation. Direct dating has improved the picture, but individual specimens still have individual histories. Recent reassessment indicates that some of the older Castlepook fauna, including spotted hyena and giant deer, may belong earlier in MIS 3 and may have disappeared locally before the Last Glacial Maximum. The site reveals a changing faunal mosaic, not a fixed Ice Age menagerie.

At the broad timescale of 31,682 BCE, reindeer are especially significant. A reindeer femur from the old Castlepook collection has been reported as dating to around 33,000 years ago and bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as a cut or chopping mark made with a sharp stone tool on fresh bone. If that interpretation is confirmed, it would be potentially transformative: it would indicate that a person processed a reindeer in Ireland in the broad era considered here, far earlier than the previously secure evidence of terminal Pleistocene human activity.

The Human Question

The proper conclusion remains cautious. The radiocarbon result dates the animal bone, not automatically the mark, the animal's place of death, or the duration of any human visit. Identifying a surface modification as a stone-tool cut is a separate taphonomic judgement, particularly important in a cave where carnivore damage, weathering and old excavation methods complicate interpretation. No securely associated stone-tool assemblage, hearth, dwelling floor, human burial, artwork or repeated occupation layer of comparable age has yet been published from Castlepook.

It follows that there is no basis for describing a settlement, a permanent population, an ethnic community, a language or a social hierarchy in Ireland at this date. If people did reach the island, the marked femur could represent a brief episode: scavenging a carcass, butchering an animal killed

elsewhere, or a short hunting incursion within a much wider mobile world. It does not prove continuity between any such visitors and the island's much later inhabitants. Renewed excavation at Castlepook is valuable because stratified deposits may eventually test old claims against securely recorded contexts.

Consequently, politics, conflict, diplomacy, religion and formal culture are absent from the evidence—not because they can be confidently said never to have existed among possible visitors, but because Ireland has no material record capable of demonstrating them here. Nor can an economy or trade network be reconstructed. The only defensible economic observation is ecological: animals depended on seasonal forage and water, while any visiting people would have had to obtain food, fuel, shelter and workable stone in an unpredictable cold environment.

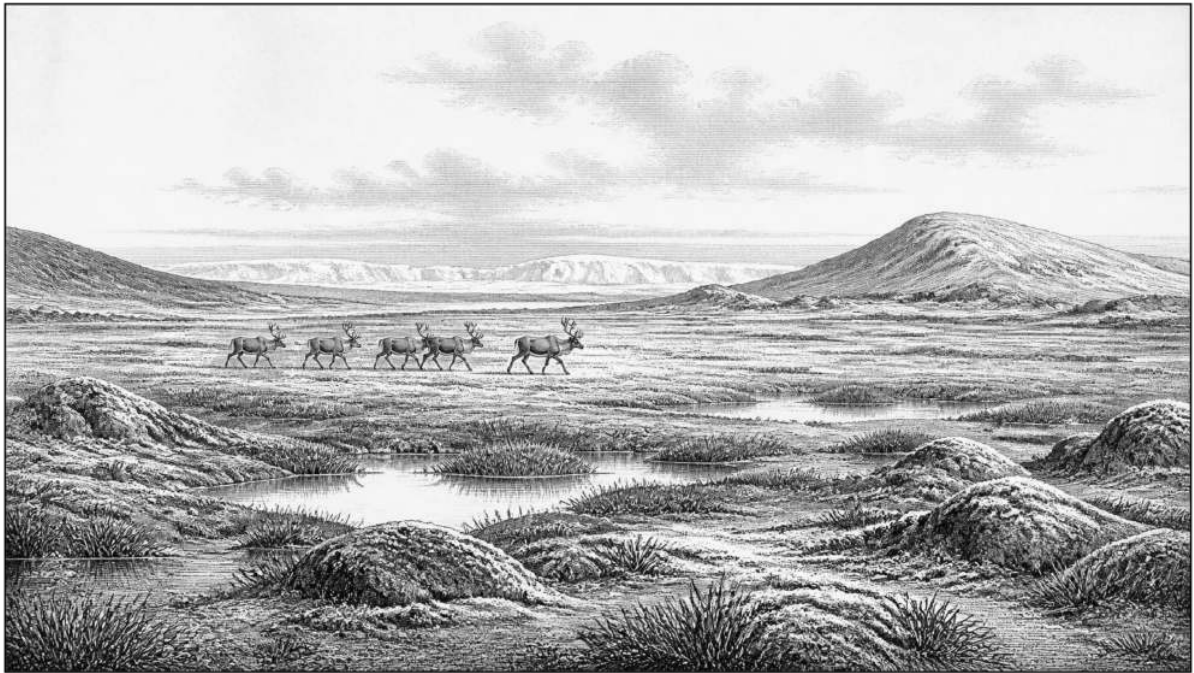
What This Date Can Mean

Ireland around 31,682 BCE is best understood as a changing Ice Age landscape on the threshold of more extensive glaciation. At Derryvree, freshwater, sedges, mosses and cold-adapted insects record an open periglacial wetland later sealed beneath ice. At Castlepook, cave bones attest to the intermittent presence of large mammals and carnivores within a wider Pleistocene ecosystem. One marked reindeer bone raises a serious but unresolved possibility of early human activity. Together, these traces replace invented certainty with something more compelling: an Ireland shaped by moving ice, unstable climate, short productive summers and rare archaeological survivals whose meanings are still being tested.

Chapter 020 of 100

31681 BCE

Derryvree's Tundra Waterline^[20]



“31,681 BCE” is a modern label, not a date that can be recovered from the Irish archaeological record as a particular year, season or generation. No calendar, written testimony, settlement sequence or securely dated human activity allows events in Ireland to be fixed so precisely at this depth of time. The useful chronological frame is broader: approximately 33,630 calendar years before AD 1950, during the Late Pleistocene and Marine Isotope Stage 3, a climatically unstable part of the last Ice Age. Radiocarbon measurements of this age must be calibrated and normally produce ranges spanning centuries or millennia, not a single historical date.

The most illuminating evidence for Ireland around this notional point lies not in monuments or artefacts, but in sediments, pollen, insects, plants and animal bones. It describes a changing physical world in which people may have made brief incursions, but for which a settled human population remains unproven. The central Irish environmental record is at Derryvree, near Maguiresbridge in County Fermanagh, while the strongest evidence for large mammals comes from limestone caves in the south, particularly Castlepook near Doneraile in County Cork.

A Date Range Beneath a Drumlin

In 1969 roadworks cut through a drumlin at Derryvree and exposed an extraordinary sequence: freshwater silts and fine sands, rich in organic material, lying between two thick layers of till. Till is sediment deposited directly by ice. The intervening beds therefore preserve an interval when a wetland existed in a landscape later overridden or enclosed by glacial deposits. Organic material from the freshwater series returned a conventional radiocarbon age of 30,500 +1,170/–1,030 years BP. Calibration places it within a broad late-MIS 3 range, approximately 36,900–31,700 cal BP. The modern label 31,681 BCE falls within that wide span, but cannot be tied to a particular layer, day or event.

This distinction is essential. Derryvree is evidence for conditions during a long environmental interval, not for a year-specific occurrence. Its fossil record points to open, treeless ground under a severe periglacial climate. Periglacial does not mean covered by glacier: it denotes a cold environment shaped by frost, frozen ground, seasonal thaw and sparse vegetation at or near the margins of ice. The fresh-water deposits show that pools, wet ground and sedge-rich margins could exist amid that harshness.

Plant remains, pollen, mosses and insects from Derryvree indicate a tundra-like mosaic rather than forest. Sedges, dwarf shrubs and cold-adapted wetland plants occupied waterlogged patches; exposed mineral ground and frost-disturbed surfaces probably lay nearby. The evidence is local, representing vegetation around the basin and material brought into it by water and wind. It does not justify a detailed map of the whole island. Yet it firmly corrects any image of Ireland as uniformly entombed beneath ice at every moment of the late Ice Age.

An Island Before the Maximum

At this stage the Last Glacial Maximum still lay ahead. Its most extensive phase in Britain and Ireland occurred later, broadly between about 30,000 and 22,000 years ago in different sectors, with maximum overall ice volume around 23,000 years ago. The build-up was neither simple nor uniform. Ice expanded and shifted between marine and upland sectors, while the location of margins remains more securely known for some later phases than for the earlier part of the glaciation.

Consequently, Ireland around 31,681 BCE should not be pictured either as wholly ice-free or as a single uninterrupted ice sheet. The best reconstruction is one of regional variation and rapid climatic change: substantial ice masses and cold-zone landscapes existed, but some places supported exposed land, freshwater and animals. Derryvree demonstrates such an environment in Fermanagh during its dated interval. Cave and fossil records in the south show that terrestrial mammals could reach and live in Ireland during MIS 3. Whether these places were connected at exactly the same time is often uncertain, because their deposits have different dating resolutions and formation histories.

Lower global sea levels made the outlines of north-west Europe very different from those of today. Ireland was not yet the small, fully isolated Atlantic island familiar on modern maps. Broad shelves were exposed, and changing land and sea corridors affected the movements of ice, animals and potentially people. Nevertheless, no simple land bridge should be assumed across every route or throughout the entire period. Coasts, channels, sea ice and ice-sheet margins altered repeatedly, and the practical accessibility of Ireland depended on conditions that could change over generations.

Castlepook's Animal Archive

Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, provides Ireland's richest known concentration of vertebrate remains from before and during the last cold stage. Its collections include woolly mammoth, giant deer, reindeer, brown bear, wolf, fox, Arctic fox, mountain hare, spotted hyaena and lemmings. This is a strikingly non-modern Irish fauna. It shows that, before later glaciation and post-glacial sea-level rise reshaped the island's ecology, Ireland could support animals now associated with continental or far northern environments.

The list must not be read as a roll call from one hunting ground. Cave deposits are complicated archives. Bones may have been carried in by carnivores, washed through passages, disturbed by later animals, moved by sediment or recovered in early excavations that did not meet modern recording standards. Castlepook was a place of accumulation over long periods, not a preserved snapshot of a single

community. Its species demonstrate ecological possibility and broad chronological presence; they do not prove that mammoth, hyaena, reindeer and giant deer stood together at one moment near the cave entrance.

Even so, the fauna strongly suggests open country capable of feeding large grazers and browsers, alongside carnivores able to exploit them. Reindeer were suited to seasonal, open landscapes; lemmings and Arctic fox point towards cold conditions; mammoth and giant deer imply substantial plant resources over a wider territory. Hyaenas could have hunted, scavenged and dragged carcass parts into caves. A cave full of bones therefore records animal behaviour as much as climate: predation, scavenging, denning, death and water movement all helped make the archive.

The Human Question

A reindeer femur from the Castlepook collection has been reported as approximately 33,000 years old and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during carcass processing. If the interpretation is confirmed, it would be potentially momentous: it would indicate Upper Palaeolithic people handling a reindeer in Ireland tens of millennia before the long-recognised post-glacial record of human occupation.

But the claim requires careful wording. The bone derives from an old cave collection, rather than a modern excavation of an intact occupation floor. A radiocarbon date establishes the approximate time at which the animal died; it does not independently date the incision, the kill site or the length of any human visit. Nor has Castlepook yielded a securely associated hearth, stone-tool assemblage, dwelling surface, burial or repeated domestic refuse of comparable age. The identification of a cut or chop mark is specialist analysis, distinct from the date of the bone itself.

The responsible conclusion is therefore neither dismissal nor overstatement. A human visit to Ireland during MIS 3 is plausible and the marked reindeer bone may preserve evidence of one. Permanent settlement, continuous occupation, population size and cultural affiliation are not established. There is no basis for naming a people, reconstructing a camp, or describing a migration as though it were historical fact.

Society Without a Social Record

There is no direct evidence for political institutions, rulers, diplomacy, territorial boundaries, warfare, religion, formal learning or trade networks in Ireland at this date. Those subjects belong to later prehistoric and historic records, not to the sparse MIS 3 evidence. If people did reach the island, they would have been hunter-gatherers operating in a world where food, shelter, weather and animal movements imposed immediate constraints. That is an inference from the wider Upper Palaeolithic of north-west Europe, not a demonstrated description of an Irish community.

Likewise, no Irish art, ritual site, burial, house, textile, boat or tool industry can responsibly be assigned to 31,681 BCE. The absence of such evidence does not prove that no person ever arrived; erosion, later glaciation, sea-level change and the rarity of systematic investigation all reduce survival. But archaeology cannot fill that silence with imagined ceremonies, alliances or everyday routines. The material record currently supports an environmental history first and, at most, a tentative human possibility.

Water, Frost and Uncertainty

The enduring significance of this date lies in that combination of evidence and restraint. Derryvree preserves the waterline of a cold, open wetland beneath later glacial sediments. Castlepook preserves the bones of animals that reveal a richer Ice Age fauna than modern Ireland possesses. Together they show that late-Pleistocene Ireland was environmentally diverse, regionally variable and repeatedly altered by ice, climate and changing sea levels.

For 31,681 BCE, no year-specific Irish event can be written. What can be said is more valuable than an invented chronicle: within a broad calibrated timeframe, parts of Ireland contained periglacial wetlands and open tundra-like habitats; large mammals moved through suitable landscapes; and a single marked reindeer bone raises, but does not settle, the possibility of a very early human presence. The history of this remote Irish world survives in silts, pollen and bone, and its greatest lesson is how much precision the evidence does—and does not—permit.

Chapter 021 of 100

31680 BCE

Bogbean and Reindeer^[21]



31,680 BCE is not a date that archaeology can resolve as a single Irish year. It is a modern calendar label for a point roughly 33,630 calendar years before 1950, conventionally written as c. 33.6 cal ka BP. At this depth of time, even radiocarbon dates come with substantial uncertainties and must be calibrated; deposits may represent many centuries or millennia rather than one season, let alone one day. The responsible subject is therefore Ireland in the later Middle Midlandian cold stage, within Marine Isotope Stage 3 (MIS 3), not an invented episode in a named community's calendar.

There are no securely dated Irish houses, hearths, tool-making floors, burials, monuments, written records or identifiable populations for this notional year. No kingdom, tribe, leader, language, border, treaty or battle can be recovered from the evidence. “Ireland” itself is used here geographically, for the landmass of the modern island, rather than as a political or cultural unit. What survives instead is a difficult but revealing combination of buried freshwater sediments, cave bones, cave calcite, glacial landforms and laboratory dates.

A Cold, Changing Island

This was part of the last Ice Age, but not yet the fullest and best-known expansion of the British–Irish Ice Sheet. MIS 3 was climatically unstable. Across the North Atlantic, colder stadial intervals alternated with relatively milder interstadials on millennial timescales. These shifts affected snowfall, ice margins, river regimes, vegetation and the routes available to animals. Greenland ice cores provide the principal framework for recognising this abrupt variability, but their numbered Greenland events should not be treated as exact Irish weather reports. Irish deposits are too sparse, and their dating too broad, to attach a precise local climatic phase to 31,680 BCE.

Even so, the broad setting is clearer than older simple maps of a permanently ice-covered Ireland suggest. Research on the growth of the British–Irish Ice Sheet indicates dynamic advance and retreat during MIS 3. In north-central Ireland, organic deposits at Derryvree near Maguiresbridge, County Fermanagh, have a calibrated age range of approximately 36.9–31.7 cal ka BP. At Greenagho, near Belcoo in the same county, organic material beneath till has been dated to about 37.2–35.7 cal ka BP. Such ranges show that parts of the island contained ice-free terrestrial and freshwater environments during the wider period, although they cannot prove that every region was open at the same moment.

The later major build-up of Irish ice lay ahead. Evidence from southern Ireland and the adjacent Atlantic shelf indicates that ice expanded markedly after this interval, while the maximum southern extent of the last ice sheet was much later, after c. 24 ka BP. Thus the landscape around the nominal date should be envisaged neither as a settled green island nor as a uniform white cap. It was a severe, regionally varied glacial-edge world: exposed ground in some places, ice or ice-proximal terrain in others, and environments capable of altering quickly as temperature and precipitation changed.

Derryvree's Wet Ground

Derryvree offers the most informative Irish glimpse of everyday ecology near this broad timeframe. Roadworks in 1969 cut through a drumlin and revealed freshwater silts and fine sands sandwiched between tills. The organic layers yielded pollen, plant macrofossils, mosses and insect remains, along with a conventional radiocarbon determination of 30,500 years BP, published with a wide error range. Subsequent calibrations place the deposit broadly across the interval that includes the notional date considered here.

The evidence supports a landscape of open tundra or tundra-like vegetation under periglacial conditions. It does not support later images of Ireland as a forested island of oak, hazel and pasture. Pollen was dominated by herbs, while the macrofossils included plants adapted to cold, wet or open ground. Mosses, sedges, dwarf willow, bogbean and other hardy taxa point towards waterlogged hollows, shallow freshwater, damp margins and sparse vegetation beyond them. The term *muskeg*, sometimes used for the Derryvree setting, conveys an uneven mosaic of saturated mossy and sedgy ground rather than a uniform marsh.

That local wetland mattered in an otherwise exposed environment. Pools and sedge beds could sustain specialised plants and invertebrates; nearby open ground offered seasonal grazing and browsing. Yet Derryvree was a small archive, not a national survey. It demonstrates what survived at one place between episodes of glaciation. It cannot tell us precisely how far such habitat extended across Ulster, much less across Munster, Connacht or Leinster.

The Castlepook Animal World

In north County Cork, Castlepook Cave near Doneraile preserves a complementary record. Long known as Mammoth Cave, it has produced one of Ireland's most important Pleistocene faunal assemblages. Among the animals represented are woolly mammoth, reindeer, giant deer, brown bear, wolf, spotted hyaena, Arctic fox, mountain hare and lemmings. The collection was accumulated over a long period, however, and it is essential not to turn its species list into one simultaneous scene outside the cave entrance.

Direct dating has shown that elements of the Castlepook fauna belong to MIS 3, with several specimens falling broadly between c. 34,000 and 35,000 radiocarbon years ago or receiving later revised ages through improved pretreatment. Reassessment has been necessary because many bones entered museum collections through nineteenth- and early twentieth-century excavations, when stratigraphic recording was far less exacting than it is today. Cave sediments may also be disturbed by scavengers, water, collapse and later excavation. A mammoth bone, a hyaena bone and a reindeer bone from one cave need not represent the same year, generation or even climatic episode.

Nevertheless, the animal evidence decisively establishes that Ireland formed part of a wider north-west European Ice-Age ecological zone. Reindeer indicate cold, open country with seasonal forage; mammoths and giant deer imply substantial plant resources, though not necessarily in the same microhabitats. Lemmings and Arctic fox fit a northern, exposed setting. Wolves and spotted hyaenas reveal a food web in which predators and scavengers moved through the landscape and could carry bones into caves. A cave was therefore not automatically a human shelter: it could be a carnivore den, a trap, a drainage route or a long-term bone archive.

A Reindeer Bone and a Human Question

Castlepook has also become central to the question of whether people reached Ireland during this earlier part of the Upper Palaeolithic. A reindeer femur fragment, recovered from the old cave collection, has been reported as dating to around 33,000 years ago and as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as consistent with butchery by a sharp stone tool. If that interpretation is confirmed, it would be highly significant evidence for a brief human presence in Ireland far earlier than the long-established post-glacial settlement record.

The finding must be framed as evidence under assessment, not as proof of a settled Palaeolithic population. The dated bone gives the age of the animal, rather than independently dating the mark, the place where it died or the length of any human visit. The specimen lacks the secure modern-excavation context that would accompany an occupation surface. No associated hearth, stone-tool assemblage, dwelling, burial, artwork or food-processing area of comparable antiquity has yet demonstrated a community at Castlepook. Bone marks must also be distinguished carefully from carnivore damage, trampling, sediment abrasion, weathering and excavation damage.

Accordingly, it is reasonable to say that people may have visited or passed through Ireland in this period, perhaps as highly mobile hunter-gatherers operating within the broader Upper Palaeolithic world of north-west Europe. It is not reasonable to describe farms, villages, clans, permanent routes, trade systems or continuous occupation. The National Museum of Ireland's general account remains cautious about clear Palaeolithic human evidence on the island, a useful reminder that an important individual specimen does not settle every archaeological question.

What Cannot Be Claimed

Society is visible only indirectly. If people did butcher the Castlepook reindeer, the action would imply practical knowledge of carcass processing and sharp stone edges, as well as access to meat, hide, sinew, fat and bone. It does not reveal their names, numbers, kinship, language, beliefs or social authority. There is no evidence for ritual, formal religion or learning in Ireland at this date, though Upper Palaeolithic people elsewhere in Europe possessed sophisticated technical and symbolic traditions. Those continental comparisons provide context, not missing Irish facts.

There is likewise no evidence for political affairs, diplomacy or organised conflict. Animals could move during periods of lower sea level and altered coastal geography, but this does not demonstrate a reliable human land route, a trading network or regular contact. The economically important processes were ecological: plants colonising open ground, herbivores finding forage, carnivores following prey, and ice advance repeatedly remodelling the terrain. In the long view, those processes shaped the physical stage upon which much later human settlement became possible.

Ireland around 31,680 BCE was therefore not empty of history, but its history is environmental and evidential rather than narrative. The damp sedge-and-moss deposits of Fermanagh and the reindeer-rich cave record of north Cork reveal an island intermittently capable of supporting life at the edge of profound climatic change. They offer firm evidence for cold habitats and Ice-Age fauna, a plausible but still limited human question at Castlepook, and no licence to invent the people or events that the record has not preserved.

Chapter 022 of 100

31679 BCE

Fermanagh Between the Tills^[22]



The label 31,679 BCE is a modern chronological convenience, not a year that can be recovered from Irish evidence with calendar-like precision. It corresponds approximately to 33,628 calibrated years before present (cal BP, with “present” conventionally fixed at AD 1950). At this depth of time, radiocarbon measurements must be calibrated and normally produce ranges rather than a single date. The responsible subject is therefore not an event in one Irish year, but the Late Pleistocene world broadly surrounding it: a cold, unstable interval within Marine Isotope Stage 3, before the fullest expansion of the last British–Irish Ice Sheet.

Ireland then had no recorded names, rulers, peoples, frontiers or calendar. Nor can archaeology identify a polity, a diplomatic relationship, a battle, a religion or a language. What can be investigated is more fundamental: whether parts of the island were ice-free, what plants and animals occupied them, how caves and sediments accumulated, and whether the faintest traces point to human visitors. The evidence is fragmentary, often recovered long ago, and frequently disturbed by water, frost, scavengers and later glaciation. Its value lies precisely in the way it sets limits on what can honestly be said.

An Interval, Not an Anniversary

The date belongs to the later part of the last Ice Age, but it should not be imagined as the familiar image of an island uniformly buried beneath ice. The maximum extent of the last Irish ice sheet came later. Research on the British–Irish Ice Sheet places its broad maximum on the Irish shelf and mainland chiefly between roughly 27,000 and 23,000 cal BP, although ice advance was asynchronous in different regions. Around 33,600 cal BP, glaciers and ice caps were important and growing features of the north-west European world, yet Ireland’s environmental history was locally varied.

This distinction matters. A layer of till records an advancing or overriding glacier; an organic bed between tills can preserve a period when a particular place supported water, vegetation and animal life. It does not mean that the whole island enjoyed the same conditions at the same moment. Nor can a date from one bone or peat layer turn into a national weather report. The Irish record is instead a mosaic of surviving windows, separated by large areas where later ice erosion removed or scrambled evidence.

The modern dating language is itself a safeguard. “Radiocarbon years before present” are not identical to calendar years because atmospheric carbon-14 levels have changed through time. The IntCal20 calibration curve allows researchers to translate measurements into probability ranges, but uncertainty remains, especially this far back. Thus 31,679 BCE should be read as a point within a millennial-scale horizon, not as a dated episode in which an identifiable Irish community did something memorable.

Derryvree’s Buried Wetland

The clearest Irish environmental evidence relevant to this broad horizon comes from Derryvree near Maguiresbridge, County Fermanagh. There, freshwater organic sediments and silts were found sandwiched between an older lower till and a later upper till inside a drumlin sequence. The placement is crucial: it demonstrates that, between phases of glaciation, this locality possessed a non-glacial freshwater environment capable of preserving plant and animal remains before subsequent ice sealed it beneath glacial sediment.

The Derryvree deposit has traditionally been assigned to the Middle Midlandian, the Irish term for part of the last cold stage, and has a reported radiocarbon determination of about 30,500 radiocarbon years BP. That is not a precise equivalent of 31,679 BCE, and the relationship between old radiocarbon dates, calibration and regional ice advances must be handled carefully. Nevertheless, its flora, insect evidence and stratigraphic setting illuminate the kind of Irish landscape that existed during the wider middle part of the last glaciation.

It was an open, cold and largely treeless environment, not a landscape of oak woods, hedged fields or familiar bog pasture. Mosses, sedges and aquatic plants indicate wet ground, pools and sluggish freshwater. Fossil evidence has been associated with plants such as bogbean, water-milfoil, lesser clubmoss and Irish saxifrage, species or relatives of species adapted to open, moist and often cold conditions. Insect remains likewise point towards a northern, periglacial climate. The term *muskeg* has sometimes been used as a useful modern comparison: waterlogged, mossy and sedge-rich ground, broken by shallow water, in a short-growing-season climate.

That comparison is an interpretation, not a literal reconstruction. Derryvree does not supply a complete view of every season, nor an exact map of local vegetation. It does show, however, that parts of Ireland could sustain freshwater habitats and tundra-like plant communities in the broad era before later ice became dominant. The later upper till both ended the local record and helped preserve it: a reminder that ice destroyed much evidence while also sealing a few exceptional archives.

Animals of the Cork Caves

For large mammals, Castlepook Cave near Doneraile in north County Cork is indispensable. Antiquarian excavations there, published in 1918, produced an extraordinary but difficult cave assemblage. Subsequent work on the Irish Quaternary Fauna Project showed that a wide range of

mammals reached Ireland at various points between at least about 45,000 and 20,000 years ago. Castlepook is especially associated with remains of woolly mammoth, reindeer, brown bear, wolf, fox and spotted or cave hyena.

This is strong evidence that Ireland was not biologically empty throughout the last cold stage. Reindeer and other grazing animals could occupy open country when conditions and routes permitted; large carnivores followed prey or used caves as refuges and dens. Mammoth remains indicate that animals of the wider north-west European cold-steppe fauna reached the island at some stage. Hyena material is especially important because hyenas can accumulate bones in dens, carry in prey parts, gnaw and digest bone, and mix remains gathered at different times.

Consequently, Castlepook's faunal list must not be treated as a single herd and predator group observed together in 31,679 BCE. Individual specimens carry different dates, and cave deposits can be palimpsests created over many millennia. Water movement, roof collapse, carnivore activity and early excavation methods further complicate original associations. The cave offers persuasive evidence for a changing Ice Age animal world in Ireland, but not a precise census of north Cork in one season.

The cave also corrects a modern misconception embedded in the phrase "Irish elk". The giant deer later famous from Irish fossil finds was not the defining evidence for this particular interval. The better-supported picture around the broader Middle Midlandian is of open habitats capable of supporting mobile cold-climate fauna, with reindeer, mammoth and carnivores among the animals documented at different times in the cave record. Their movements depended on changing ice margins, vegetation, weather and access across the surrounding shelf and seaways.

The Human Question

One Castlepook reindeer femur has been presented in recent public reporting as bearing a deep fresh-bone incision consistent with cutting or chopping by a sharp stone implement, and as dating to roughly 33,000 years ago. If the mark is accepted as anthropogenic and contemporary with the animal's death, it would be potentially momentous: evidence that people handled a reindeer carcass in Ireland far earlier than the island's long-established post-glacial archaeological record.

That possibility should neither be dismissed nor overstated. The femur derives from an old cave collection rather than a modern excavation of an intact occupation floor. A radiocarbon result dates the animal bone, not automatically the act that produced a mark, the identity of the marker, the place where the animal died, or the duration of a human visit. No securely associated Upper Palaeolithic stone-tool assemblage, hearth, dwelling, burial, art panel or settlement surface has yet been published from Castlepook for this age. The National Museum of Ireland accordingly continues to state that clear evidence for Palaeolithic human presence in Ireland has not emerged.

The most careful conclusion is that a brief human incursion is possible, and the marked reindeer bone may prove to be a significant clue. It does not demonstrate a permanent population, a continuous occupation from the Palaeolithic to later Ireland, or membership of a named archaeological culture. Nor does it permit claims about kinship, leadership, ritual, trade networks or warfare. If people did reach the island, comparison with Upper Palaeolithic groups elsewhere in north-west Europe suggests highly mobile hunter-gatherers using perishable equipment and stone-edged tools; that is a reasoned comparison, not direct evidence of an Irish camp.

What Cannot Yet Be Written

There were no Irish states, kingships or diplomatic systems that archaeology can identify at this date. There is no evidence for organised conflict, territorial government, farming, herding, pottery production, metalwork, formal trade, literacy or monuments. There is equally no evidence from which to reconstruct religious observance, stories, music, teaching or language. The absence of such evidence does not prove that any possible visitors had no beliefs or social relationships. It means only that the surviving Irish record cannot describe them responsibly.

Economically, the securely evidenced activity is ecological rather than human: freshwater plants grew, large herbivores found usable open ground, and carnivores exploited animal carcasses and caves. If the Castlepook incision is verified, it would add one narrow human action—processing a reindeer carcass—to that picture. It would not establish regular hunting grounds or exchange routes. Even access to Ireland remains a question requiring caution, because sea level, ice margins and coastlines changed substantially, while potential coastal evidence has often been submerged, eroded or buried.

For 31,679 BCE, then, Irish history survives not as a chronicle but as an argument from sediments, bones and geological sequences. Fermanagh preserves the image of cold freshwater ground between advancing ice sheets; north Cork preserves animal remains from a wider Pleistocene world and a provocative, unresolved possible human trace. Together they reveal an Ireland that was environmentally alive, climatically precarious and archaeologically elusive—an island whose later glacial transformation would conceal much of the evidence needed to tell a fuller human story.

Chapter 023 of 100

31678 BCE

The Maguiresbridge Freshwater Series ^[23]



31,678 BCE is a modern chronological label, not a year that anybody living in Ireland could have named, recorded or commemorated. It corresponds approximately to 33,600 calendar years before AD 1950 and falls in the later part of the Late Pleistocene, broadly within Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. Modern calendar-year precision is not available at this depth of time. The responsible history of Ireland is therefore not an account of an event in one recoverable year, but a reconstruction from deposits, fossil bones, pollen, plant remains, insects, landforms and radiocarbon measurements with wide calibrated ranges.

A Date Within Broad Ranges

The closest 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 lying between two thick and distinct tills: sediments deposited directly by glacier ice. The order of those layers is crucial. Ice had first crossed the district; a period followed in which freshwater sediment and organic material accumulated in an ice-free or largely ice-free setting; then a later glacier advanced and sealed the evidence beneath another till sheet.

Organic material from the Derryvree deposits produced a radiocarbon age of 30,500, with an uncertainty of +1,170 and -1,030 radiocarbon years before present. Calibrated with modern curves, this belongs broadly to about 36,900–31,700 calibrated years BP. The nominal date of 31,678 BCE falls within that wide span, but it would be mistaken to claim that the silts describe that particular year, season or generation. A radiocarbon determination dates the death of sampled organic matter, while a sediment bed can represent a succession of episodes. The result is nevertheless strong evidence that part of northern Ireland sustained a cold freshwater landscape during this general period, before renewed glaciation.

Wet Tundra Beneath Later Ice

Derryvree's pollen, plant macrofossils, mosses and insect remains indicate open tundra vegetation and a periglacial climate. "Periglacial" does not simply mean frozen solid: it describes landscapes intensely shaped by frost, thaw, seasonal waterlogging and short growing seasons near an ice-sheet environment. The local scene was likely a mosaic of shallow pools, silty water margins, sedges, mossy ground, low-growing herbs and sparse shrubs. Fossil evidence includes bogbean, water-milfoil and mountain avens, plants that help show that even a severe Ice Age landscape contained freshwater habitats and productive summer growth.

This was not a familiar Ireland of oak woodland, hedged fields and deep peat bogs. Nor was it necessarily an unbroken white wilderness. The evidence points instead to treeless open country, in which wet basins and exposed ground differed sharply over short distances. Winter conditions were severe, the ground may often have been frozen beneath the surface, and vegetation had a limited season in which to flower, seed and support grazing animals. Small amounts of tree pollen should not be treated as proof of nearby forest: pollen can travel considerable distances, whereas the broader plant and insect assemblage supports an open, cold environment.

Derryvree is a local archive rather than a weather station for the whole island. Ireland's terrain, Atlantic exposure, drainage and changing ice margins would have created regional variation. Nearby Greenagho, also in Fermanagh, preserves another organic deposit beneath later till, dated to an earlier part of MIS 3. Together, such sites disprove a simple picture of Ireland as continuously buried beneath ice throughout the period. They do not, however, establish that every district was habitable, ice-free or environmentally alike at the same time.

Animals and Cave Archives

The principal southern Irish archive is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations undertaken mainly in the early twentieth century recovered a remarkable collection of Pleistocene animal remains. These include reindeer, brown bear, spotted hyaena, wolf or fox, mountain hare, giant deer and woolly mammoth. Modern redating has shown that some Castlepook material is substantially older than radiocarbon results obtained in the 1990s had suggested, placing important elements of the fauna firmly within MIS 3.

The cave should not be imagined as a single camp or a snapshot of one hunting season. It was used or entered at different times by animals and carnivores; bones could be gnawed, dragged inside, reworked by water, disturbed by roof-fall or redistributed during excavation. The fact that several species occur in the collection demonstrates that Ireland supported a varied cold-stage fauna over a long interval. It does not prove that every listed species shared the cave, valley or decade at once. This distinction is especially important because much of the collection was excavated before modern standards of stratigraphic recording and taphonomic analysis.

Still, the assemblage permits a cautious view of a food web. Large herbivores such as reindeer and giant deer would have used open vegetation; hare and small mammals occupied the same broader cold-country world; predators and scavengers followed opportunities created by living prey and carcasses. Spotted hyaenas at Castlepook are particularly revealing. Their presence demonstrates that the fauna of Ice Age Ireland was not limited to the animals later familiar from a temperate island. Mammoth remains show that exceptionally large grazing mammals also reached Ireland during parts of this wider climatic phase.

The Human Question

There is no securely excavated house, hearth, burial, stone-tool assemblage or occupation surface in Ireland dating to around 31,678 BCE. Consequently, there is no responsible basis for describing a settled population, political community, leaders, alliances, warfare, diplomacy, language or religious institution. There is likewise no evidence for trade networks, cultivated crops, domesticated animals, pottery, metalworking, monuments or formal learning. Silence in the archaeological record does not prove that any people who reached the island lacked stories, kinship, beliefs, skills or social rules; it means that these matters cannot be specified for Ireland from the surviving evidence.

One find keeps the question of human presence open. A reindeer femur from Castlepook has been reported as bearing a deep modification interpreted by Ruth Carden as a cut or chopping mark made on fresh bone with a sharp stone tool. The bone has been presented as dating to roughly 33,000 years ago. If that interpretation is confirmed by further study and supported by new excavation, it may indicate that a person or small mobile group processed a reindeer in Ireland during the Upper Palaeolithic. It would not demonstrate permanent settlement, a village, a continuous population or the precise circumstances of the animal's death.

The distinction between evidence and interpretation matters. A date on the bone establishes the age of the animal, not automatically the date or agent of every mark on its surface. A cave bone may have travelled through several hands—or jaws—before burial. The National Museum of Ireland continues to state that clear evidence for human presence during the Irish Palaeolithic has not yet emerged, while current research projects are revisiting Castlepook's old collections and surviving sediments. The most prudent conclusion is that brief human incursions are possible and the marked femur is potentially important, but Palaeolithic occupation of Ireland at this time remains unproven.

Approaching a Major Transformation

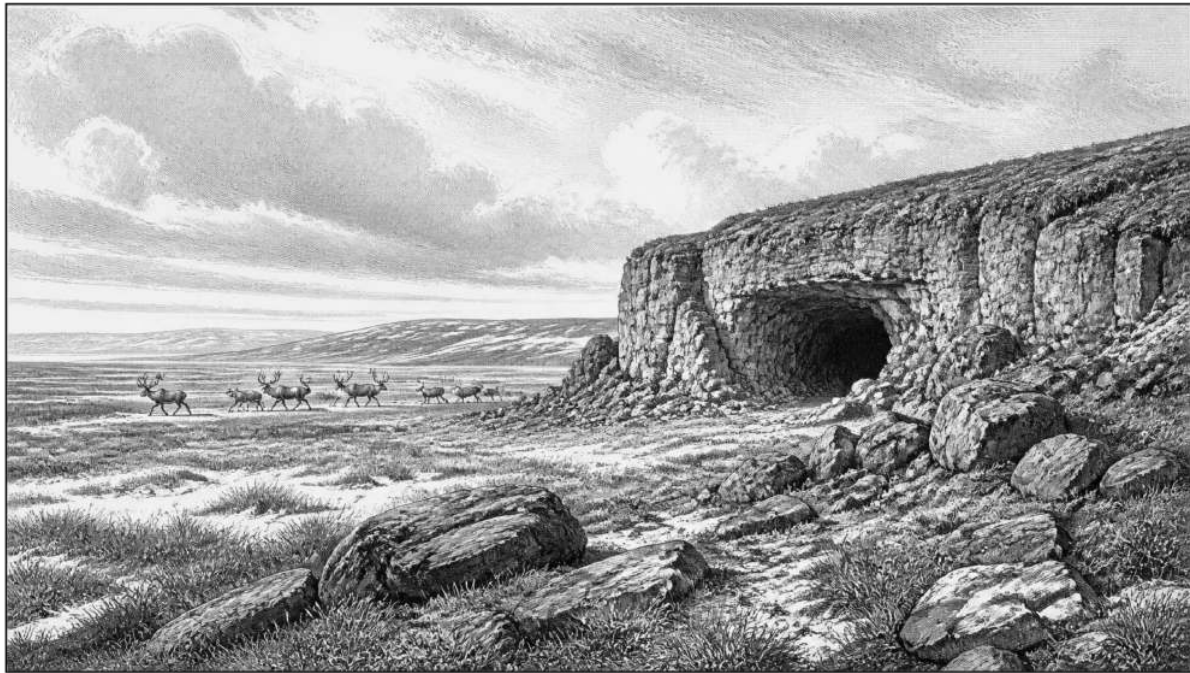
In longer-term perspective, this was an Ireland on the approach to the great expansion of the last British–Irish Ice Sheet. Ice-sheet reconstructions show that growth, maximum extent and retreat were neither simple nor uniform: margins advanced and changed in different regions over thousands of years. Derryvree records a comparatively open interval before later ice erased or buried much of the earlier landscape. The drumlin through which the road was cut is itself a reminder that subsequent glaciation profoundly reshaped the country and destroyed much of the evidence that might otherwise have survived.

For that reason, Derryvree and Castlepook have importance beyond their individual finds. One preserves a freshwater tundra landscape trapped between tills in Fermanagh; the other preserves a complex animal archive in a Cork limestone cave. Together they show that Ireland around the broad horizon represented by 31,678 BCE was environmentally dynamic, biologically inhabited and archaeologically elusive. Its history is not yet a history of named people or events. It is a history of ice, water, plants, animals, caves and the careful limits of what the evidence can bear.

Chapter 024 of 100

31677 BCE

The Castlepook Carcass^[24]



“31,677 BCE” is a modern chronological label, not a year that can be recovered from the Irish archaeological record. No calendar, written testimony or event sequence allows historians to isolate a particular season, person or occurrence on the island at such depth of time. Expressed in the conventional archaeological scale of years before AD 1950, it falls roughly around 33.6 thousand calendar years ago. The responsible frame is therefore a broad one: later Marine Isotope Stage 3 (MIS 3), a volatile interval of the Last Glacial period conventionally spanning about 57,000 to 29,000 years ago. Ireland’s evidence is sparse, discontinuous and often derived from old cave excavations. Yet it is sufficient to illuminate an Ice Age world of changing ice margins, open habitats and large animals—and to raise a difficult, important question about very early human visits.

A Date Range, Not a Dated Event

Radiocarbon dates do not translate directly into calendar years. Atmospheric radiocarbon varied through time, so laboratory measurements must be calibrated against independently constructed curves; at around 34,000 years ago, the resulting calendar ranges are necessarily broader than a single historical year. The numbered date should consequently be read as an approximate point within a span of centuries or millennia, rather than as a precise anniversary. It belongs to the Pleistocene, long before farming, permanent villages, metalworking, Irish languages, kingdoms or even the persistent settlement that later made an identifiable human history of Ireland possible.

This was also before the fullest known expansion of the last British–Irish Ice Sheet. Research on the ice sheet shows that its growth, extent and timing were dynamic and remain actively debated, especially before the Last Glacial Maximum. The maximum advance in the Irish Sea sector is generally placed much later, around 25,000–23,000 years before present, while wider reconstructions treat the period from

roughly 31,000 years ago onward as one of major ice-sheet growth. At the notional date used here, Ireland was not simply a uniformly frozen island. It was part of a shifting north-west European glacial environment in which ice, sea level, rivers, exposed ground and habitable refuges changed over long periods.

Castlepook's Fragmentary Archive

The chief Irish source for this period is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavated principally in the early twentieth century, it produced a remarkable accumulation of Pleistocene bones, now largely held by the National Museum of Ireland. Later re-examination and renewed radiocarbon work have made clear both the value and the complexity of the collection. The cave was not a neatly sealed prehistoric campsite. It was used or entered by animals over long intervals; bones could be carried in by carnivores, moved by water or sediment, and mixed through older excavation methods. Each specimen must therefore be assessed on its own provenance and date, rather than treated as proof that every recorded animal lived together at one moment.

Even so, Castlepook establishes that southern Ireland supported, at different points during MIS 3, a striking cold-stage fauna. The wider cave record includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Directly dated Irish cave material indicates that a diverse mammal fauna colonised or re-colonised parts of Ireland between at least about 45,000 and 20,000 years ago. Re-dating has also demonstrated that some earlier determinations substantially underestimated the age of Castlepook specimens. The evidence is strongest for animal presence; it offers a real ecological record, but not a single snapshot of a 31,677 BCE landscape.

The most evocative find is a reindeer femur bearing a deep incision. County Cork heritage publications and zooarchaeologist Ruth Carden identify the mark as damage made by a sharp stone implement during butchery, and associate the bone with roughly 31,000 BCE in popular calendar terms. That makes it directly relevant to the period around this article's notional date. If the diagnosis is accepted, the specimen may represent the earliest currently claimed evidence for human activity in Ireland, immensely earlier than the formerly accepted Late Upper Palaeolithic evidence from a cut-marked bear patella in County Clare, dated to around 12,800–12,600 calibrated years before present.

The Reindeer Bone Question

Its importance should not erase its limitations. The date of an animal bone is the date of the animal's death, not automatically the date, place or agent of every mark upon it. Identifying a cut mark requires specialist taphonomic judgement: stone-tool damage must be distinguished from carnivore action, trampling, sediment abrasion, excavation damage and other processes. In addition, the femur comes from an old cave collection rather than a modern excavation of an undisturbed floor with associated hearths and tools. A cautious account can say that the bone is potentially compelling evidence that people processed a reindeer in Ireland during the Upper Palaeolithic. It cannot claim to have found a settlement, a hunting camp or an established population.

No securely associated stone-tool assemblage, hearth, dwelling, burial, artwork or repeated domestic refuse of this age has been identified in Ireland. Nor does the bone show whether a person killed the animal, encountered a carcass, removed meat, hide, sinew or marrow, or processed it elsewhere before a

carnivore took part of the remains into the cave. The search for surviving Pleistocene deposits at Castlepook is therefore more than a local excavation project: intact stratified deposits could test whether this isolated clue belongs to a wider human presence or remains an exceptional trace.

Mobility Without a Map

If people did reach Ireland in this period, they were almost certainly highly mobile hunter-gatherers, but this is an inference from the marked bone and the wider Upper Palaeolithic world, not a demonstrated description of an Irish community. Reindeer were a valuable resource, supplying meat, fat, skins, sinews and bone. Groups elsewhere in northern Europe used stone technology, travelled through large territories and maintained social connections across considerable distances. None of that proves an Irish equivalent in detail. It does, however, make a brief visit or seasonal incursion more plausible than any image of a settled Ice Age village.

Travel itself is uncertain. Lower global sea levels exposed far more continental shelf than exists today, and animal movements between Britain and Ireland plainly occurred in some form during favourable phases: the Castlepook fauna is evidence of connection, not proof of a particular route. Whether a continuous land passage, temporary islands, shore routes, seasonal ice or short water crossings were available at one precise moment cannot be securely reconstructed for 31,677 BCE. It would be irresponsible to describe hunters simply walking from Britain, or to assign them a homeland, language, ethnicity or ancestral relationship with later Irish people.

Society Beyond the Evidence

There were no known political institutions in Ireland at this date. Archaeology provides no basis for naming chiefs, territories, alliances, wars or diplomatic relations. A cave bone cannot reveal a hierarchy, household size or social boundary. Likewise, there is no Irish evidence from this time for ritual practice, formal burial, religious belief, visual art, music or systems of learning. The rich cave art, ornaments and symbolic objects known from some contemporary parts of Europe show what Upper Palaeolithic *Homo sapiens* could create; they must not be transferred automatically across the sea to Ireland.

Economic evidence is equally narrow. There was no agriculture, stock-raising, field system, permanent market or demonstrated exchange network on the island. The possible processing of a reindeer is the only economic act that can be cautiously envisaged here, and even that rests on one contested but significant specimen. Carnivores were probably major agents in the cave's formation: hyaenas, wolves and other scavengers could transport bones, consume carcasses and turn a cave into a den or feeding place. The cave archive records animal behaviour as much as, and perhaps more than, human behaviour.

An Open, Harsh Landscape

The fauna points towards a largely open, cold environment rather than modern Ireland's wooded and pasture-rich scenery. Reindeer, Arctic foxes and lemmings are compatible with tundra or steppe-tundra conditions, while mammoth and giant deer evoke broad grass-and-herb landscapes capable of supporting large grazers and browsers. Such labels should be used cautiously: the island's climate and vegetation altered repeatedly across MIS 3, and cave bones alone cannot map every valley. Local shelter, slope, soil

moisture and proximity to ice would have created ecological mosaics. In southern Ireland, limestone caves could preserve the remains of this world far better than exposed surfaces later overridden, eroded or buried by glacial processes.

The scale of the subsequent transformation matters. Later ice-sheet advance reshaped landforms, removed or concealed many earlier deposits and helped explain why evidence for Palaeolithic Ireland is so much thinner than that of Britain or continental Europe. Absence of excavated camps is not absolute proof that nobody ever came; it is, however, a powerful warning against constructing a populated prehistoric landscape from a single bone.

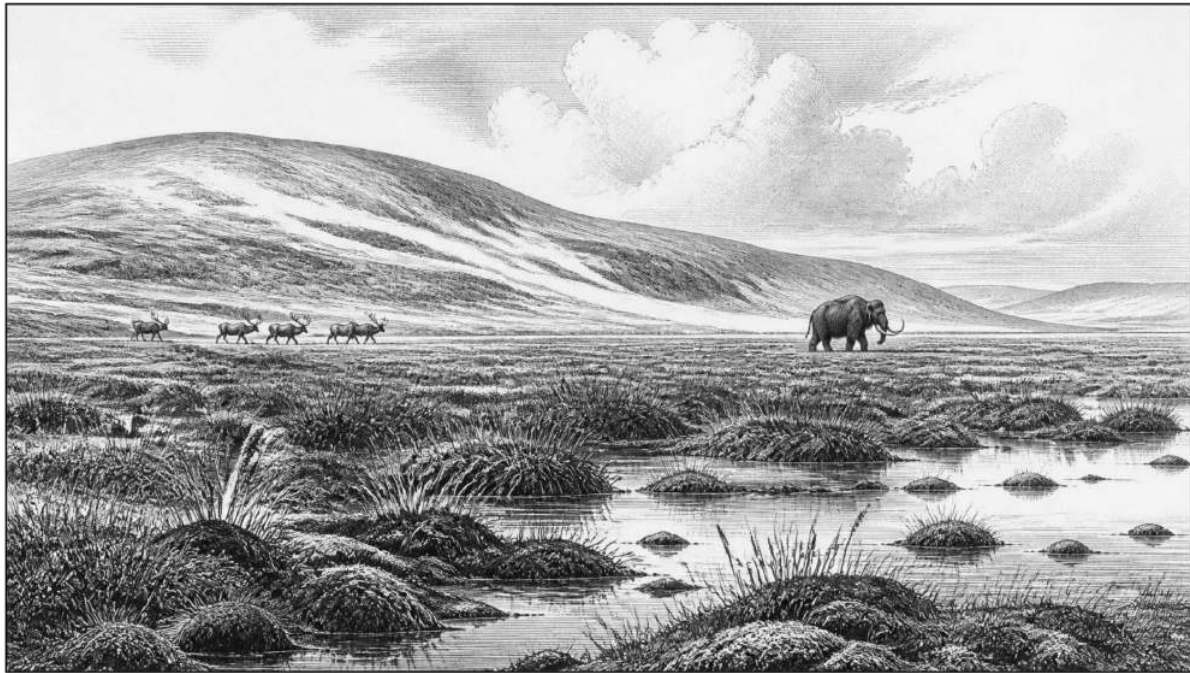
What Can Be Said Responsibly

Around the modernly assigned date of 31,677 BCE, Ireland lay in a changing Ice Age zone, probably supporting open-country mammals during at least some phases and connected ecologically, if not always straightforwardly by dry land, to the wider north-west European world. Castlepook Cave preserves the country's most consequential evidence for that setting. Its reindeer femur may record human butchery, but it does not yet establish permanent occupation. The principal development is therefore not a king's accession, a battle or a foundation. It is the survival of a fragile archaeological possibility: that Upper Palaeolithic people briefly reached an Ireland whose animals, climate and physical geography were profoundly unlike those of the island today.

Chapter 025 of 100

31676 BCE

Mammoth Cave's Cold Corridor^[25]



For Ireland, 31,676 BCE is not a year that can be recovered from human memory, written record or an archaeological calendar. It is a modern chronological label, equivalent only approximately to 33,600 calibrated years before present (cal BP, with “present” conventionally AD 1950). At this depth of time, radiocarbon calibration, laboratory uncertainty and the slow accumulation or disturbance of deposits make single-year precision impossible. The responsible history is therefore a history of an interval: later Marine Isotope Stage 3, within the Midlandian cold stage of the Irish Quaternary, before the fullest expansion of the last British–Irish Ice Sheet.

That interval matters because Ireland preserves a few unusually revealing, but very incomplete, traces. Freshwater sediments beneath a drumlin at Derryvree near Maguiresbridge, County Fermanagh, record an ice-free phase in the north. Cave deposits at Castlepook, or Mammoth Cave, near Doneraile in north County Cork contain the island’s most celebrated assemblage of Ice Age animal remains. A reindeer femur from the Castlepook collection has also prompted a consequential, still cautious debate about whether people briefly reached Ireland. None of this amounts to a dated event in 31,676 BCE. Together, however, the evidence gives a defensible picture of the country’s changing environments and the limits of what can be said about human life.

An Interval Rather Than a Date

Marine Isotope Stage 3, broadly spanning about 57,000 to 29,000 years ago, was not a single, uniformly frozen age. Across the North Atlantic it was marked by abrupt climatic oscillations: relatively milder interstadial episodes alternated with colder stadials. Temperature, precipitation, sea level,

vegetation, river activity and the reach of glaciers all responded. Ireland's record is too fragmentary to map those changes year by year, or even always century by century. It does show that the familiar image of an island continuously buried beneath a single immobile ice cap is wrong.

Recent reconstruction of the last British–Irish Ice Sheet places its principal growth from about 31,000 years ago, with maximum volume later, around 23,000 years ago. At the notional date considered here, the major later ice expansion was still ahead. Yet this does not mean that all Ireland was a hospitable, ice-free plain. Glaciation was regional, recurrent and dynamic. Earlier ice had shaped the terrain, while local ice masses, snowfields, frozen ground, wind action and meltwater affected particular districts differently. Uplands, coasts, river valleys and limestone cave systems would have offered sharply contrasting conditions.

Sea level was much lower than today because immense quantities of water were held in northern ice sheets. The exposed continental shelves changed the geography of north-west Europe, but it is unsafe to turn that fact into a simple claim of a dry, permanent land bridge from Britain to Ireland. Marine and relative-sea-level research has long questioned such a bridge. Animal movement may have been aided at different times by altered coastlines, short water crossings, islands, shore ice or glacial connections, but the precise routes remain uncertain. Ireland's Pleistocene fauna demonstrates connectivity of some sort; it does not by itself identify a road followed by herds or people.

Wet Ground Beneath the Drumlins

The Derryvree sequence is central to understanding this broader setting. Roadworks in 1969 cut through a drumlin about two kilometres north-east of Maguiresbridge and exposed freshwater silts and fine sands enclosed between two substantial tills. Till is debris deposited directly by glacier ice. The order of the layers is crucial evidence: glacial ice deposited the lower till, a freshwater environment later developed, and a further ice advance sealed the sediments under upper till. The deposit is therefore an environmental window between episodes of glaciation, not evidence for a continuously benign climate.

Organic material from Derryvree gave a radiocarbon age which, when calibrated, has been placed broadly at about 36,900–31,700 cal BP. The nominal year 31,676 BCE falls near this wide range, but it cannot be placed confidently at a particular level or season within it. Pollen, plant macrofossils and insects point to cold, open conditions rather than a closed temperate forest. Sedges, grasses, herbs, mosses and low shrubs occupied wet and exposed ground. The term “muskeg” has been used for the waterlogged, mossy terrain inferred from the deposits. There may have been shallow pools, sluggish streams and productive margins, but no evidence supports a vision of modern bogland, meadow or woodland transplanted into the Ice Age.

This was a landscape in which microhabitats mattered. Ground sheltered from the wind, south-facing slopes, stream edges and patches where snow melted early could have supported more vegetation than exposed ridges. In colder seasons, frozen ground and sparse cover would have restricted plant growth; in milder intervals, water and fresh forage could be concentrated around wetlands. Such variation helps explain why animal presence need not imply that every part of Ireland was equally habitable. It also explains the importance of buried sediments: later ice destroyed or obscured much of the land surface on which animals, and any people, once moved.

Castlepook's Faunal Record

Far to the south, Castlepook Cave preserves a different kind of archive. Excavations in the early twentieth century recovered a very large and heterogeneous collection of bones from the limestone cave system near Doneraile. The National Museum of Ireland identifies Castlepook as the country's most important site for mammals of the last cold stage. Its recorded fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming, Norway lemming and spotted hyena. A cave hyena skull from the site is especially striking: no hyenas live in Ireland or Europe today, but their fossils establish that these powerful carnivores once reached the island.

The collection must nevertheless be used carefully. Cave deposits can accumulate over long periods through carnivore activity, natural deaths, water movement, collapse and later disturbance. The older excavations also pre-date modern stratigraphic standards. A date obtained from one bone dates that animal, not necessarily every specimen in the cave or the exact moment at which a bone was deposited. Reassessment of the Castlepook radiocarbon chronology has emphasised these difficulties. The sound conclusion is that parts of Ireland supported a succession of cold-stage mammals between roughly 45,000 and 30,000 years ago, not that every listed species stood together in a single herd or shared one season at 31,676 BCE.

Even with that caution, the ecological implications are substantial. Reindeer and lemmings indicate environments unlike later wooded Ireland, while mammoths required enough plant biomass to sustain very large herbivores. Wolves, foxes and hyenas point to a food web containing carcasses and prey. Giant deer were not exclusively an Irish animal despite their later popular name; they ranged widely across Eurasia. Castlepook instead shows that Ireland lay, intermittently, at the north-western edge of wider European faunal worlds. It was neither a timeless wilderness nor the isolated, temperate island known in recent millennia.

A Possible Human Trace

The most arresting claim associated with this period concerns a reindeer femur from Castlepook. Ruth Carden's examination identified a deep surface mark interpreted as consistent with a stone-tool cut made during carcass processing, and public heritage material has placed the bone at around 31,000 BCE. If the mark is ultimately confirmed as anthropogenic, it would be evidence that people reached Ireland far earlier than the well-established post-glacial settlement record. It would also place a possible human action in the broad chronological neighbourhood of this article's nominal date.

But the distinction between evidence and interpretation is essential. The bone itself is direct evidence for a reindeer. Its radiocarbon result is evidence for the age of that animal within a broad calibrated range. The claim that the incision was made by a human tool rests on taphonomic analysis: researchers must distinguish deliberate cutting from carnivore damage, trampling, abrasion, breakage and other natural processes. Nor does one modified bone establish who made a mark, whether they hunted the animal, how many people were present, how long they stayed or whether they returned.

No securely associated house, hearth, stone-tool assemblage, burial, human bone, art or occupation surface has yet demonstrated a resident Upper Palaeolithic community in Ireland at this time. It is possible that a small, highly mobile party entered the island briefly and processed an animal; it is equally necessary to acknowledge that the claimed evidence remains isolated and that research at Castlepook continues. The cave is an important place for asking whether Ireland had fleeting Palaeolithic visitors, not a licence to invent a settled hunting society.

What Cannot Be Recovered

Accordingly, there is no responsible political narrative for 31,676 BCE. No chieftdom, kingdom, boundary, diplomatic encounter, war, treaty, language group or named people can be identified. There is no evidence for farming, livestock, fields, permanent villages, trade in goods, monuments, formal religious institutions or systems of learning. Reindeer, mammoths and hyenas are not evidence for human economy; they are evidence for the animals that occupied parts of the island. Likewise, a possible cut-mark is not evidence for a social order.

Religion and culture are similarly beyond recovery. People, if present, may have possessed rich beliefs, skills and oral traditions, as Upper Palaeolithic groups elsewhere certainly did. Yet comparisons with Britain or continental Europe cannot fill Ireland's evidential silence with particular rituals, artworks or technologies. The appropriate historical lesson is methodological as well as prehistoric: absence of evidence is not proof that nothing happened, but it is a firm reason not to manufacture detail.

A Landscape Soon to Change

The importance of this horizon lies in its precariousness. Derryvree's wet, treeless interval was eventually overrun and buried by ice. The animals represented at Castlepook belonged to ecological communities that would be repeatedly disrupted as the climate deteriorated and the last ice sheet expanded. Later glaciation scoured landscapes, shifted sediments and limited the survival of archaeological traces. Around 31,676 BCE, Ireland's history is therefore best read through drumlin silts, cave bones and carefully calibrated dates: a cold, varied country, intermittently accessible to large mammals, and perhaps briefly to people, but not yet a recoverable human society.

Chapter 026 of 100

31675 BCE

The Irish Sea Threshold ^[26]



31,675 BCE is not a date at which Ireland's archaeological record can identify a particular event. No written calendar existed, and no deposit can be tied responsibly to a named year, season, person or community. The number is a modern retrospective label, roughly 33,624 years before the conventional scientific present of AD 1950. At this depth of time, radiocarbon measurements must be calibrated and are normally expressed as ranges rather than single dates. The most responsible view is therefore of a broader interval: late Pleistocene Ireland during Marine Isotope Stage 3, close to the onset of the major growth of the last British–Irish Ice Sheet.

A Changing Ice-Age Island

In the wider North Atlantic climate sequence, this approximate point falls within a short-lived relatively mild episode known as Greenland Interstadial 6, conventionally placed at about 34.7–33.3 thousand years before 1950. Such an interval did not mean modern warmth. It meant a change within an ice-age world: temperatures, vegetation, animal ranges, snowfall and the edges of glaciers could all alter markedly across centuries and millennia. Ireland lay on the western margin of north-west Europe, exposed to Atlantic weather and to the unstable interaction of sea, ice and land.

It would be misleading to picture the whole island under the great continuous ice sheet usually associated with the Last Glacial Maximum. The best current reconstructions place the decisive, sustained build-up of the British–Irish Ice Sheet after roughly 35,000–32,000 years ago, with especially substantial expansion from about 31,000 to 26,000 years before present and its greatest overall volume later, around 23,000 years ago. Those are modelled chronological phases, not sharply dated Irish turning points.

Around the notional year 31,675 BCE, parts of Ireland may have been entering a period in which snowfields and local ice masses became increasingly significant, while other districts still retained ice-free ground.

The evidence is uneven. Organic-rich sediments beneath later glacial deposits at Derryvree and Greenagho in County Fermanagh preserve traces of earlier freshwater and wetland environments. Their dated ranges show that north-central Ireland contained ice-free landscapes during parts of the long interval before the final ice-sheet expansion. They do not demonstrate what happened across all Ireland, or even in Fermanagh, in one particular calendar year. Later glaciers scoured bedrock, shifted sediment and buried older surfaces beneath till, destroying much of the evidence that might otherwise have recorded this age.

Fermanagh's Buried Landscapes

Yet the Fermanagh deposits are important precisely because they preserve what the later ice did not wholly erase. At Derryvree, plant remains and sediments between tills indicate a cold, open wetland landscape with shallow freshwater conditions. At Greenagho, organic detritus from lake deposits beneath till similarly points to an interval when water, vegetation and sediment accumulated before renewed glaciation. These archives are not snapshots. A pollen grain, seed, moss fragment or layer of silt may represent years of deposition, and each stratigraphic layer has been subject to disturbance, dating uncertainty and interpretation. Nevertheless, together they make an essential correction to the image of an eternally frozen Ireland: before maximum glaciation, parts of the island supported waterlogged, tundra-like habitats.

Treeless does not mean lifeless. Cold-stage vegetation in Ireland is reconstructed from pollen, plant macrofossils and comparison with better-preserved north-west European sequences. Sedges, grasses, dwarf shrubs, mosses and hardy flowering plants could occupy marshes, floodplains and exposed ground, varying with drainage, wind exposure and season. The ground may have been seasonally frozen in places. Meltwater and frost action continually reworked slopes and valley floors. Woodland, farming fields and familiar hedgerow landscapes lay far in the future; even the coastlines and river mouths of modern Ireland cannot simply be projected backwards onto this changing terrain.

Castlepook and the Animal Record

The richest direct evidence for Ireland's late Pleistocene mammals comes from caves, especially Castlepook Cave near Doneraile in north County Cork. Excavations undertaken chiefly between 1904 and 1914 recovered a vast bone assemblage. Much was later lost or dispersed, and the surviving collection comes from antiquarian excavation rather than modern, fully recorded stratigraphic methods. That sharply limits what can be claimed. A cave collection is an accumulation across time, not a census of animals alive together on one day.

Even so, Castlepook demonstrates that Ireland was reached by a striking range of mammals during Marine Isotope Stage 3. The assemblage has included reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These species did not necessarily share precisely the same habitat or date. Some were visitors, some prey, some predators and some may have been brought into the cave by carnivores or washed in with sediments. The presence of spotted hyaena is especially revealing: caves could serve as carnivore dens and bone-accumulation sites, not merely shelters awaiting human occupants.

For the approximate period represented by 31,675 BCE, reindeer are particularly evocative but should not be romanticised into evidence for a settled hunting society. Reindeer favour open, cold environments and their remains support the broader picture of grassland, tundra and wetland mosaics. Mammoth and giant deer indicate that sizeable herbivores could enter Ireland during suitable phases; wolves and hyaenas reveal predators within the same wider food web. The island was therefore not biologically empty. But neither does the faunal record show stable herds in every county, a reliable seasonal route through Cork, or a fixed carrying capacity for people.

The Human Question

A reindeer femur from Castlepook has made this remote period newly significant for Irish prehistory. Its radiocarbon age has been reported as approximately 33,000 years old, and a deep incision has been interpreted as consistent with a cut made by a sharp stone tool during carcass processing. If that interpretation is upheld, it may represent the earliest evidence of human activity in Ireland: a fleeting encounter between people and a reindeer in the late Pleistocene.

That possibility must remain separate from what has been demonstrated. The bone was recovered from an old cave collection, not from a sealed occupation floor. A radiocarbon result dates the animal's death within a statistical range; it does not itself date the incision, identify where the animal was killed, or prove who brought it to the cave. Castlepook has not yielded a securely associated stone-tool assemblage, hearth, dwelling, burial, human skeleton, art panel or repeated domestic refuse of comparable age. Recent work has also shown that several radiocarbon determinations obtained from Irish cave bones in the 1990s require reassessment because improved pretreatment can produce substantially older results.

The proper conclusion is cautious but consequential. Ireland may have been visited by Upper Palaeolithic hunter-gatherers around this broad period, perhaps moving in very small groups and exploiting animal resources when local conditions permitted. It is not possible to identify their language, ancestry, social organisation or cultural tradition from the Irish evidence. Continental Europe possessed diverse Upper Palaeolithic populations and technologies, but no diagnostic Irish artefacts allow Castlepook to be assigned securely to a named archaeological culture. Nor can a single marked bone establish permanent settlement or continuous occupation.

No Politics, No Proven Trade

Political affairs, diplomacy and formal warfare cannot be recovered for Ireland at this horizon. There were no known Irish kingdoms, borders, chiefs, treaties or institutions, and no evidence for formal religion, monuments, writing or learned traditions. Nor is there evidence for farming, livestock, pottery, metalworking or trade networks within Ireland. These are not gaps to be filled with imaginative narrative; they are absences in the surviving record.

If people did make temporary incursions, everyday life would have depended on mobility, detailed environmental knowledge and access to meat, fat, hides, bone and fuel. Such statements are informed comparisons with Upper Palaeolithic hunter-gatherers elsewhere, not direct observations of an Irish camp. The sea and ice between Ireland, Britain and continental Europe also demand caution. Sea level, ice loading and crustal movement altered the geography of the Irish Sea, but there is no simple, universally accepted land-bridge map for this exact period. Any movement of animals or people occurred through a changing and poorly resolved landscape, potentially involving sea ice, islands, coastal corridors or stretches of water.

The Evidence's Long Afterlife

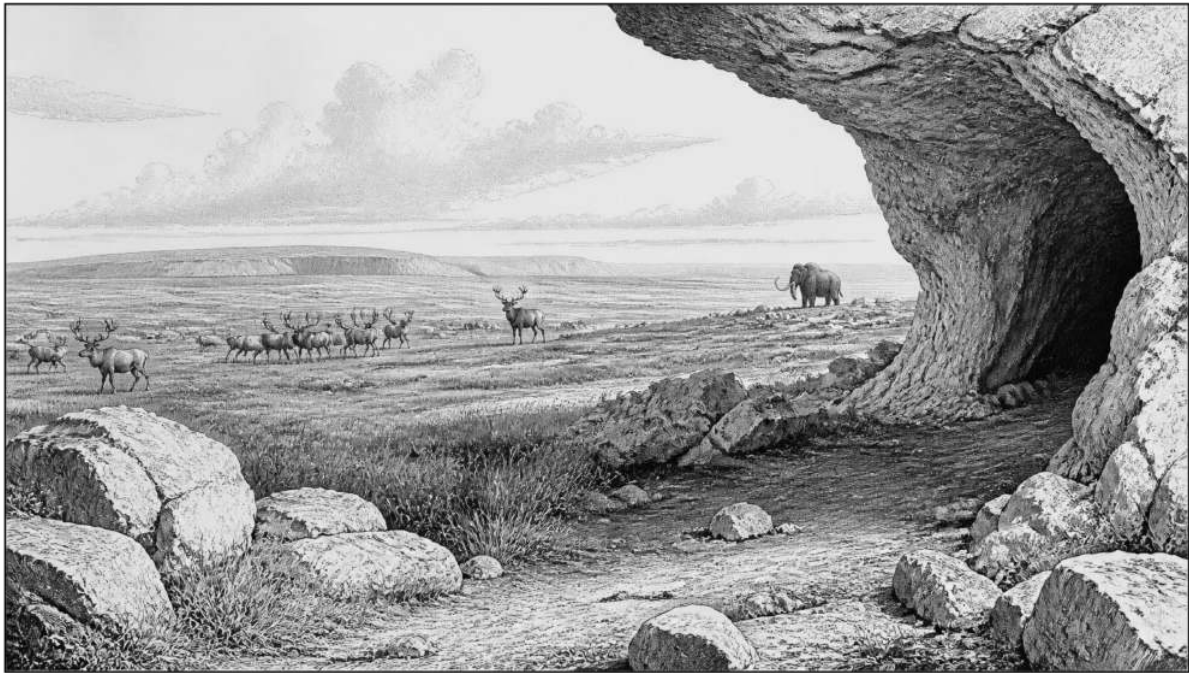
The principal historical development visible around 31,675 BCE is environmental rather than political: Ireland stood near the threshold of the last great ice-sheet expansion. Its habitats were changing, its animal populations were intermittent and mobile, and the ground that might have preserved human traces was vulnerable to later glacial erosion. The caves of Cork and the buried sediments of Fermanagh provide rare, imperfect windows through that loss.

For that reason, the story of this year is not one of a known settlement, battle or ruler. It is the story of evidence at its limit. A wetland layer beneath a drumlin, a cave bone gathered by a carnivore, a radiocarbon range revised by improved chemistry, and one contested incision on a reindeer femur together illuminate an Ireland that was cold, open and ecologically active. They also set a clear standard for interpretation: fascinating possibilities are not the same thing as established history.

Chapter 027 of 100

31674 BCE

Cork's Mammoth-Steppe Mosaic^[27]



The label 31,674 BCE cannot identify an event in Ireland in the way that a medieval or modern year can. It is a retrospective conversion of a calendar scale, not a date used by people then, and no Irish deposit can presently be assigned to that individual year. In archaeological terms, it falls broadly about 33,600 calibrated years before present, within Marine Isotope Stage 3 (MIS 3), a highly variable phase of the last Ice Age. The responsible approach is therefore to describe the evidence from dated ranges surrounding this point, and to separate what that evidence demonstrates from what it may suggest.

For Ireland, the central evidence is environmental and zoological rather than historical. There are no known settlements, named peoples, structures, graves, hearths or securely stratified stone-tool assemblages that can be dated specifically to this moment. The island's subsequent glaciation also destroyed, buried and rearranged much of the earlier landscape. Yet cave deposits, animal bones, pollen-bearing sediments and geomorphological studies show that parts of Ireland supported an unexpectedly rich cold-stage ecosystem before the Last Glacial Maximum.

A Pre-LGM Island

At this broad date Ireland was in the Midlandian, the Irish term for the last glacial period, but it was not yet necessarily the uniformly ice-covered island of popular imagination. The full Last Glacial Maximum came later, broadly after c. 26,000 calibrated years before present, and ice-sheet growth was neither instantaneous nor geographically uniform. Exposure dating of upland landforms has been used to argue that parts of north-central Ireland remained ice-free until at least about 34,000 years ago. Other reconstructions show that the British–Irish Ice Sheet subsequently expanded dramatically, reaching the Atlantic shelf west of Ireland only much later in the glacial cycle.

That distinction matters. Around the broad horizon represented by 31,674 BCE, Ireland was an unstable northern landscape at the edge of changing ice masses, not a settled green island separated by its modern coastline. Temperatures and precipitation could alter sharply over centuries and millennia. Permafrost, seasonal snow, wind-blown sediments, exposed rock and wet ground are all more appropriate elements of the picture than forests, peatlands or familiar pasture. However, conditions varied by region, altitude and season; a single phrase such as “frozen Ireland” conceals as much as it explains.

The sea was also lower than today because large volumes of water were locked in continental ice. Ireland’s shore lay farther from many present coasts, and the Irish Sea basin had a different geography. This would have changed routes available to animals and potentially to people. It does not, by itself, prove a continuous dry-land bridge from Ireland to Britain or continental Europe at this particular date. The existence, duration and passability of routes depended on shifting sea level, ice position, channels and local terrain.

The Castlepook Faunal Record

The most important Irish locality for this period is Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near Doneraile in north County Cork. Excavations from the late nineteenth and early twentieth centuries recovered an exceptional quantity of bones from its limestone passages. The assemblage includes mammals associated with cold, open habitats: woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming and Norwegian lemming. Spotted hyaena is especially significant. Its presence establishes that Ireland’s fauna was not merely a small, isolated survival of hardy herbivores, but included large predators and scavengers within a functioning food web.

Such a list should not be mistaken for a census of animals standing together in one Cork valley in 31,674 BCE. Cave collections accumulated over long spans. Old excavators did not record contexts to modern standards; deposits were disturbed in places, and bones from different episodes could be mixed. Furthermore, modern re-dating has shown that some earlier radiocarbon determinations on Irish cave bones were substantially too young because advances in sample preparation can remove contaminants more effectively. Castlepook is consequently powerful evidence for an Ice-Age fauna in Ireland, but it must be read specimen by specimen rather than as a perfectly sealed snapshot.

The revised dates nevertheless place important elements of the southern Irish fauna within MIS 3, before the Last Glacial Maximum. Research has suggested that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years before present, while other species persisted into later phases. Their histories were not identical. Animals colonised, withdrew, died out locally or returned as climate, vegetation and access changed. Ireland’s Pleistocene fauna was therefore dynamic, and its apparent gaps may reflect both real ecological absence and the uneven survival of evidence.

Open Ground and Seasonal Movement

Animal remains and palaeoenvironmental sequences together point towards predominantly open vegetation: a mosaic of grasses, sedges, dwarf shrubs, herbs and patches of wet ground, with little or no closed woodland. In northern Ireland, organic beds preserved beneath later glacial sediments at sites including Derryvree near Maguiresbridge retain pollen, plant macrofossils and freshwater evidence from

earlier cold-stage intervals. These deposits demonstrate the value of small, protected basins in recovering landscapes lost elsewhere to ice erosion. They also warn against treating all of Ireland as environmentally identical.

Reindeer were well suited to mobile use of a seasonal, treeless environment; lemmings and Arctic fox reinforce the evidence for cold open country. Mammoth and giant deer indicate that sufficient plant productivity existed, at least in favourable seasons and districts, to support very large herbivores. Wolves and hyaenas depended on prey, carrion or both. Caves may have served as dens, refuges, trap-like repositories or places into which bones were dragged, rather than as ordinary sites of animal death. Their contents show ecological relationships, but cannot reveal every migration route or population size.

There was no agriculture. No crops, livestock, fields, houses, pottery, metalwork or managed woodland can be attributed to Ireland at this date. “Economy” is therefore best understood ecologically: the movement of animals, the availability of plant foods and the seasonal distribution of shelter, water and carcasses. Any human visitors would have depended on hunting, scavenging, gathering and transported supplies. There is no evidence for permanent occupation, stored harvests, exchange networks, ports or a resident population comparable with the Mesolithic communities securely documented many millennia later.

The Reindeer Femur Question

A single object has made this era unusually important in debates over the Irish Palaeolithic: a reindeer femur from the Castlepook material bearing a deep linear mark. Ruth Carden has interpreted the modification as a cut or chopping mark made on fresh bone by a sharp stone tool. The bone has been publicly connected with an age of roughly 33,000 years ago, and this interpretation has been presented as possible evidence that people processed reindeer in Ireland during the Ice Age.

If the mark is human-made and the specimen’s chronological association is upheld, its significance is considerable. It would show an episode of human activity far earlier than the island’s formerly accepted archaeological record, and broadly close to the chronological world evoked by this entry. It could imply that Upper Palaeolithic people reached Ireland while cold-stage fauna were present. Processing a carcass might have supplied meat, marrow, hide, sinew or bone. But it would demonstrate an encounter, not a village, a people’s name, a territory or an unbroken settlement history.

The limits are equally important. The femur derives from an old cave collection rather than a modern excavation of a sealed occupation surface. No associated hearth, stone-tool collection, dwelling, burial, butchered assemblage or repeated sequence of visits of equivalent age has been securely published from Castlepook. Bone surfaces can be altered by carnivores, trampling, sediment movement, excavation and curation, so marks require microscopic and contextual assessment. For this reason, the most careful description is *possible early human presence or visitation*, not proof of a settled Irish Upper Palaeolithic population.

No Politics, No Recorded Beliefs

Political history cannot responsibly be written for Ireland in 31,674 BCE. There is no evidence for chiefs, kingdoms, warfare, diplomacy, laws, ethnic names or territorial borders. Nor is there evidence for religious institutions, formal burial practice, monuments, visual art or teaching traditions on the island at

this time. The cave itself should not be called a sanctuary simply because it was a dramatic place later excavated for bones. Such claims would import expectations from far later prehistoric societies into a period for which the material record is exceptionally thin.

That absence is itself historically meaningful. Ireland's human story was not a smooth march from Ice-Age hunters to later farmers. The future Last Glacial Maximum would transform or obliterate many habitable areas, and any earlier visitors need not have left descendants or a continuous cultural tradition. The next securely better-attested episodes of human activity belong much later, after climatic improvement, and the familiar Mesolithic settlement record begins only in the early Holocene.

What This Moment Can Tell Us

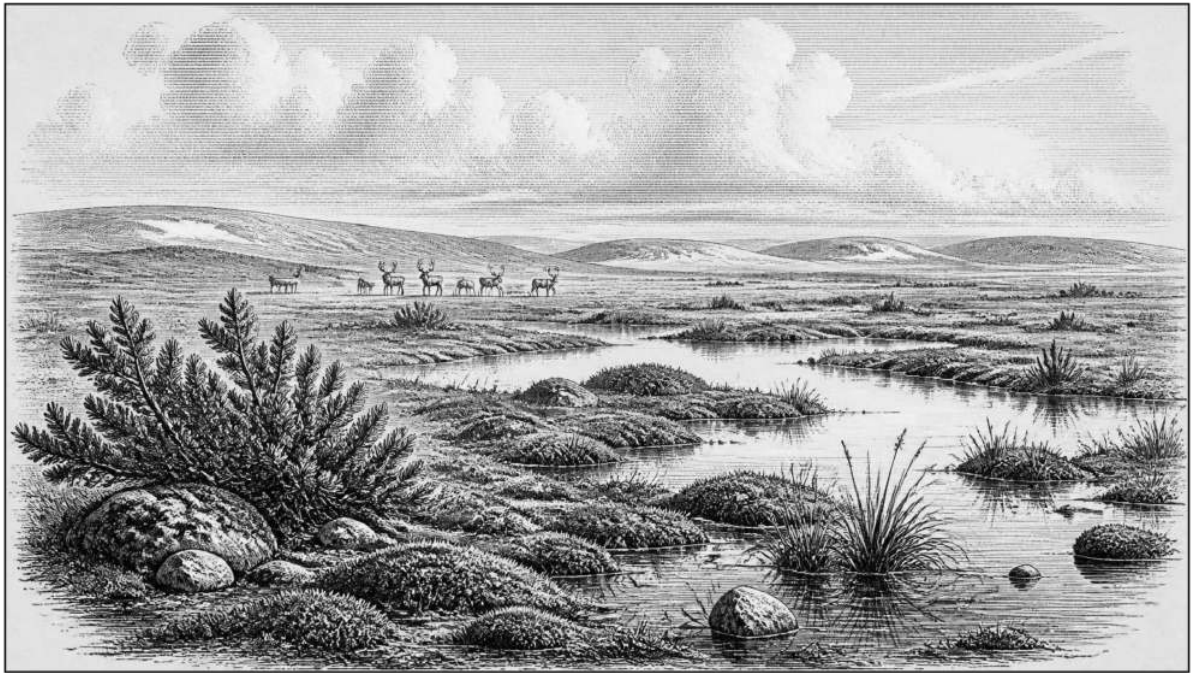
The best-supported image of Ireland around this calendrical point is thus a cold, open and changing island or near-island landscape, still capable in some places of sustaining large grazers, predators and scavengers. North Cork's caves preserve a fragmentary record of that world: mammoth, reindeer, giant deer, hyaena and smaller cold-adapted animals, accumulated through natural processes over long periods. Subglacial and inter-till sediments elsewhere preserve complementary botanical traces. Together they establish environmental possibility, not a day-by-day narrative.

Modern calendar-year precision is unavailable. A date written as 31,674 BCE is useful for ordering an archive, but calibrated ranges, laboratory uncertainty, changing radiocarbon calibration curves and disturbed deposits set the true resolution. The archaeological lesson is not that nothing happened in Ireland. Rather, it is that the surviving evidence allows only a narrow conclusion: before the Last Glacial Maximum, Ireland intermittently supported a diverse Ice-Age fauna, and one contested reindeer bone may preserve the faintest sign that people briefly entered that world.

Chapter 028 of 100

31673 BCE

The Maguiresbridge Freshwater Lens^[28]



31,673 BCE is not a year that can be recovered from Ireland's archaeological record in the ordinary historical sense. No Irish calendar, inscription, settlement sequence or human biography can be fixed to it. The number is a modern conversion: it corresponds roughly to 33,623 years before AD 1950, the conventional 'present' used in radiocarbon reporting. At this depth of time, radiocarbon results require calibration and carry substantial ranges. The responsible subject is therefore not an event in one named year, but Ireland during a broad Late Pleistocene interval that includes this notional date.

That interval belongs to Marine Isotope Stage 3, a climatically variable part of the last Ice Age. Ireland was moving towards the much more extensive ice cover of the Last Glacial Maximum, but it was not simply a uniformly frozen island. Geological evidence shows that parts of the country, including the south, remained ice-free for long periods before the major later advance. Conditions changed across centuries and millennia, and varied between coast, lowland, upland and the margins of ice. Any picture of 31,673 BCE must consequently be a cautiously drawn regional reconstruction rather than a national snapshot.

A Date Range, Not a Dated Event

The most relevant Irish chronological anchor lies at Derryvree near Maguiresbridge, County Fermanagh. Road cutting through a drumlin exposed freshwater silts and fine sands sealed between two distinct layers of glacial till. The organic deposit produced a radiocarbon determination of 30,500 years before present, with a large laboratory uncertainty. Published calibration places its possible age broadly around 36,900–31,700 calibrated years before present. That range embraces the modernly calculated position of 31,673 BCE, but it emphatically does not identify a particular season, generation or year.

This distinction matters. A date from a deposit measures the age of organic material within a layered environmental record; it does not announce that a single episode occurred everywhere in Ireland at once. Nor does the wide calibrated range mean that Derryvree remained unchanged throughout it. Sediment accumulated over time, plants grew and decayed, pools shifted, and cold-climate communities responded to fluctuating weather. The Derryvree sequence is valuable precisely because it offers a rare, securely located glimpse beneath later ice, not because it supplies annual news from prehistoric Fermanagh.

Wet Ground Beneath a Drumlin

The evidence from Derryvree supports an open, treeless and periglacial landscape. Pollen was poorly preserved, but the surviving record is dominated by herbaceous taxa associated with tundra-like vegetation. Plant macrofossils include mosses, while the broader assemblage has been interpreted as a muskeg: wet, peaty ground with pools, abundant plant matter and mossy margins. Sedges, grasses, herbs and juniper are among the plants used to reconstruct the surrounding cover. Such a landscape was not a barren white desert. It contained water, vegetation and ecological niches, though its growing season was short and its winters severe.

The word ‘tundra’ should not be made more precise than the evidence allows. It describes the open, cold-adapted character of the vegetation, not a complete modern Arctic scene transplanted unchanged to Ireland. Derryvree was one locality in south Fermanagh, and its freshwater basin had its own hydrology. Still, the combination of stratigraphy, plant remains and invertebrate evidence demonstrates that at least some Irish lowland ground could sustain wetlands and sparse terrestrial vegetation during this cold phase. It also demonstrates that later ice advanced over and preserved, rather than wholly erased, portions of that older landscape.

At the scale of the island, major regional change was under way. Ice-sheet reconstructions indicate that southern Ireland was ice-free before the main Last Glacial Maximum advance, while deposits along the south coast show that subsequent glaciation became extensive after roughly 24,000 calibrated years before present. The future of the Derryvree ground was therefore already implicit in its setting: organic silt lay between tills because glacier ice had passed before its formation and would pass again afterwards. Around the notional date, Ireland was an unstable North Atlantic edge-land, not a settled landscape on a stable climatic trajectory.

The Cave Record in North Cork

Castlepook Cave, near Doneraile in County Cork, provides the other major body of relevant evidence. Its chambers yielded Ireland’s richest known assemblage of vertebrate remains from the period leading up to the Last Glacial Maximum. Recorded animals include woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, fox, Arctic fox and lemmings. These finds show that Ireland formed part of a wider north-west European cold-stage ecological world, with animal movements possible during periods of lowered sea level and altered coastlines.

Yet Castlepook must not be read as if every listed animal stood together outside the cave in 31,673 BCE. The bones derive from different chambers, sediments and episodes; some were accumulated or altered by carnivores, water and earlier excavation. Modern radiocarbon re-dating has shown that several older determinations from southern Irish caves were substantially too young, underlining the difficulty of

working with aged museum collections and disturbed cave deposits. Castlepook's dated fauna spans a very long period, broadly from more than 45,000 to about 20,000 years before present. It is an archive of changing animal communities, not a single frozen moment.

Spotted hyaena are especially instructive. Their presence indicates that the cave could serve as a carnivore den or bone-accumulation place, as well as a geological trap and later archaeological repository. Tooth-marked and transported remains can reveal the behaviour of predators and scavengers, but they complicate simple claims about hunting or human occupation. Mammoth, reindeer and giant deer likewise establish that large herbivores reached parts of Ireland during the broader period; they do not prove their precise numbers, seasonal routes or coexistence at Derryvree. The strongest conclusion is ecological connectivity, not a detailed prehistoric census.

A Possible Human Trace

A reindeer femur from Castlepook has made this time unusually important for Irish archaeology. Re-examined material has been publicised as bearing a deep mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during butchery, while the bone itself has been reported as about 33,000 years old. If that interpretation is sustained, it is potentially the earliest evidence that people handled an animal in Ireland, far earlier than the long-recognised post-glacial record.

Its limitations are equally important. The bone did not come from a modernly excavated occupation floor with a sealed hearth, stone-tool assemblage and associated food remains. It was recovered from a cave collection whose depositional histories are complex. The scientific date applies to the animal's death, not automatically to the exact moment when the mark was made, and identifying a mark as human butchery is a specialist interpretation rather than a self-evident fact. There is no securely demonstrated dwelling, burial, workshop, art, durable camp or continuous Upper Palaeolithic population in Ireland from this broad period.

It would therefore be irresponsible to write of an Irish tribe, a named people or permanent settlers in 31,673 BCE. The most that can presently be said is that one or more human visitors may have reached the island and processed reindeer during a broad interval around the early thirty-third millennium BCE. If people were present, they would have been mobile hunter-gatherers operating within a larger north-west European world, not inhabitants of a known Irish polity. The evidence does not tell us their language, ancestry, social identity, clothing, beliefs or route of travel.

What Cannot Yet Be Written

There are no political affairs to report. No evidence identifies rulers, territories, assemblies, alliances, diplomacy, warfare or collective institutions on the island at this date. Nor is there evidence for farming, herding, metalworking, trade networks, towns, monuments, writing or formal religious practice. The absence of such evidence does not mean that any human visitors lacked social relationships, knowledge or spiritual ideas; it means that archaeology has not recovered material capable of describing them responsibly in Ireland.

Everyday life can be approached only indirectly, through environment and animal remains. A visitor able to butcher a reindeer would have needed cutting technology and practical knowledge of carcass processing, but the specific tools have not been found at Castlepook. The animals themselves would have been part of a difficult world of cold exposure, seasonal scarcity and dangerous predators. Freshwater

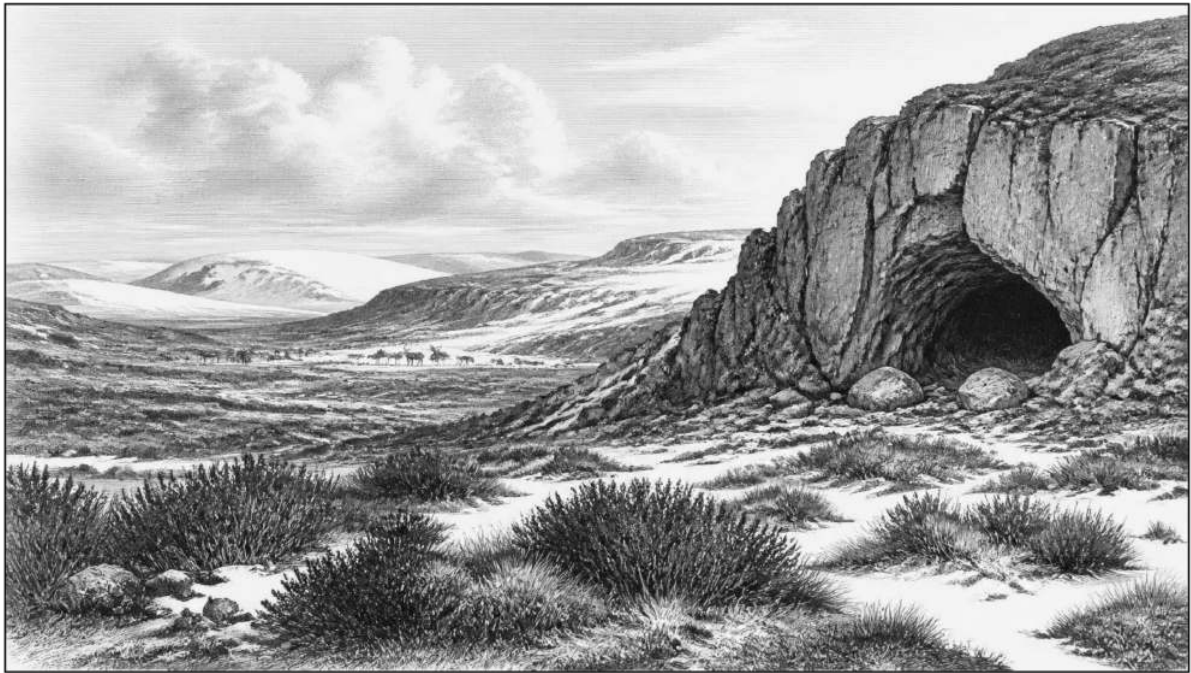
basins such as Derryvree offered water and plant-rich wetland habitats; open ground may have aided the movement and visibility of grazing animals. These are ecological possibilities, not a recovered itinerary or camp routine.

The chief historical development illuminated around 31,673 BCE is thus neither a battle nor a dynasty, but the survival of evidence. Derryvree's freshwater silts show an ice-free, cold and living Irish landscape within a period of glacial instability. Castlepook's faunal archive shows that large mammals and carnivores entered that landscape across many millennia. The contested reindeer femur raises the possibility of a fleeting human encounter with it. Together they replace an older image of wholly empty Ice-Age Ireland with a more careful one: a changing northern environment, intermittently habitable for animals, and perhaps briefly visited by people, whose traces remain exceptionally rare.

Chapter 029 of 100

31672 BCE

Castlepook's Reindeer Incision^[29]



The label 31,672 BCE is a modern, proleptic-calendar convenience, not a date that anyone living in Ireland could have known or recorded. No written calendar, named individual, settlement sequence or historical event lets us isolate a single year so far back. The responsible scale is the Late Pleistocene, within Marine Isotope Stage 3: a climatically volatile interval of the last Ice Age. In calendar terms, this notional year lies roughly 33,600 years before AD 1950, but archaeological and environmental evidence must be discussed in broad, calibrated ranges rather than as an annual chronicle.

For Ireland, the closest and most important evidence is found in the limestone caves near Doneraile, north County Cork, especially Castlepook, long known as Mammoth Cave. There, an old cave collection has supplied fossil bones from a changing Ice Age fauna and, more recently, a reindeer femur bearing a deep incision interpreted as a stone-tool cut made during carcass processing. Public heritage accounts place the bone at about 33,000 years old, often rendered as c. 31,000 BC. That makes it directly relevant to the period represented by 31,672 BCE, but it is not proof of an event in that precise year.

A Landscape Between Ice Advances

Ireland was not the familiar green, wooded island of later millennia. It lay in a north-west European world repeatedly altered by sharp climatic swings, falling sea levels, advancing ice and periods of relative amelioration. The great Last Glacial Maximum was still ahead: major British–Irish Ice Sheet growth and its maximum extent belong broadly to the later span between about 31,000 and 20,000 calibrated years before present, with important regional variations. At the approximate time considered here, ice was expanding and conditions were severe, but the island was not necessarily engulfed by a single uniform ice sheet from coast to coast.

This distinction matters. Geological evidence shows that Irish glaciation was episodic and spatially uneven. Some uplands and offshore sectors preserve evidence of later ice movement; other deposits and cave faunas demonstrate that, during portions of the wider pre-maximum interval, terrestrial animals could occupy parts of the island. We should therefore picture neither an ice-free paradise nor an unbroken white wilderness. Southern Ireland may at times have contained open ground, frost-shattered slopes, sparse vegetation and sheltered valleys, while glaciers and perennial snow affected other areas. The precise local conditions at Doneraile in a particular season or year cannot be recovered.

Sea level was much lower than today because vast quantities of water were locked in continental ice sheets. The Irish Sea and Celtic Sea basins consequently had very different coastlines, with broad areas now submerged forming exposed or shallow landscapes. Yet lower sea level does not automatically mean a walkable land bridge to Ireland. Research on Irish colonisation stresses that Ireland was already an island during the relevant late-Pleistocene span. If people reached it, they had to negotiate water, however narrowed or altered the crossings may have been, and any route would have changed as ice and sea levels shifted.

The Castlepook Faunal World

Castlepook is valuable because caves can preserve bones when open-air camps, soil surfaces and riverbanks have been erased by frost, water and later glaciation. The cave assemblage includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Taken together, these animals indicate an open, cold-stage environment with a mosaic of grassland, herb-rich steppe-tundra and more sheltered patches. It was a landscape capable of supporting large grazing animals and the predators or scavengers that followed them.

That list must be read carefully. It does not mean every species grazed together outside the cave in 31,672 BCE. Cave deposits commonly accumulate over long periods. Hyenas and other carnivores can carry bones into dens; water can move material; sediment can be disturbed; and nineteenth- and early twentieth-century excavations did not preserve the fine stratigraphic records now expected. Direct radiocarbon dates have shown that bones once assumed to be comparable in age may in fact be separated by thousands of years. Castlepook is thus an archive of several episodes, not a frozen photograph of one day.

Even so, the fauna is important evidence for regional change. Reindeer, cold-adapted lemmings and Arctic fox point to treeless or nearly treeless conditions. Mammoth and giant deer imply enough forage to sustain large herbivores, although their presence at the site need not identify their exact population sizes or seasonal movements. Spotted hyaena is especially revealing: Ireland's evidence for the species is concentrated at Castlepook, and its occurrence within the broad range of roughly 45,000 to 30,000 years ago demonstrates that the island was, at least intermittently, connected to wider ecological movements across the north-west European margin.

The Mark on a Reindeer Bone

The reindeer femur is the most consequential human clue for this period. It was recovered from Castlepook's antiquarian excavations and later examined within renewed study of Ireland's cave-bone collections. Ruth Carden has interpreted its broad, deep mark as consistent with cutting or chopping fresh

bone using a sharp stone implement. County Cork's heritage publication accordingly identifies it as a Palaeolithic reindeer bone from c. 31,000 BC and presents it as evidence that Stone Age hunters butchered an animal in the Doneraile region.

If this interpretation is sustained, it is a major revision to Irish prehistory. It would indicate a human visit to Ireland tens of millennia before the well-established post-glacial record, and far earlier than the terminal-Pleistocene bear bone from Alice and Gwendoline Cave in County Clare, dated to about 12,810–12,590 calibrated years before present. The reindeer bone would fit a wider European setting in which *Homo sapiens* groups were established across Britain and continental Europe and possessed sophisticated stone technologies, hunting knowledge, clothing and far-reaching social connections.

But the claim has clear limits. The cut does not identify the person who made it, their language, ancestry, sex, community, artistic tradition or route into Ireland. No associated hearth, stone-tool assemblage, shelter floor, burial, food store or repeatedly occupied camp of comparable age has yet been securely excavated at Castlepook. Nor can the bone establish whether a party killed the reindeer, scavenged it, processed it elsewhere, entered Ireland once, visited repeatedly, or formed a lasting population. The dated animal and the act of cutting are closely connected by interpretation, not a written testimony.

People Without a Political History

There can be no responsible account here of Irish rulers, tribes, diplomacy, war or territorial government. Such institutions leave no evidence at this date, and it would be misleading to project later ideas of Ireland, ethnicity or nationhood into the Upper Palaeolithic. If people were present, they were probably members of small, mobile hunter-gatherer groups whose social organisation was flexible and whose survival depended on detailed knowledge of animals, weather, terrain and materials. That is an inference from comparable Upper Palaeolithic societies elsewhere, not a fact directly observed at Castlepook.

Conflict is equally undocumented. Hunting large animals could have been dangerous, and carnivores competing for carcasses or shelter made the landscape hazardous. Yet neither danger nor competition is evidence of warfare. Similarly, no diplomacy or trade can be demonstrated in Ireland. The very possibility of arrival across water or exposed coastal lowlands suggests contact with populations beyond the island, but evidence for exchange goods, alliances or regular travel remains absent. The key historical point is mobility: Ireland was part of a larger ecological zone, even if its human connections were intermittent.

Daily Life, Learning and Belief

The reindeer incision offers a narrow glimpse of everyday practice: animal bodies were valuable sources of meat, fat, hide, sinew and bone, and cutting a limb was part of skilled work rather than a random action. A hunter or butcher would have needed sharp stone edges, anatomical knowledge and the ability to operate in cold conditions. Reindeer hides could have served as clothing, bedding or coverings; sinew could be bound into tools or equipment. These are plausible uses documented among Palaeolithic communities elsewhere, but none can be demonstrated from this single Irish bone.

There is no securely dated Irish evidence for art, personal ornaments, ritual places, graves, music, formal teaching or religious belief at this time. It would be wrong to turn a cave into a shrine simply because it is dramatic to modern eyes. Caves at Castlepook were used by animals as well as people, and the bone record is shaped strongly by carnivore activity. Nevertheless, the skills required to make,

maintain and use stone tools imply learning passed between people. The archaeological silence is not proof that culture or belief were absent; it is evidence that they have not survived or been identified in Ireland.

Economy at the Edge

There was no farming, permanent village economy, metalworking, market system or recognisable Irish trade network. The economy, if humans were present, was one of mobile foraging and hunting within a cold, fluctuating environment. Reindeer were particularly significant because herds could provide concentrated resources but might also move beyond reach. Large herbivores and small game, plant foods available seasonally, and perhaps birds or fish in suitable places could have supplemented a diet. The evidence does not permit a menu for Castlepook, only the conclusion that animal resources mattered greatly.

Settlement was probably ephemeral. A cave may have offered shelter, but Castlepook's deposits cannot yet prove it was a human dwelling rather than a carnivore den receiving discarded or transported bones. A brief hunting stop, a carcass-processing episode or a succession of visits are all more defensible possibilities than a permanent settlement. The later growth of ice would transform this already difficult world, eroding many traces of any occupation and creating a profound break between these possible Palaeolithic visitors and the far better attested communities of the post-glacial era.

What Can Be Said for This Date

Around the broad horizon represented by 31,672 BCE, Ireland belonged to an Ice Age frontier of open terrain, shifting coasts, cold-adapted animals and climatic uncertainty. Castlepook Cave supplies the central evidence: a rich but time-mixed faunal archive and a reindeer femur whose incision may record human butchery around c. 33,000 years ago. It supports the possibility—indeed, the serious archaeological claim—of an Upper Palaeolithic human presence in Ireland. It does not yet support a story of a named people, a settled society or a year-specific occurrence. The outstanding task is to find securely stratified sites, stone tools and independently dated contexts capable of turning that provocative mark into a fuller history.

Chapter 030 of 100

31671 BCE

Derryvree's Denekamp Wetland^[30]



31,671 BCE is a modern label, not a year that anyone in Ireland could have recognised. There were no calendars, written records, named rulers or political communities whose actions can be assigned to this point with annual precision. Converted into archaeological convention, it lies about 33,620 calendar years before present, where “present” means 1950. That conversion is useful for orientation, but it must not be mistaken for a precisely dated Irish event. At this depth in time, radiocarbon results have to be calibrated, their ranges are often broad, and deposits from separate places may represent very different centuries.

The responsible history of Ireland around this nominal year is therefore an environmental and archaeological one. It belongs to the Late Pleistocene, during Marine Isotope Stage 3, a long and climatically variable phase of the last Ice Age. The island was not yet simply the ice-covered Ireland familiar from maps of the later Last Glacial Maximum. Nor was it a stable refuge. Ice margins, sea level, vegetation and animal ranges changed repeatedly, while later glaciers destroyed or buried much of the evidence. What survives comes principally from rare protected deposits: freshwater silts beneath drumlins in Fermanagh, cave deposits in north Cork, shells on the western coast, and landforms that record the advance of ice.

A Range Rather Than a Moment

The closest securely relevant Irish environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed fine freshwater sands and organic silts enclosed between two sheets of glacial till. The lower till records an earlier advance of ice; the silts accumulated after that ice had gone; the upper till shows that renewed glaciation later crossed the site. Organic material from the

intervening deposit produced a radiocarbon age of about $30,500 \pm 1,200$ radiocarbon years before present. Published calibration places it broadly between about 36,900 and 31,700 calendar years before present, approximately 34,950–29,750 BCE.

31,671 BCE falls within that wide calibrated interval, but it cannot be extracted from it as a discrete episode. The Derrynree sediments do not tell us what happened in one season, let alone in one numbered year. They establish something more valuable and more defensible: during part of the later Middle Midlandian cold stage, north-central Ireland had an ice-free freshwater landscape before a later ice advance sealed it beneath till. Similar evidence from Greenagho in Fermanagh, and from other northern sites where organic beds lie between glacial deposits, reinforces the conclusion that glaciation was episodic rather than a single uninterrupted blanket over all Ireland.

The name “Denekamp” is often used in north-west European discussions for a relatively milder interval within the late part of Marine Isotope Stage 3. It can provide a broad continental comparison for the age of Derrynree, but it should not be treated as a precise Irish historical period with fixed borders or dates. Irish sequences are sparse, regional and difficult to correlate exactly. The most prudent description is that Derrynree preserves an interlude of biological activity within a cold and changing glacial world.

Wet Ground, Open Sky

Derrynree offers the clearest picture of what such an Irish landscape could have looked like. Pollen, plant macrofossils, mosses and insect remains point to open, largely treeless vegetation. This was not the familiar Ireland of oak woods, hazel scrub, fields and hedges. It was a periglacial terrain of sedges, grasses, herbs, mosses and low shrubs, with wet ground, shallow pools and sluggish freshwater channels. A seed of bogbean, a plant associated with wet margins and standing water, is among the particularly revealing finds. Juniper and dwarf shrubs may have occupied drier patches, but the evidence does not support extensive local woodland.

Such a setting is often compared with tundra or muskeg: waterlogged, organic-rich ground in which vegetation grew during a brief productive season and frost affected soils for much of the year. That does not mean a featureless wilderness. The wetland had ecological variety. Open water supported aquatic plants; mossy and sedgy margins sheltered insects; exposed ground offered grazing; and the different surfaces of pools, gravel, silt and turf created small habitats close together. Yet winters were severe, the growing season short, and wind exposure substantial. The landscape’s productivity was seasonal and precarious.

Regional conditions need not have been identical. Derrynree is in Fermanagh, while cave bones come chiefly from the limestone country around Doneraile in north County Cork. Its freshwater beds cannot serve as a weather report for every Irish valley, coast and upland. They do, however, disprove any simple image of uniformly permanent ice. In western Ireland, marine and glacial evidence also indicates major fluctuations in the Irish Ice Sheet before the later Last Glacial Maximum. The exact extent and thickness of ice at any particular date remain debated, but the broader pattern is clear: around this era Ireland was passing through an unstable phase before ice expanded more extensively in subsequent millennia.

The Cave-Bone World of North Cork

Castlepook Cave, also called Mammoth Cave or Doneraile Cave, supplies a striking southern counterpart. Excavated in the early twentieth century, it yielded a large and complicated collection of animal bones from passages later given names including Elephant Hall and Hyena Hall. Radiocarbon

dates from mammoth and spotted hyaena remains have placed important parts of its cold-stage fauna broadly around 34,000–35,000 radiocarbon years before present. Cave deposits accumulated over long periods and were disturbed by animals, sediment movement and early excavation, so the assemblage cannot be treated as one perfectly sealed community or one date.

Even so, its animals demonstrate that Ireland could support a remarkable cold-stage fauna. The list includes woolly mammoth, reindeer, giant deer, brown bear, wolf, spotted hyaena, Arctic fox, hare and lemmings. Some animals were herbivores living from the open vegetation; others were predators or scavengers exploiting carcasses. Gnawed bones show that hyaenas were active collectors. Castlepook was therefore not necessarily a place where every animal died naturally. A cave can be a den, trap, shelter, water-carried bone store and excavation archive at once.

This evidence illuminates everyday ecology rather than human society. Reindeer and giant deer suggest grazing opportunities; mammoths evoke wide-ranging herbivores on open ground; hyaenas and wolves point to an active carnivore guild. But absence is also informative. The Irish fossil record of this date is thin compared with contemporary areas of Britain and continental Europe. It cannot reliably measure animal abundance or establish that every species occurred everywhere on the island. What it establishes is connectivity: at intervals, Ireland was part of a wider north-west European zone in which cold-adapted animals could disperse, feed and reproduce.

A Single Mark and a Large Question

The most consequential possible human trace is a reindeer femur from Castlepook. It has been interpreted by its examiner as bearing a deep mark made on fresh bone by a sharp stone tool during butchery. County Cork's heritage service presents the object as evidence that Palaeolithic hunters processed reindeer in Ireland around 31,000 BCE. If that interpretation and its chronological association are sustained, it would extend evidence for human activity in Ireland dramatically earlier than the well-established post-glacial record.

Nevertheless, this is not a basis for inventing a settled hunting community in 31,671 BCE. No securely associated stone-tool assemblage, hearth, dwelling, occupation surface, burial or food-preparation area of this age has yet been recovered in Ireland. Nor does a marked bone prove permanent residence, a continuous population, or descent from any such visitors to later communities. The bone may indicate a brief incursion by highly mobile hunter-gatherers following animal herds; that is an interpretation, not a demonstrated social history. The cave's complex formation history makes caution especially necessary.

There is consequently no evidence for government, chiefs, warfare, diplomacy, territorial boundaries, agriculture, livestock, formal trade routes, monuments, organised religion or literacy in Ireland at this point. It would be misleading to fill those silences with assumptions borrowed from later prehistory. If people did visit, their economic activity may have centred on hunting, scavenging and processing animal carcasses with portable stone equipment. Beyond that, the material record does not responsibly allow us to reconstruct kinship, beliefs, language, ritual or political organisation.

Changing Ground and Vanished Shores

The principal regional development was environmental change. The landforms that define much of modern Ireland—drumlins, tills, moraines and glacially altered valleys—were being shaped over repeated advances and retreats, though not all at once and not necessarily at the precise point represented by this

modern date. Falling global sea level exposed more of the continental shelf than exists today, while ice loading and changing sea levels altered coastlines and drainage. Later glaciation eroded exposed surfaces and scattered earlier sediments, helping to explain why a buried wetland and a cave collection carry such disproportionate weight in the evidence.

For Ireland, then, 31,671 BCE is best understood not as a year of named events but as a window onto an Ice Age threshold. Derryvree preserves wet, open, living ground between episodes of ice. Castlepook preserves animals adapted to a very different Ireland from the later wooded island. The cut-marked reindeer femur raises the possibility that people entered that world, but it cannot yet support a detailed human narrative. The enduring historical lesson is methodological as much as environmental: at this distance in time, evidence can be vivid without being complete, and the honest account is one that keeps observation, calibrated range and interpretation carefully apart.

Chapter 031 of 100

31670 BCE

Derryvree's Silted Pool^[31]



“31,670 BCE” is a modern chronological label, not a date at which an event can be placed in Ireland. No written record, named individual, settlement, artefact assemblage or calendar-year occurrence survives from this point. At this depth of time, precision rests on scientific estimates with substantial ranges. The label corresponds very approximately to 33,620 years before AD 1950, but the best Irish evidence is dated in broad calibrated intervals rather than single years. The crucial environmental sequence at Derryvree, near Maguiresbridge in County Fermanagh, has produced calibrated ages of roughly 36,900–31,700 cal BP. It can therefore illuminate the world around this nominal year, but cannot identify conditions on one particular season, let alone one particular day.

An Interval Beneath a Drumlin

Derryvree is important because a road cutting exposed organic silts and fine sands trapped between two thick sheets of glacial till. The deposits were later incorporated into a drumlin: one of the elongated hills that now gives much of Fermanagh and neighbouring counties their characteristic form. The lower till records an earlier glacial episode, while the upper till belongs to a later expansion of the Irish ice sheet. Between them lies evidence of a period when water, plants and small animals occupied a low-lying hollow.

That evidence is more dependable than any picturesque reconstruction. Sediments tell archaeologists and geologists that there was standing or slow-moving freshwater; plant remains, pollen and insect evidence indicate vegetation; the enclosing tills show that this brief environmental archive was eventually overridden or sealed by ice-related deposits. The Derryvree sequence has traditionally lent its name to a “Derryvree Cold Phase”, but such labels are working subdivisions of Irish Quaternary stratigraphy, not proof that every part of Ireland experienced identical conditions at the same moment.

The date range also matters. Radiocarbon years are not calendar years, because atmospheric carbon-14 concentrations changed through time. Calibration curves convert laboratory measurements into calendar estimates, but at around 34,000 years ago the resulting ranges remain broad. The responsible conclusion is that Derryvree records part of Marine Isotope Stage 3, during the last glacial period, at or near the time represented by 31,670 BCE. It does not provide an annual chronicle.

Cold Water, Open Ground

The Derryvree organic beds point to a treeless, cold landscape with wet ground, pools and moss-rich vegetation: what earlier investigators described as muskeg-like terrain. This was not the wooded, hedge-divided Ireland familiar today. Trees were absent or extremely scarce locally, and the plant community was adapted to short growing seasons, frost, saturated soils and exposure. Insects from the sequence reinforce the impression of open, cold conditions around shallow water and abundant plant debris.

Such evidence should not be turned into a claim that Ireland was a single uniform tundra. Relief, drainage, distance from the sea, snow cover and the position of ice margins could all create regional variation. The Derryvree hollow was one particular environment in the north of the island. Yet it provides a powerful corrective to any assumption that every Ice Age scene was a barren desert of snow. Even in a harsh climatic phase, lowland waterbodies and their margins could sustain plant life and invertebrate communities.

South-western Irish cave records add another perspective. At Crag Cave in County Kerry, episodes of speleothem growth during Marine Isotope Stage 3 indicate intervals when liquid water could percolate through the limestone and annual conditions were less persistently frozen. The timings broadly echo the abrupt warm and cold oscillations recognised in Greenland ice cores. This does not mean that Ireland experienced Greenland's climate directly or uniformly. It means that Irish records, however fragmentary, preserve signs of a rapidly changing North Atlantic world rather than an unbroken, simple descent into maximum glaciation.

The Faunal Evidence

At Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, in north Cork, fossils establish that an impressive cold-stage fauna reached Ireland during the wider Marine Isotope Stage 3 interval. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena. Aghnadarragh near Lough Neagh has also yielded woolly mammoth remains and Ireland's only known musk ox material. These finds demonstrate that the island, or the landmass that later became the island, could support and receive large mammals during phases of the last glacial cycle.

They must nevertheless be handled with care. Cave deposits often accumulated over long periods. Bones can be moved by water, carnivores, roof collapse, excavation and later disturbance; fossils from differing ages may be close together in the same cave chamber. Modern redating has shown that several older radiocarbon determinations from southern Irish caves were too young, sometimes by many thousands of radiocarbon years. The revised work places important Castlepook fauna earlier in Marine Isotope Stage 3 and suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum.

It is therefore sound to say that reindeer, mammoth and carnivores belonged to the wider Irish late-Pleistocene record relevant to this era. It is not sound to place a particular herd at Derryvree in 31,670 BCE, or to imagine mammoths wading through its particular pool. The environmental sequence and the cave fauna complement one another; they do not form a photograph of a single landscape at a single instant.

Ice Sheet in Formation

The period falls before the full Last Glacial Maximum, when the Irish component of the British–Irish Ice Sheet attained its greatest extent. Recent synthesis of terrestrial and offshore evidence indicates that Ireland was largely ice-free until about 32,000 years ago, after which the last Irish ice sheet thickened and expanded. Its growth was not a single island-wide switch from green land to total ice cover. Different sectors advanced at different times, and the maximum extent in some offshore areas came substantially later, between roughly 30,000 and 22,000 years ago.

For people living far in the future, this ice would create many familiar Irish landforms: streamlined rock, tills, drumlins, eskers, moraines and meltwater channels. Around the nominal date in question, however, those forms were processes in motion or deposits yet to be laid down. The upper till at Derryvree is material testimony that the freshwater interval ended under renewed glacial conditions. Its burial is as historically significant as its biological content: it shows that the habitat was vulnerable to major environmental reorganisation.

Sea level was much lower than today, exposing broad areas of the continental shelf. Ireland was not yet isolated in the modern sense; later work places the final creation of an island between approximately 20,600 and 18,100 cal BP. But a lower sea level should not be simplified into an easy, continuous route from continental Europe. The routes across the Irish Sea basin, through Britain and across exposed shelves were shaped by watercourses, cold terrain, sea ice and shifting glaciers. Animal movement into Ireland was possible during suitable intervals, but its exact pathways remain an inference rather than an observed fact.

No Demonstrated Human Community

There is no secure evidence for people in Ireland around 31,670 BCE. No accepted stone-tool industry, hearth, dwelling, human bone, deliberate burial, rock art, ornament or unequivocally butchered animal bone belongs to this pre-Last Glacial Maximum horizon. That absence is central to the history of the period. Political affairs, diplomacy, warfare, religion, learning, trade and social institutions cannot responsibly be described, because none is evidenced for Ireland at this time.

It is possible that Upper Palaeolithic hunters occasionally moved through regions of Britain and north-west Europe occupied by the same broad range of cold-adapted mammals. The existence of fauna in Ireland makes a human visit conceivable, especially before sea-level rise separated the island. Conceivable is not demonstrated. Older claims for Irish Palaeolithic occupation have repeatedly failed to produce secure associations between artefacts or cut marks and securely dated deposits. The earliest presently accepted direct evidence of human activity in Ireland is much later: cut marks on a brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to about 12,810–12,590 cal BP.

That long gap should discourage a familiar historical temptation: importing the social world of later hunter-gatherers into a period without people. There were no known camps, families, territories, leaders or ritual places here in 31,670 BCE. If people did make an unrecorded incursion, its scale, duration,

technology and outcome are unknown. Ice-sheet erosion, subsequent sediment movement and the limited survival of very old archaeological deposits may partly explain the silence, but explanation of the gap is not evidence that fills it.

A History Written Indirectly

The Ireland of this period is thus best understood as a changing ecological frontier, not as a society awaiting named history. Its “economy” was the transfer of energy through wetland plants, insects, herbivores and predators; its regional connections were movements of fauna across landscapes now altered or drowned; its decisive conflicts were climatic shifts, freezing, thawing, erosion and advancing ice. Cave bones and a buried Fermanagh freshwater bed are modest survivals, but they reveal a country repeatedly made habitable, difficult and uninhabitable again by Ice Age change.

Derryvree’s value lies precisely in its restraint. Beneath later glacial sediment, it preserves evidence that an open, cold wetland briefly existed between episodes of ice advance. Around the modern label 31,670 BCE, that is the clearest historically responsible picture: not kings or monuments, but silts, water, plants, insects, wandering mammals and an unstable climate on the verge of profound transformation.

Chapter 032 of 100

31669 BCE

Sedges Beneath Fermanagh ^[32]



“31,669 BCE” is a modern way of placing a point deep in the past, not a date that people in prehistoric Ireland could have recognised or recorded. No annual chronicle, settlement sequence or securely dated human event allows historians to describe this particular year. At this depth of time, even radiocarbon measurements produce broad calibrated ranges rather than calendar-year precision. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, within the Last Glacial Period: an unstable, cold age when the island’s landscapes, animal populations and ice cover were changing on scales of centuries and millennia.

The closest Irish environmental evidence is a freshwater deposit exposed at Derryvree, near Maguiresbridge in County Fermanagh. Organic silts and fine sands lay between two beds of glacial till within a drumlin. Their position is crucial: they preserve an interval in which water, plants and animals occupied the site after one phase of ice deposition and before a later advance buried the evidence. A radiocarbon determination from the deposit gave 30,500 radiocarbon years before present, with a large uncertainty. Published calibration places the material broadly around 36,900–31,700 calendar years before present, approximately 34,950–29,750 BCE. Thus 31,669 BCE falls within the far end of that wide range, but cannot be isolated within it.

A Cold-Stage Landscape

Derryvree is not a complete portrait of all Ireland. It is a small local archive, and its pollen was poorly preserved. Yet the combined plant, moss and insect evidence is unusually valuable because later glaciation removed or disturbed so much of the island’s earlier surface record. It indicates an open, treeless and wet landscape commonly described as tundra or muskeg: sedge-rich ground, mossy marsh, shallow freshwater and patches of exposed mineral soil, rather than an unbroken wilderness of ice or snow.

Grasses, sedges, herbs, juniper and cold-adapted mosses point to sparse but real vegetation. Some aquatic plant evidence indicates freshwater nearby. The word “tundra” should not conjure a single modern analogue. The Fermanagh lowlands may have contained pools and saturated hollows amid drier, wind-scoured ground; vegetation would have altered with drainage, snow cover, season and temperature. It was a hard environment, but not a lifeless one. The plants preserved at Derryvree were the base of a food web that could sustain insects, birds and grazing mammals.

The wider Irish evidence suggests a markedly seasonal climate. Permafrost or seasonally frozen soils, frost action and limited tree growth belong to this broad picture. Winters were severe; summers, though brief, could permit a flush of herbaceous growth. Interpretation must nevertheless remain cautious. A fossil plant assemblage cannot supply an exact temperature for a named year, and conditions in sheltered Fermanagh need not have matched exposed Atlantic coasts, mountains or the southern limestone country.

Animals Before the Ice Maximum

Castlepook Cave, near Doneraile in north Cork, provides the principal faunal archive relevant to this period. Excavations in the early twentieth century recovered more than 2,000 bones and teeth from a complex cave system whose galleries were given evocative names including Hyenahall and Elephant Hall. Modern re-dating has shown that surviving bones represent a long and complicated history, not one single occupation episode. Individual results span much of the middle and later Ice Age, and the cave deposits have also been affected by antiquarian excavation, mixing and later contamination.

Even so, the assemblage establishes that Ireland was visited by an impressive cold-stage fauna before the Last Glacial Maximum. It includes reindeer, mammoth, giant deer, wolf, fox, Arctic fox, brown bear, spotted hyaena, mountain hare and lemmings. Not every animal necessarily lived at Castlepook at the same moment, nor do their remains prove a single open plain extending over the island. But together they show that suitable habitats and routes existed for large herbivores and their predators during portions of Marine Isotope Stage 3.

For a date around 31,669 BCE, reindeer are especially evocative but should not be over-romanticised. Their presence supports the inference of open country with available forage; mammoth and giant deer likewise imply substantial grazing resources somewhere within the connected landscapes available to them. Hyaena bones and gnawing evidence remind us that caves could be carnivore dens, feeding places and bone traps rather than domestic shelters. A cave faunal collection is therefore evidence both of living animal communities and of the ways death, scavenging, water movement and excavation concentrated remains.

Ice, Water and Changing Connections

Ireland was not yet necessarily the fully ice-covered island of the Last Glacial Maximum. Research on the British–Irish Ice Sheet shows that its growth and peak were regionally asynchronous. The largest expansion followed later, with maximum ice volume around 23,000 years ago and extensive advance across Ireland and the surrounding continental shelf during the period broadly between 30,000 and 22,000 years ago. Evidence from Derryvree, Greenagho and other sites indicates that parts of Ireland had been ice-free or only locally glaciated during earlier phases of this long build-up.

That does not mean that a traveller in 31,669 BCE could simply have crossed a stable land bridge from Britain or continental Europe. Sea level was lower than today, exposing additional land on the continental shelf, but coastlines, ice margins, estuaries and channels were changing. Whether dry,

continuous walking routes existed at any particular time is a difficult palaeogeographical question, not a fact that can be assumed from lower sea level alone. Ireland's animal evidence proves repeated access at some stages; it does not map the route, season or duration of every arrival.

The approaching ice-sheet expansion is the central development behind the sparse evidence. Glaciers reshaped valleys, carried sediment, built and remodelled drumlins, and eventually erased many landscapes on which animals or people might once have left traces. Derryvree survived precisely because its freshwater sediments became sealed under later till. This uneven preservation helps explain why prehistoric Ireland before the final stages of the Ice Age appears so fragmentary: absence of excavated sites is not automatically proof that no activity ever occurred.

The Human Question

There is no securely identified camp, hearth, tool assemblage, burial or dwelling that can be assigned to Ireland in 31,669 BCE. Consequently there is no basis for describing an Irish population, language, kin group, political authority, diplomacy, warfare, ritual or trade network at this date. Terms such as Ireland, Fermanagh and Cork are used only as modern geographical conveniences. There were no states, counties or communities documented by written sources, and no evidence for farming, permanent villages, monuments, metalworking or exchange systems of the kinds known from much later Irish prehistory.

A reindeer femur from Castlepook has, however, made the question of human presence more urgent. A deep mark on the bone has been interpreted as a fresh-bone cut or chop made by a sharp stone implement during carcass processing, and the bone has been reported as about 33,000 years old. If both the dating and modification interpretation are sustained, the find could indicate a brief Upper Palaeolithic human incursion into Ireland during the broad era considered here.

That conclusion should remain provisional. A marked bone is not equivalent to an excavated settlement, and a single find cannot reveal the size, origins, duration or practices of any visiting party. The contextual history of Castlepook is difficult, while reassessment of Irish cave material has shown why old collections demand modern dating and taphonomic study. The better-established evidence for human activity in Ireland comes far later: a butchered brown-bear bone from Alice and Gwendoline Cave in County Clare dates to roughly 12,810–12,590 calibrated years before present. It demonstrates Upper Palaeolithic activity near the end of the Ice Age, but cannot be projected back twenty millennia.

Everyday Life Without a Community Record

If people did reach Ireland in the broader period around 31,669 BCE, comparative Upper Palaeolithic archaeology suggests that they would have depended on mobile hunting, gathering and careful use of animal materials. Such a statement is an inference from neighbouring European evidence, not a description of a known Irish camp. Reindeer and other large animals could have provided meat, fat, hides, sinew and bone; caves could have offered temporary shelter but were also dangerous places contested by carnivores. Movement, weather and access to fuel would have governed survival.

There is no direct Irish evidence from this horizon for ceremonial life, images, musical instruments, formal exchange or teaching traditions. Nor is silence proof that people lacked them: it reflects the extreme limits of the archaeological record. What can be said is that knowledge of seasonal animals, wet ground, safe water and changing ice would have been essential to any human visitor. For the animals actually attested, those same environmental constraints structured migration, predation and reproduction.

A Record of Possibility

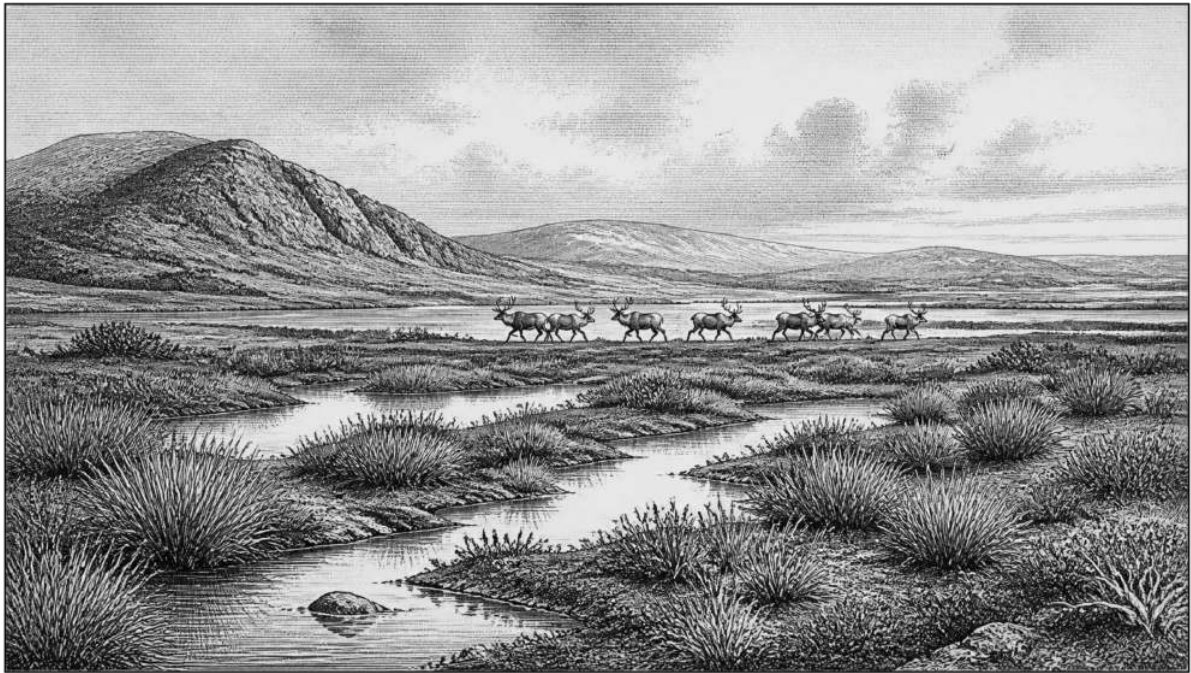
The historical importance of this date lies less in an event than in a threshold. The Derryvree sediments show that a biologically active, treeless freshwater landscape existed in Fermanagh within a wide calibrated period encompassing 31,669 BCE. Castlepook records a rich Ice-Age fauna in Cork and preserves a debated clue to very early human contact. Together they replace the older image of a uniformly blank, permanently ice-bound Ireland with a more careful one: regional habitats opened and closed, animals entered and disappeared, and the expanding ice sheet increasingly transformed the island.

This was not yet a society from which political history can be written. It was a changing Pleistocene environment whose surviving silts, mosses, bones and cave sediments set strict limits on storytelling. The evidence supports open cold-country wetlands, large mammals and an approaching phase of major glaciation. It supports only the possibility—not a securely documented fact—of human visitors. That distinction is the most important lesson of Ireland around 31,669 BCE.

Chapter 033 of 100

31668 BCE

A Reindeer Femur at Castlepook^[33]



31,668 BCE is a modern chronological label, not a year that anybody in prehistoric Ireland could have named, recorded or remembered. Calendar-year precision is impossible at this distance. In scientific terms, the date falls roughly 33,600 calendar years before 1950, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the Late Pleistocene. Ireland offers no settlement, grave, hearth or written testimony that can be assigned to this individual year. What can responsibly be described is a changing Ice Age landscape, reconstructed from cave bones, buried freshwater deposits, pollen, plant remains, insects, glacial sediments and radiocarbon measurements with broad statistical ranges.

A Cold, Changing Island

This was long before the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest later extent, broadly around 27,000–23,000 calibrated years before present. Around the notional date in question, however, Ireland was not simply a featureless sheet of ice. The evidence indicates that conditions varied sharply through MIS 3. Periods of ice expansion alternated with intervals in which parts of the land supported open vegetation, freshwater pools and large mammals. The scale, timing and regional extent of ice remained uneven and are still debated by glacial geologists; a description that fits County Fermanagh need not fit north Cork at exactly the same moment.

The familiar green, wooded Ireland of recent millennia did not exist. In places capable of supporting life, the prevailing scene was likely an open, cold and windy one: grassland, herb-rich tundra, sedge-dominated wet ground, dwarf shrubs and patches of sparse scrub rather than closed forest. Winters may have been severe and summers short. Such terrain could sustain grazing animals and their predators, but it

was vulnerable to abrupt climatic reversals. The plants and animals recorded in Irish deposits are therefore evidence for habitats across broad intervals, not a guarantee that every species shared one valley or one season.

The Derryvree Window

One of the most valuable Irish records for this general world comes from Derryvree near Maguiresbridge, County Fermanagh. There, roadworks exposed freshwater silts, sands and organic sediments trapped between two deposits of glacial till beneath a drumlin. The sequence matters more than any single find. Lower till shows that ice had previously crossed the ground; freshwater sediment then accumulated during an ice-free interval; upper till shows that renewed glaciation later buried and protected the deposit. It is a geological archive of major environmental change, not a human habitation site.

A radiocarbon determination from Derryvree of about 30,500 radiocarbon years before present has a substantial uncertainty. Calibration places the relevant episode broadly within c. 36,900–31,700 calibrated years before present. That range overlaps the broad chronological neighbourhood of 31,668 BCE, but cannot pinpoint it. Mosses, sedges, bogbean, mountain avens and other plant remains, together with insect evidence, point towards a cold, open and wet landscape. Freshwater hollows and seasonally saturated ground existed amid treeless terrain. Scattered tree pollen is not enough to demonstrate nearby woodland: pollen can travel long distances or be redeposited.

Derryvree is particularly important because later ice did not erase everything. Much Irish evidence from this age was destroyed, disturbed or hidden by successive glaciations, rising seas and later sediment. The survival of an inter-till wetland gives historians and scientists a rare glimpse of ecological possibility in northern Ireland. It does not reveal settlements, languages, kin groups or beliefs. Its value lies in establishing that, during part of this broad interval, a periglacial environment existed in which animal movement and perhaps short human incursions were physically possible.

Castlepook's Animal World

In north County Cork, Castlepook Cave, also known as Mammoth Cave near Doneraile, has produced Ireland's most celebrated assemblage of older Late Pleistocene animal remains. Excavations conducted mainly in the late nineteenth and early twentieth centuries recovered bones attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, red fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. A radiocarbon age of $33,400 \pm 1,200$ radiocarbon years before present on mammoth collagen has long been used to place part of the assemblage in the Middle Devensian, the British and Irish term for this phase of the last glacial cycle.

That impressive list must nevertheless be handled with care. Castle deposits accumulated through natural deaths, carnivore activity, water movement and changing cave conditions. Antiquarian excavation also disturbed the deposits before modern recording standards existed. Some bones may belong to different episodes rather than a single contemporaneous community. The cave was not necessarily a mammoth-hunters' camp; its fauna includes powerful carnivores, and hyaena remains and damage on bone show that predators used the area. Castlepook documents an Ice Age faunal landscape in southern Ireland, but it cannot by itself provide a neatly dated snapshot of one year.

The animals suggest an ecosystem unlike modern Ireland. Reindeer and lemmings are consistent with cold, open country; mammoth and giant deer indicate substantial grazing resources; wolves and hyaenas point to a food web in which carcasses were contested and rapidly consumed. Caves could offer shelter to animals and preserve bones, but they were not automatically desirable or safe places for people. An animal bone in a cave is evidence of the animal, not automatically of human hunting, food storage or residence.

The Mark on the Reindeer Bone

Human history enters the picture through one exceptionally small and contested-looking trace: a reindeer femur from the Castlepook collection. Zooarchaeologist Ruth Carden identified a deep linear mark on the bone as consistent with modification by a sharp stone implement while the bone was fresh, and County Cork heritage publications have presented it as evidence that Stone Age hunters processed reindeer around 33,000 years ago. If that interpretation is sustained by further study, it would be the earliest currently proposed evidence for human activity in Ireland by a very large margin.

Yet the conclusion must remain deliberately limited. A radiocarbon result dates the animal material sampled, within a probability range; it does not date every bone from a disturbed cave deposit or prove when a mark was made. Nor has Castlepook yielded a securely associated stone-tool assemblage, hearth, dwelling floor, human skeleton, ornament, burial or repeated domestic refuse of this age. Natural breakage, carnivore action and excavation damage can complicate the reading of bone surfaces. New investigations in the cave have identified surviving Pleistocene deposits, offering the prospect of better stratified evidence, but the case for people at Castlepook remains a promising inference rather than a fully documented settlement.

People Without a Political History

There is no responsible political narrative for Ireland in 31,668 BCE. No evidence identifies a chiefdom, territory, alliance, war, diplomatic meeting or named community. There is equally no basis for attaching later Irish identities, languages, religions or ancestry to any possible visitors. If people did reach southern Ireland, they were almost certainly mobile Upper Palaeolithic hunter-gatherers, probably *Homo sapiens*, operating within wider north-west European social networks. That is a comparative interpretation drawn from contemporaneous societies elsewhere, not a fact established by an Irish settlement.

Likewise, no Irish evidence of this age permits confident statements about households, gender roles, ritual, art, teaching or exchange. Elsewhere in Upper Palaeolithic Europe, people made sophisticated stone and organic tools, tailored clothing, ornaments and images, and maintained social links across considerable distances. None of these practices can simply be imported into Ireland without material proof. The most that the reindeer femur could indicate is a practical action: perhaps the cutting, jointing or removal of meat from a carcass by one or more people equipped with a sharp lithic edge.

Movement, Resources and Limits

If visitors were present, reindeer would have offered meat, fat, hide, sinew and bone; a single carcass could have been valuable in a resource-poor cold landscape. But the evidence cannot tell whether people killed the animal, encountered it already dead, followed a seasonal herd, or made only a short stop. Nor can it settle how they arrived. Lower sea levels changed the outlines of the Irish and Celtic seas, while ice

and water created a complex, shifting geography. Geological work does not support a simple, durable walkable land bridge across the Irish Sea. Any journey from Britain or the European mainland may have involved difficult coastal, ice-margin or water crossings.

Permanent occupation is especially unlikely to be demonstrated from a lone modified bone. The later advance of the Irish Ice Sheet would have transformed or obliterated many landscapes and, if people had visited, probably ended any local occupation. There is no evidence of continuity between this tentative episode and the much later, better-attested settlement of post-glacial Ireland. The history here is not one of an established Ice Age population waiting to become later Ireland, but of a land repeatedly made hospitable and inhospitable by climate.

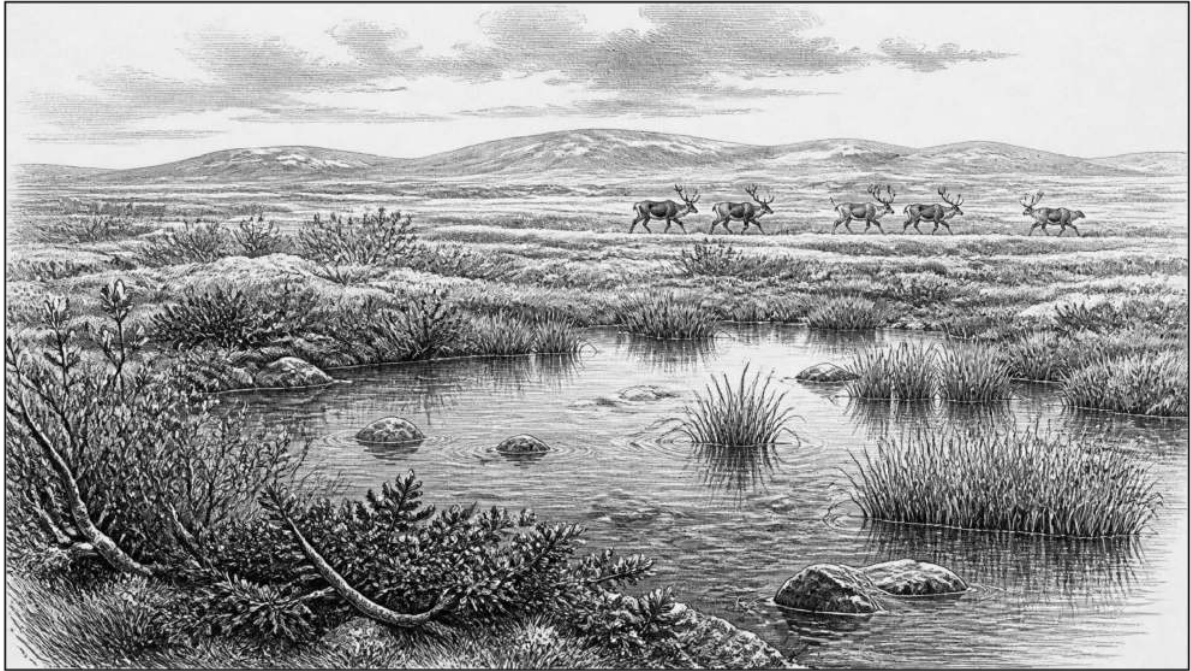
An Evidence-Rich Silence

The significance of 31,668 BCE lies in that tension. Ireland was not outside the Ice Age world: wet tundra basins survived in Fermanagh, large mammals ranged through parts of the island, and Castlepook preserves an extraordinary record of their presence in Cork. A marked reindeer bone raises the serious possibility that people briefly entered that world and processed an animal there. But the archaeological record does not yet allow a story of a camp, a family or a hunting expedition. For this remote date, intellectual honesty is not a lack of imagination. It is the recognition that bones, silts and pollen can illuminate an ancient landscape more securely than they can name those who may have crossed it.

Chapter 034 of 100

31667 BCE

The Maguiresbridge Interstadial^[34]



Modern calendar-year precision is not available for Ireland in 31,667 BCE. This label is a retrospective convenience, applied tens of millennia before calendars, writing, named communities or political institutions existed on the island. In archaeological terms it lies approximately 33,600 calendar years before 1950, within the Late Pleistocene and broadly within Marine Isotope Stage 3, an exceptionally changeable portion of the last Ice Age. The responsible historical frame is therefore not a supposed event in one year, but a calibrated span of centuries and millennia around it.

For this point in time, the best Irish evidence comes not from settlements or artefacts left in the open, but from deposits protected beneath later glacial sediments and from animal bones in limestone caves. They show that parts of Ireland could support cold-adapted plants and mammals before the island was overwhelmed by the last great expansion of the British–Irish Ice Sheet. They do not provide a continuous narrative, nor do they prove that people lived permanently in Ireland. Their importance lies precisely in the fragments: silts, pollen, seeds, mosses, bones, cave passages and a debated mark on a reindeer femur.

A Date Range Rather Than a Year

The closest securely dated environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands trapped between two tills within a drumlin. The organic deposit produced a conventional radiocarbon age of about 30,500 years BP. Calibration has placed it broadly between about 36,900 and 31,700 calibrated years BP. Thus 31,667 BCE falls near the younger end of a wide range relevant to this buried landscape, not at a pinpoint that can be matched to a season, a generation or an individual occurrence.

Another Fermanagh deposit, at Greenagho near Belcoo, has produced organic material dated broadly to about 37,200–35,700 calibrated years BP. Together, the sites demonstrate that north-central Ireland was not continuously entombed beneath ice during this earlier phase of the last glaciation. Yet neither is a complete national climate record. Derryvree and Greenagho preserve local conditions in particular basins; Ireland's coasts, uplands and western districts could have experienced rather different conditions. Their chronology also carries the uncertainties normal for radiocarbon ages approaching its practical limits.

Fresh Water Under Future Ice

Derryvree is striking because the freshwater sediments were later overridden and buried by ice-derived material. At the time represented by the silts, however, there was standing or slow-moving fresh water in a lowland hollow, with sediment accumulating amid a cold, open landscape. Fossil plant remains and pollen indicate tundra or tundra-steppe conditions rather than forest. Sedges, grasses and herbs were important. Mosses, including cold-tolerant species, help to describe wet ground around pools and marshes. Bogbean and water-milfoil attest freshwater habitats, while dwarf willow and scattered juniper point to low woody vegetation in sheltered places.

This was not a familiar modern Irish countryside transported into the Ice Age. Trees were absent or extremely sparse, and exposed ground would have been shaped by frost, wind and seasonal thaw. Permafrost or strongly periglacial conditions are consistent with the wider evidence, although their local intensity cannot be reconstructed day by day. In summer, shallow water, wet sedge margins and flowering herbs could have made selected hollows comparatively productive. In winter, the same country was a far more severe place: open, treeless and vulnerable to bitter winds.

Animals on an Open Plain

The cave record of southern Ireland supplies the animal dimension. Castlepook Cave near Doneraile, County Cork, has yielded remains attributed to a varied Late Pleistocene fauna: reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, spotted hyaena and lemmings. Not all the bones belong to one moment. Cave sediments were disturbed in antiquarian excavations, material was deposited over long intervals, and carnivores could carry carcass parts into dens. The collection therefore cannot be treated as a census of animals seen together in 31,667 BCE.

Nevertheless, improved radiocarbon dating has reinforced the broad conclusion that several large mammals reached or survived in southern Ireland during Marine Isotope Stage 3, before the Last Glacial Maximum. Reindeer especially fit the open, cold vegetation suggested in Fermanagh. Mammoths and giant deer indicate that, at least intermittently, the island formed part of a wider north-west European ecological zone capable of sustaining very large grazers and browsers. Predators such as wolf and hyaena remind us that carcasses, rather than human hunters, may account for much of what entered cave chambers.

The landscape was changing rapidly on geological timescales. Research on the last British–Irish Ice Sheet indicates that its growth and maximum were asynchronous across Britain and Ireland. Some Irish areas remained ice-free until around 34,000 years ago, while ice expanded elsewhere or later. By the global Last Glacial Maximum, conventionally placed around 26,000–20,000 calibrated years BP, much or all of Ireland was subject to extensive ice cover. The Derryvree freshwater world belonged to the unstable lead-up to that transformation, when habitable ground still existed but its long-term security was diminishing.

The Castlepook Human Question

The most provocative evidence relevant to this era is a reindeer femur from Castlepook. It has been presented by zooarchaeologist Ruth Carden as bearing a deep incision made with a sharp stone edge while the bone was fresh, and it has been publicly dated to about 31,000 BC. If that interpretation is confirmed, it would represent evidence that Upper Palaeolithic people butchered a reindeer in Ireland far earlier than the island's formerly accepted record of human activity.

That conclusion needs careful wording. The bone is evidence for an animal of great age; the identification of the incision as a human tool mark is a separate taphonomic interpretation. No associated stone toolkit, hearth, dwelling floor, human skeleton or securely excavated butchery site has yet established a permanent human population at Castlepook. Nor can the cave prove that the animal was killed there. A plausible reconstruction is that hunters processed a carcass somewhere in the surrounding landscape and that scavengers later transported discarded remains into the cave. But this remains a hypothesis, not a recovered scene.

The wider European setting makes a short-lived visit conceivable. Upper Palaeolithic hunter-gatherers were living in parts of Britain and continental Europe, using stone tools and pursuing large game. Lower sea levels reshaped the seas around north-west Europe, but the exact nature, timing and usefulness of routes between Ireland, Britain and the continent remain contested. One should not imagine a simple permanent land bridge or a straightforward migration corridor. A human presence in Ireland at this date, if the Castlepook mark proves anthropogenic, may have been brief, mobile and archaeologically almost invisible.

No States, No Diplomacy

There is no evidence for political affairs in the later historical sense: no chiefs known by name, territories, law, diplomacy, tribute, warfare, monuments or collective institutions can be assigned to Ireland at this time. Even the existence of a resident human group is unproven. It would be misleading to invent clans, rituals or rival hunting territories from a single marked bone and a scattered faunal collection. Conflict can be discussed only at the ecological scale: animals competed for food and shelter, predators hunted prey, and any people who entered this landscape faced serious risks from weather, isolation and carnivores.

Similarly, nothing direct can be said about religion, language, stories, music, art or formal learning in Ireland around this date. Upper Palaeolithic communities elsewhere in Europe possessed rich social and symbolic practices, but that continental evidence cannot simply be projected across the Irish Sea. If people did reach Ireland, they surely brought knowledge: routes, seasonal animal behaviour, stone-working skills, fire-making and the practical co-operation required for hunting and survival. Such knowledge is an inference from human lifeways elsewhere, not an Irish archaeological fact.

Economy Without Markets

There was no economy of farms, coinage, towns or long-distance trade documented in Ireland. The only economically relevant possibility is mobile hunting and scavenging. Reindeer would have supplied meat, fat, hide, sinew, antler and bone; large mammals could yield substantial returns but also required

planning, tools and social co-operation to exploit safely. Yet no Irish stone tools of this age have been recovered to demonstrate that such work occurred on a regular basis. The Castlepook femur can at most suggest one episode of carcass processing.

The strongest story for 31,667 BCE is consequently environmental. Ireland was not yet the green, wooded island familiar from later prehistory. In and around Fermanagh, freshwater basins lay amid open tundra vegetation; in southern limestone country, caves accumulated traces of cold-climate animals and carnivores. Ice was a growing presence in the wider region, although its timing and extent varied. This was a landscape capable of supporting life, perhaps occasionally including visiting humans, but one about to be profoundly altered by advancing ice.

What the Evidence Can Bear

For Ireland around 31,667 BCE, evidence and interpretation must remain distinct. The evidence includes freshwater sediments beneath till at Derryvree, dated organic deposits at Fermanagh sites, cold-climate plant fossils, and Pleistocene animal remains from caves including Castlepook. Interpretation connects them into a picture of open, periglacial habitats and a shifting pre-maximum glacial landscape. The possibility of human butchery at Castlepook is important, but remains more fragile than the environmental record.

That restraint does not make the period empty. It reveals an Ireland whose history was written in ecological opportunity and climatic instability: sedges growing at a pool edge, reindeer moving across exposed country, carnivores using caves, and glaciers preparing to erase or bury much of the surface record. The Maguiresbridge deposits preserve an unusually vivid window onto that lost world. They also explain why certainty is scarce. The later ice sheet did not merely reshape the island; it removed, mixed and sealed much of the evidence by which its earliest possible inhabitants might otherwise be known.

Chapter 035 of 100

31666 BCE

Greenagho's Buried Lake^[35]



“31,666 BCE” is a useful modern label, not a date that can be matched to a recorded Irish event. No written calendar, named community, ruler or securely dated human settlement allows history to be told year by year at this depth of time. The responsible approach is to place the notional year within the later part of Marine Isotope Stage 3, an unstable phase of the last Ice Age. Radiocarbon results must be calibrated, and their ranges are often measured in centuries or millennia rather than single years. On that basis, this date falls within a period when parts of Ireland were probably still open to plants and animals, even as major expansion of the British–Irish Ice Sheet was approaching.

A Landscape Before the Maximum Ice

The crucial evidence comes not from a settlement but from sediment buried beneath later glacial deposits. At Derryvree, near Maguiresbridge in County Fermanagh, road works exposed freshwater silts and fine sands trapped between two layers of till. The organic material within them produced a radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP. Calibrated estimates cited in later glacial reconstructions place the deposit broadly between about 36,900 and 31,700 calendar years BP. That wide range embraces a notional date of 31,666 BCE, but it does not identify a particular season, year or even human generation.

The Derryvree deposits demonstrate something important: north-central Ireland had not yet been continuously overwhelmed by the later ice sheet. Freshwater sediments, plant remains and small animal evidence accumulated in a local wetland or shallow-water setting before advancing ice covered and preserved them. The very survival of this archive is exceptional. Subsequent glaciers scoured much of Ireland's older surface record away, while caves, sheltered hollows and sediments sealed beneath till retained rare fragments of the earlier world.

Greenagho, also in County Fermanagh, supplies a related clue. Organic lake deposits beneath till there have yielded an age of $32,500 \pm 300$ radiocarbon years BP, calibrated broadly to around 37,200–35,700 calendar years BP. The precise relationship between these sites, climatic phases and ice advances remains debated, but together they show that inland water, vegetation and ice-free ground existed in this part of Ireland during the middle to later last glacial cycle. They do not show that the whole island was hospitable at once. Conditions varied sharply by region, altitude, season and proximity to ice.

Cold Wetlands and Open Ground

The flora recorded at Derryvree is the basis for a cautious reconstruction of its environment. Fossil remains include plants associated with cold, open and wet ground: sedges, mosses, dwarf willow, mountain avens and bogbean. These species do not recreate a single uniform scene. Rather, they indicate a mosaic of damp hollows, shallow pools, mineral-rich marshes and exposed ground under a cold climate. Trees were absent or extremely scarce locally. This was not the later, familiar Ireland of oak woodland, blanket bog and enclosed fields, but a treeless periglacial landscape shaped by frost, wind, seasonal thaw and changing water levels.

Such ground could nevertheless be productive. Short growing seasons can sustain sedges, herbs and low shrubs; watercourses and wetlands create distinct ecological niches; and sheltered limestone districts may have offered cover unavailable on exposed uplands. The words “tundra” and “mammoth steppe” are useful broad comparisons, but neither should be treated as a complete map of Ireland in this period. The evidence is site-specific, and climate shifted repeatedly across the North Atlantic world. An interval favourable to plants and grazing animals could be followed, in geological terms rapidly, by renewed cold and encroaching ice.

At the scale of the island, the approaching transformation mattered more than any local continuity. New reconstructions of the British–Irish Ice Sheet suggest major growth in its northern sectors around 32,000–31,000 years ago. The ultimate maximum came later, around 27,000 years ago, but its build-up was already remaking routes, drainage systems and habitats. Around the notional year considered here, Ireland was therefore not simply “before the Ice Age”: it was already deep within an Ice Age, in a landscape where ice margins and ice-free refuges could alter dramatically.

Castlepook’s Animal World

County Cork provides the richest, though complicated, glimpse of larger animals in Ireland during this broad period. Castlepook Cave near Doneraile, long known as Mammoth Cave, was excavated in the early twentieth century by Richard Ussher and colleagues. Its collections include remains attributed to woolly mammoth, reindeer, giant deer, spotted hyaena, brown bear, wolf, fox, Arctic fox, mountain hare and lemmings. A mammoth bone formerly dated to about 33,500 radiocarbon years BP and later reassessment of faunal dates place significant elements of the cave record in Marine Isotope Stage 3, before the Last Glacial Maximum.

This assemblage is evidence that an Ice Age fauna reached or lived in southern Ireland at various times. It does not prove that every listed animal shared the same valley in the same century. Castle deposits accumulated through natural processes: animals died or were dragged in, carnivores used chambers, water moved sediment, and excavators working more than a century ago could not recover modern standards of stratigraphic information. Individual fossils have also been re-dated as laboratory methods improved. The cave is best understood as a long, disturbed archive rather than a snapshot.

Even so, the animal record suggests food webs more varied than Ireland's modern terrestrial fauna. Reindeer could have exploited open grazing, while giant deer browsed or grazed where vegetation permitted. Hyenas and wolves were predators and scavengers; bears may have used caves as dens or winter refuges. Mammoths imply access, at least intermittently, to extensive open habitats with enough forage for very large herbivores. The missing evidence matters too: not every mainland European Ice Age species is securely known from Ireland. Faunal movement depended on changing sea levels, ice barriers, coastal plains and passages through Britain, not on a permanently available land bridge.

The Human Question

The most arresting possible human evidence is also the most limited. A reindeer femur from Castlepook, recovered from old collections, has been reported as roughly 33,000 years old and bears a deep mark interpreted by zoologist Ruth Carden as the product of a sharp stone tool used in carcass processing. If that diagnosis and association are sustained, it would indicate that Upper Palaeolithic people reached Ireland during this general phase of the last glacial cycle and handled a reindeer here.

That is not the same as evidence for an Irish population. No securely associated hearth, stone-tool assemblage, shelter floor, burial, repeated camp or settlement of comparable age has been excavated at Castlepook. The date obtained from bone measures the animal's death, not automatically the moment of cutting; the bone's recovery from a historically excavated cave makes its original context especially difficult to reconstruct. Nor can one mark establish whether people stayed for hours, days or seasons. The interpretation is important precisely because it is testable: new excavation, microscopic study of surface modification, direct dating and securely stratified finds may clarify it.

It is reasonable to say that small, mobile hunter-gatherer groups were present elsewhere in north-west Europe at this time, equipped with stone technologies and capable of exploiting large animals. It is not reasonable to project their particular languages, identities, ritual practices, art or social organisation into Ireland without Irish evidence. The Castlepook femur permits a narrow economic inference only: if its incision is genuinely anthropogenic, someone understood the practical value of a reindeer carcass—meat, hide, sinew, marrow or bone. It cannot yet support claims of trade, regular diplomacy, territorial polities or a continuous colonisation.

No Kingdoms, No Monuments

Political affairs, warfare and diplomacy leave no identifiable Irish record for 31,666 BCE. There were no states, kingdoms, towns, farms, churches, monuments or writing systems from which to reconstruct institutions. Nor is there evidence for long-distance exchange involving Ireland at this point. The distant Atlantic façade was instead a shifting ecological frontier, its routes altered by low sea levels, cold seas and advancing ice. Any human visitors, if present, would have moved through landscapes and connections very unlike the later island world.

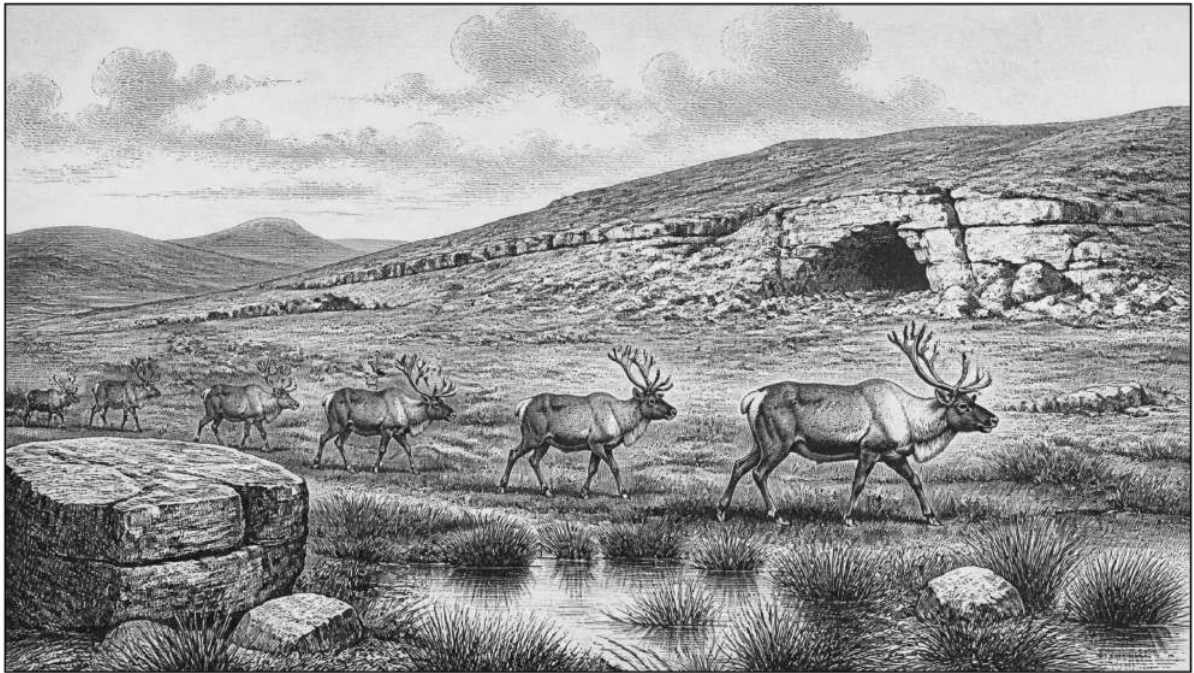
Religion, culture and learning are equally beyond recovery in specifically Irish terms. Upper Palaeolithic communities in continental Europe made art, ornaments and sophisticated tools, but no comparably dated Irish artefact permits us to claim equivalent practices here. Silence is not proof of absence; it is a reminder that survival and discovery are uneven. Caves preserve bones better than camps, and glaciers remove evidence more efficiently than they preserve it.

The enduring importance of this notional year lies in that distinction between evidence and interpretation. Derryvree and Greenagho show that cold freshwater environments persisted in parts of Ireland before later ice advance. Castlepook confirms an unexpectedly rich Ice Age fauna in the south and raises the serious possibility of very early human activity. Together, these traces replace an older picture of an empty, uniformly frozen Ireland with a more dynamic one: an exposed, treeless and seasonally harsh land, intermittently capable of supporting wetlands, herds, predators and perhaps brief human incursions, before the expanding ice sheet erased much of what came before.

Chapter 036 of 100

31665 BCE

Castlepook's Reindeer Mark^[36]



The date 31,665 BCE is a modern calendar label, not a year that can be observed in Ireland's prehistoric record. No written chronology, named event or securely dated human occupation allows historians to describe a particular season, generation or political occurrence. In conventional archaeological terms it falls roughly 33,614 years before AD 1950, the reference point used for "before present" dating. That places it broadly within Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. Radiocarbon and luminescence methods can date selected bones or sediments to ranges, often with substantial uncertainty; they do not provide an Irish diary entry for this numbered year.

The closest evidence of special importance is from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Its animal remains illuminate a broad pre-Last Glacial Maximum world, while one reindeer femur has been publicly presented as dating to about 31,000 BCE and bearing a deep mark interpreted as the work of a sharp stone tool. That is an intriguing clue, not a licence to invent a settled Ice-Age community. The distinction between what is physically present in the archive and what archaeologists infer from it is especially important here.

A Time Before the Maximum Ice

Ireland around this broad point was cold, but it should not simply be pictured as an island wholly buried beneath the maximum ice sheet. The fullest extent of the last British–Irish Ice Sheet came later. Recent reconstructions generally place its maximum expansion around 27,000–23,000 calibrated years before present, although the timing and thickness of ice varied markedly between regions. Research on

southern Irish deposits likewise indicates that major tills there formed after about 24,000 calibrated years before present. Thus 31,665 BCE belongs to an earlier, changing phase of the last glacial cycle rather than to one uniform, island-wide scene.

This does not mean that conditions were mild or stable. Ice masses, sea level, frozen ground, rivers and exposed shelf landscapes all changed over long spans. The geography familiar on a modern map cannot be projected backwards without alteration: lower global sea levels exposed areas now under the Irish and Celtic Seas, while ice and local sea-level effects complicated access around the coasts. At this chronological resolution, scholarship cannot responsibly specify whether a particular valley was open, glaciated or traversable in the exact year named. It can say that Ireland formed part of a wider north-west European environmental zone in which routes for animals could open and close as climate and ice margins shifted.

Open Country, Not Green Ireland

The temperate, wooded island of later prehistory did not yet exist. Irish environmental sequences from cold-stage deposits, notably beneath drumlins in County Fermanagh, preserve pollen, seeds, mosses and insects that point to open, treeless or sparsely vegetated landscapes under periglacial conditions. Their precise ages do not convert neatly into the modern BCE year used here, and they must not be treated as a weather report for north Cork on one day. Yet they provide a responsible guide to the kind of terrain that could recur in Ireland during cold MIS 3 episodes: sedge-rich wet ground, dwarf shrubs, herbaceous vegetation, patches of bare or disturbed soil, shallow water and seasonal frost.

Such country was neither empty nor unproductive. It could support grazing and browsing animals, especially where rivers, springs, limestone shelter and varied ground created local habitats. The term “mammoth steppe” is useful only with care. It describes a broad Eurasian ecological comparison, not proof that every part of Ireland was a continuous dry grassland. Irish evidence instead suggests a mosaic of open habitats, wetlands and sheltered places. Wind, freezing and thawing, erosion and meltwater were formative everyday forces in the landscape, though no human observer from Ireland has left a record of them.

The Castlepook Animal Archive

Castlepook is the strongest direct window onto this earlier Ice-Age fauna. Antiquarian excavators, led in the early twentieth century by the naturalist Richard J. Ussher, recovered a very large collection from its limestone passages and chambers. Subsequent study and improved radiocarbon pretreatment have shown that some older Irish cave dates needed revision: samples from Castlepook proved thousands of radiocarbon years older than earlier results suggested. The cave is consequently central to understanding the presence in Ireland of animals during MIS 3, well before the Last Glacial Maximum.

The assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings, among other remains. This list should not be read as a single herd, pack or momentary ecological census. Cave deposits accumulated through different episodes, and old excavations did not record every layer to modern standards. Some bones may have been moved by scavengers, predators, water, digging or later disturbance. Nevertheless, the combined evidence establishes a richer Late Pleistocene mammal community than later Ireland possessed. Reindeer and lemmings indicate cold-adapted components; mammoth, giant deer and hyaena underline both the variety of large animals and Ireland’s ecological links with Britain and continental Europe.

Hyaenas matter particularly because caves can be their archives rather than human homes. A carnivore may drag limbs or carcass fragments underground, chew them, scatter them and leave deposits that later excavators encounter as a mixture. Castlepook's bones therefore document animal movement through the Awbeg valley landscape, but they do not automatically document hunting, cooking or habitation by people. The cave's importance lies partly in this very complexity: it preserves evidence of a food web and of the processes that shaped it, rather than a neatly sealed archaeological floor.

The Mark on a Reindeer Femur

The reindeer femur is the one object that raises the possibility of a much earlier human presence. County Cork heritage material identifies it as a Palaeolithic artefact from Castlepook, dates it approximately to 31,000 BCE, and describes a deep incision interpreted by the palaeozoologist Ruth Carden as having been made by a stone tool during carcass processing. If that interpretation is sustained, it would show that a person used a sharp lithic edge on fresh reindeer bone in Ireland during the Upper Palaeolithic. It could represent cutting meat, hide, sinew or access to marrow; the exact action cannot be recovered from the mark alone.

Its limits are as consequential as its promise. A radiocarbon result dates the death of the animal, not the identity of the person who may have marked it, the location at which the animal was killed, or the duration of any human visit. The femur derives from an old collection rather than a newly excavated, securely stratified occupation surface. No associated stone-tool assemblage, hearth, built shelter, human burial, artwork or repeated domestic debris of comparable age has yet been published from Castlepook. Renewed investigation of the cave has aimed to locate surviving deposits and test the archive with modern methods, but research questions are not results.

Accordingly, the femur cannot establish a permanent population, much less a named "first Irish" people. It provides a hypothesis of brief human activity at the north-western edge of Upper Palaeolithic Europe. The National Museum of Ireland's cautious position remains significant: clear Palaeolithic occupation has not yet been demonstrated by the conventional combination of securely excavated artefacts and context. The well-known flint flake from Mell, County Louth, is no solution to the problem; it was fashioned elsewhere and later carried into Irish deposits by ice.

People, Society and Silence

If people did reach Ireland around this broad period, they were almost certainly highly mobile hunter-gatherers rather than farmers or village-dwellers. Comparative Upper Palaeolithic evidence elsewhere in Europe makes temporary camps, close knowledge of animal behaviour, stone-working skill, warm clothing and seasonal movement plausible possibilities. But these are comparisons, not facts recovered from an Irish campsite. There is no evidential basis for estimating numbers, families, language, kinship, gender roles or the length of a visit. Nor can scholars attach the visitors to a named archaeological culture merely because the date overlaps with cultural traditions known elsewhere.

For the same reason, political affairs, diplomacy and warfare are unknowable rather than absent in some demonstrable constitutional sense. There were no states, borders, chiefs or treaties visible in the evidence. No trade network can be identified, although movement of people and animals through the wider region is environmentally credible. There is no evidence in Ireland at this date for farming, herding, fields, pottery, metalworking, monuments, formal burial practice, religious buildings, writing or institutional learning. A reindeer bone cannot bear the weight of such claims.

Religion and culture must likewise remain beyond recovery. A person who processed an animal may have had beliefs, stories, social obligations and technical learning, but none is recorded in the Castlepook evidence. The sharp edge inferred from the femur, if the interpretation is correct, would demonstrate practical knowledge transmitted between people. It would not reveal language, ritual, art or ethnic identity. The responsible history of this date is therefore one of carefully bounded possibility rather than romantic certainty.

An Island at Europe's Edge

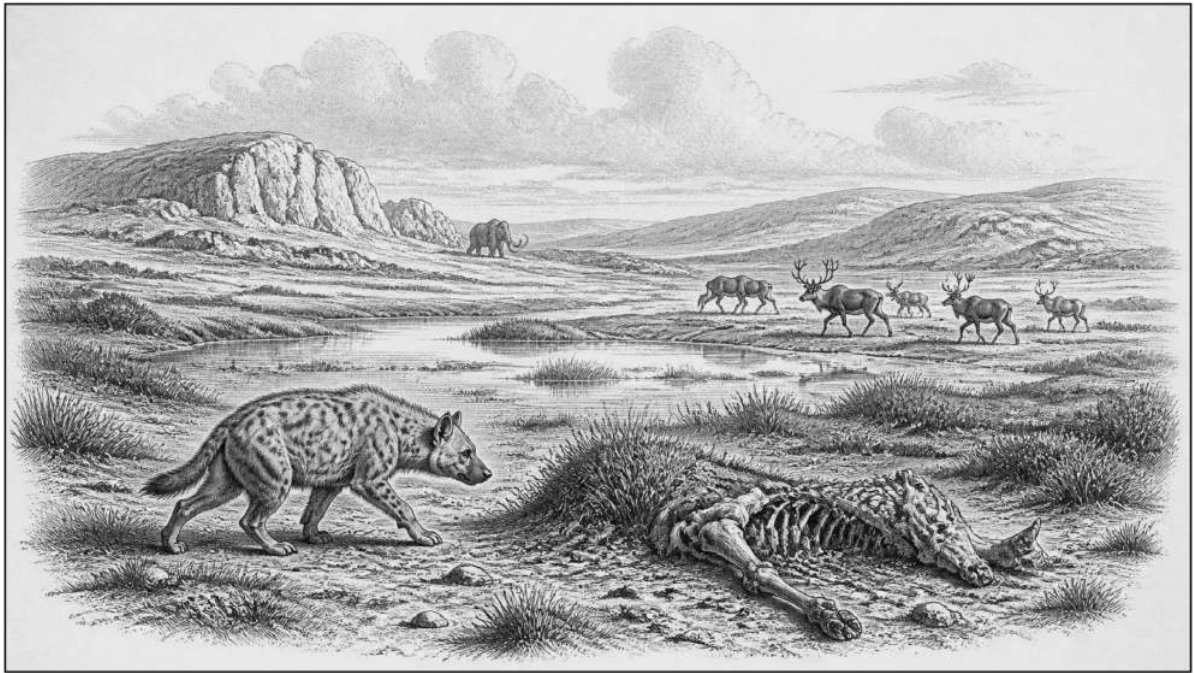
The larger significance of 31,665 BCE is environmental and methodological. Ireland was not outside Ice-Age Europe: Castlepook's fauna, and emerging genetic work on cave sediments, indicate connections with wider Eurasian animal populations before the glacial maximum. Yet Ireland's surviving human record remains exceptionally thin, repeatedly disrupted by ice advance, erosion, rising seas and the imperfect survival of caves and open-air sites. Absence of evidence is not proof that nobody ever arrived; neither is one marked bone proof of settled occupation.

At this remote date, Ireland's story is best told through that balance. The supported picture is of a severe but varied cold-stage landscape in which reindeer, mammoth, hyaena and other animals moved through open country and limestone caves accumulated their remains. The most exciting human clue is a single marked reindeer femur from Castlepook. It may eventually alter the history of the island's first visitors. For now, it asks a disciplined question rather than supplying a final answer.

Chapter 037 of 100

31664 BCE

Hyaena Land's Faunal Network^[37]



The label 31,664 BCE is a modern calendrical convenience, not a date that can be matched to a recorded Irish event, season or generation. No written calendar existed, and the surviving evidence cannot be resolved to a single year. In conventional radiocarbon terms it falls roughly 33,600 years before 1950; the responsible chronological setting is the later part of the Last Glacial period, within Marine Isotope Stage 3 (MIS 3), rather than a precise historical year. For Ireland, this is an archaeological and environmental horizon known through cave bones, buried sediments, pollen, insects, cave mineral deposits and the changing geography of ice and sea.

That distinction matters. Ireland at this depth of time was not the wooded island of later prehistory, nor a country with identifiable peoples, leaders or territories. It lay on the north-western fringe of Europe during an interval of abrupt climatic oscillation. The great ice expansion known as the Last Glacial Maximum still lay ahead, but conditions could alter sharply over centuries and millennia. The evidence permits a picture of changing cold-country ecosystems and perhaps very occasional human presence. It does not permit an account of an Irish polity, a battle, a diplomatic relationship or a settled national population.

A Shifting Cold-Stage Landscape

MIS 3 lasted broadly from about 57,000 to 29,000 years ago. It was not a single unbroken freeze. Greenland ice-core sequences reveal repeated swings between colder stadials and relatively milder interstadials, changes reflected in Irish cave deposits and sedimentary archives. At Crag Cave in County Kerry, uranium-thorium dating shows that calcite formed episodically during this wider period. Because

shallow caves normally require liquid water rather than persistently frozen ground for such mineral growth, the deposits provide evidence for intervals in which mean annual conditions were less severe than in full glacial phases. They do not, however, give a weather report for 31,664 BCE itself.

The best terrestrial environmental comparison comes from Derryvree near Maguiresbridge in County Fermanagh. Organic-rich freshwater silts, sealed between separate glacial tills, produced calibrated ages of approximately 36.9–31.7 thousand calendar years before present. The span includes the broad time denoted by this article's date, although it is far too wide to identify one particular year. Pollen, plant remains and insects from the deposit indicate an open, cold landscape, with wet ground, mosses, sedges and pools rather than closed forest. The insect evidence has been interpreted as a muskeg-like wetland rich in decaying plant matter, set within tundra or steppe-tundra conditions.

Such places were locally productive despite their severity. Open water and saturated ground could support aquatic plants, sedges and mosses; surrounding grass- and herb-rich ground could feed herbivores during favourable seasons. Yet winters were harsh, trees sparse or absent, and permafrost or seasonally frozen ground may have constrained drainage and vegetation. Ireland's regional environments would not all have been identical. Lowlands, limestone karst, uplands, river valleys and coastal margins reacted differently to cold, snow, meltwater and changing ice margins. The scattered record captures fragments of these environments rather than a complete island-wide map.

Castlepook and the Animals

For the southern part of the island, Castlepook Cave near Doneraile in north County Cork is the key site. Older excavations recovered an exceptionally varied collection of Ice Age animal bones from several cave passages, including the aptly named Hyaena Land and Elephant Hall. Modern re-dating has shown that some Castlepook material is substantially older than earlier measurements indicated. Research now places elements of the pre-Last Glacial Maximum fauna across a long range, rather than treating the cave's collection as a single event or a single living community.

The relevant fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. This is powerful evidence that Ireland was intermittently part of a wider north-west European ecological network before the Last Glacial Maximum. It was not an isolated refuge inhabited solely by a few hardy species. Recent sedimentary ancient-DNA work at Castlepook has also detected a wider set of taxa and identified genetic links between Irish mammoths and hyaenas and populations elsewhere in Eurasia. As this genetic study is presently a preprint, its detailed conclusions should remain provisional; its central value is to demonstrate the potential of undisturbed cave sediments to supplement the old bone collections.

These animals should not be imagined together in one crowded scene. Bones entered caves over long periods, and different species may have used the landscape in different seasons or climatic phases. Carnivores could carry carcass parts underground; animals could die naturally in or near caves; water and sediment could move remains; and antiquarian excavation disturbed original layers. A cave assemblage is therefore an archive with several formation histories. It can establish that animals reached Ireland, but it rarely tells us where a herd grazed on a particular day or whether a hyaena, wolf or person brought a particular bone into a chamber.

Nevertheless, the animal record allows careful inferences about everyday ecological pressures. Reindeer were adapted to mobile life in open northern landscapes. Mammoths and giant deer imply substantial seasonal plant resources, while lemmings and Arctic foxes point to cold conditions. Spotted hyaenas, known in Ireland most securely from Castlepook, were formidable social predators and

scavengers. Their presence is especially important because hyaena activity may explain why bones accumulated in caves. The landscape around Doneraile was therefore not empty wilderness but an active food web, in which grazers, browsers, predators and scavengers moved through a changing mosaic of open ground, wet places and limestone shelter.

The Reindeer Femur Question

A single object gives this period unusual archaeological importance: a reindeer femur from Castlepook. It has been publicly dated to about 31,000 BCE and bears a deep mark that zooarchaeologist Ruth Carden interprets as having been made with a sharp stone implement during carcass processing. If this interpretation is confirmed, it would indicate that a person or small group handled a reindeer in Ireland during the Upper Palaeolithic, far earlier than the long-established record of post-glacial settlement. The possibility is significant precisely because Irish evidence for people at this time is so scarce.

But the qualifications are inseparable from the claim. The femur comes from an old cave collection, not from a modern excavation of an intact occupation floor. No securely associated stone-tool assemblage, hearth, dwelling, grave, ornament, art panel or repeated food-processing area of comparable age has been recovered at Castlepook. A radiocarbon determination dates the animal's death, not automatically the moment of marking, the place of killing or the identity of whoever made the mark. Nor can one modified bone establish whether visitors crossed during a single favourable episode, returned seasonally, lived nearby for years, or left descendants.

It is therefore safest to describe the femur as possible evidence of Upper Palaeolithic butchery, not proof of permanent settlement. The distinction is more than cautious wording. A travelling hunting party could have visited an accessible edge of Ireland, processed an animal, and disappeared from the archaeological record. Conversely, natural damage and the complicated history of cave deposits demand continuing microscopic and contextual scrutiny. Renewed excavation at Castlepook in 2022 located surviving cave sediments and identified areas of potential, offering a route by which future work may test the older interpretations more securely.

People Without a Political Record

There is no evidence from Ireland around this horizon for named communities, borders, chiefs, councils, warfare or diplomacy. It would be misleading to project later tribal or national identities backwards into a time before any demonstrated continuous human population on the island. If the Castlepook mark records human action, the makers were almost certainly mobile Upper Palaeolithic hunter-gatherers belonging to wider social worlds in Britain or continental north-west Europe. That is an interpretation based on comparative archaeology, not an excavated Irish camp.

Across Europe, groups of this broad era used carefully made stone tools, depended on extensive social connections, and in some regions created personal ornaments, imagery and cave art. None of those cultural practices has yet been securely demonstrated in Ireland at 31,664 BCE. Reindeer, if hunted or scavenged, could have supplied meat, marrow, hide, sinew and bone. Yet even that practical reconstruction exceeds what the femur alone proves: the mark cannot tell whether flesh was removed, tendons cut, hide detached or marrow sought. There is no Irish evidence at this date for farming, herding, metalworking, pottery, trade in finished goods, formal religious monuments or literacy.

The most meaningful ‘economy’ visible here is ecological movement. Faunal genetic connections and the presence of large mammals show that routes existed, intermittently, between Ireland and neighbouring parts of north-west Europe before the Last Glacial Maximum. Lower sea levels changed coastlines, but exact routes remain debated and should not be simplified into a guaranteed dry land bridge. Ice, exposed shelves, shallow water, temporary islands and coastal corridors could each have shaped access differently at different times. Animals demonstrably made the journey; human movement remains possible but poorly evidenced.

What This Date Can Mean

31,664 BCE thus marks neither an Irish founding moment nor an event that can be narrated year by year. It belongs to a broad, unstable interval in which Ireland supported cold-adapted mammals and patchy tundra wetlands before the maximum spread of the last ice sheet transformed much of the island. Derrynvree provides the environmental frame; Crag Cave demonstrates millennial climatic variability; Castlepook supplies the most vivid faunal record and the tantalising reindeer femur. Together they show an Ireland connected to Ice Age Europe by ecology and geography, but not yet known through a settled human history. The evidence is thin, difficult and incomplete. Its importance lies in what it responsibly reveals: an inhabited animal landscape, a changing climate, and a still unresolved question over the earliest people to reach the island.

Chapter 038 of 100

31663 BCE

Maguiresbridge Bogbean Pool^[38]



The label 31,663 BCE is a modern way of arranging a period for which Ireland has no written dates, named communities or recoverable annual events. It must not be treated as a year in the ordinary historical sense. In archaeological terms it falls roughly 33,600 calendar years before present, where “present” is conventionally AD 1950, within the later part of Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. At such depth in time, radiocarbon results require calibration and commonly produce ranges spanning many centuries or millennia. The evidence can illuminate an Irish world around this horizon; it cannot tell us what happened in one particular calendar year.

An Interval, Not an Anniversary

The appropriate framework is the Middle Midlandian, the Irish term for part of the last cold stage. This was before the fullest development of the Last Glacial Maximum, when the British–Irish Ice Sheet later covered much of Ireland. It was nevertheless an age of profound climatic severity and rapid change. Ice margins advanced and withdrew; sea level, coastlines and drainage altered; plant and animal communities expanded into favourable ground and disappeared when conditions worsened. Ireland was not simply a fixed white island beneath permanent ice, nor was it a familiar green landscape awaiting settlement. It was a shifting north-western edge of Ice Age Europe.

Modern reconstructions show why caution is needed. The British–Irish Ice Sheet was not one unchanging blanket with a single date of formation. Its centres of accumulation, outlet glaciers and margins behaved differently in different regions. Evidence from caves, sub-glacial sediments, landforms and offshore cores indicates that parts of Ireland retained ice-free or seasonally non-glacial environments during portions of MIS 3, before more extensive ice growth. Yet no available reconstruction can map the

precise margin, shoreline or weather of every Irish district in 31,663 BCE. The important historical fact is variability: an environment capable of sustaining freshwater habitats and large mammals could, over geological time, be engulfed or transformed by renewed glaciation.

A Freshwater Archive Beneath Ice

The strongest Irish evidence relevant to this broad horizon comes from Derryvree near Maguiresbridge, County Fermanagh. Road construction in 1969 cut through a drumlin and revealed a sequence of freshwater silts, fine sands and organic layers trapped between two tills. Till is sediment laid down directly by glacier ice. The order of the strata therefore preserves an eloquent, if incomplete, history: an earlier glacial episode deposited the lower till; an interval of open water and wet ground followed; later ice spread across the area and buried the freshwater deposits beneath another till.

Organic material from the Derryvree sequence produced a conventional radiocarbon age of 30,500 years BP, with a substantial laboratory uncertainty. Calibration has been understood to place the deposit broadly within about 36,900–31,700 calibrated years BP. That wide range encompasses the approximate horizon represented by 31,663 BCE, but it does not establish that the pond, its plants or its insects belong to that exact numbered year. Nor should a single sampled layer be imagined as a continuous diary. What Derryvree securely demonstrates is that south Fermanagh experienced a cold, freshwater and non-glacial interval between separate phases of ice deposition.

This distinction matters because later glaciers removed, mixed or concealed much of Ireland's earlier Pleistocene record. At Derryvree, later ice was destructive in one sense but protective in another: it sealed a fragile environmental archive below a drumlin. The deposit allows modern researchers to reconstruct a landscape through small and durable traces—pollen, plant macrofossils, mosses and insects—rather than through buildings, tools or historical testimony.

Sedges, Mosses and Open Water

Derryvree was not a forest. Its biological remains indicate open tundra or muskeg: wet, cold ground with pools, mossy margins, sedges, grasses, herbs and low-growing shrubs. The record includes bogbean, an aquatic or wetland plant, along with water-milfoil and Arctic-alpine species such as mountain avens. Freshwater mosses and the insect assemblage reinforce the picture of shallow water, plant-rich mud and damp ground in a periglacial climate. Periglacial means shaped by intense frost and thaw close to ice, rather than necessarily lying beneath a glacier.

The word tundra should not suggest a lifeless, uniformly snowbound plain. Summers, though short, could support productive wetland edges and herb-rich patches; local shelter, drainage, soil and exposure would have created small ecological differences. But the evidence does imply severe winters, sparse dry-land vegetation and an absence of mature woodland. A few grains of tree pollen do not prove nearby trees: pollen can travel far, while the wider assemblage points firmly towards an open landscape. This was an Ireland in which water, frost, wind and seasonal light governed daily ecological rhythms.

Other Fermanagh sites strengthen the regional case while also showing the limits of chronology. At Greenagho near Belcoo, organic material beneath till has been dated to an earlier part of MIS 3, although the determination is treated cautiously. Hollymount, also near Maguiresbridge, preserves another inter-till freshwater deposit. Together these sites show that north-central Ireland had a more complicated Ice Age

history than a simple advance-and-retreat narrative. They do not, however, license the claim that every part of the island was simultaneously ice-free, or that all three deposits belonged to one uninterrupted landscape.

The North Cork Animal World

Far to the south, Castlepook Cave—also called Mammoth Cave—near Doneraile in County Cork preserves a different kind of evidence. Excavations conducted in the early twentieth century recovered more than 2,000 bones from a complex limestone cave system. The assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, as well as wolf, Arctic fox, mountain hare and lemmings. Taken together, these animals indicate that Ireland could at times support, or be reached by, a cold-adapted and open-country fauna strikingly unlike that of later historic Ireland.

Castlepook must be read carefully. It was not a neatly sealed settlement layer. Individual bones span a long interval, and the cave's deposits were affected by water movement, carnivore activity and antiquarian excavation methods that did not meet modern standards. A spotted-hyena den or scavenging place can accumulate bones from animals brought in as food, from carcasses dying nearby, and from material moved after deposition. The cave is thus exceptionally important evidence for regional fauna, but it cannot be treated as a census of animals alive together on a single day, still less as a direct view of a human camp.

Recent re-dating has also altered the picture. Improved pretreatment and accelerator radiocarbon techniques showed that some older cave measurements were too young, pushing elements of the southern Irish MIS 3 fauna further back in time. This is a useful warning against attaching false certainty to any one date. Castlepook demonstrates a long-lived faunal archive before and around the onset of the great ice-sheet expansion; it does not supply a year-by-year chronology of Ice Age Cork.

A Possible Human Trace

A reindeer femur from Castlepook has attracted special attention because a deep surface mark has been interpreted as a cut made by a stone tool during butchery. The bone has been presented as evidence for human activity in Ireland roughly 33,000 years ago, making it broadly relevant to the era considered here. If that interpretation is confirmed, it would move the evidence for people in Ireland dramatically earlier than the well-established late Upper Palaeolithic traces known elsewhere on the island.

The claim remains important but limited. The radiocarbon determination dates the animal bone, not the moment when a mark was made or the duration of any visit. The specimen comes from an old cave collection rather than a modern excavation of an intact occupation surface. No associated hearth, secure stone-tool assemblage, dwelling, human bone, burial, artwork or repeated sequence of butchered animals has yet established a resident community in Ireland at this time. Carnivore damage, sediment abrasion and other post-depositional processes must be distinguished from tool use by specialist analysis. The responsible conclusion is therefore that Castlepook offers a potentially significant indication of Upper Palaeolithic human presence, not proof of a known population, named people or permanent settlement.

What Cannot Be Recovered

There is no evidence from 31,663 BCE for political institutions, rulers, territories, diplomacy, warfare or alliances in Ireland. Predators competed with prey and hyenas processed carcasses, but these are ecological relationships, not human conflict. Likewise, no material supports claims about religion, ceremonies, language, kinship rules, artistic traditions, teaching or formal learning. It would be misleading to fill this silence with imagined Ice Age clans, shamans or tribal boundaries.

Economy and trade are similarly beyond direct recovery. If people did reach Ireland, reindeer and other large mammals could have provided meat, hides, sinew, bone and antler, while dry vegetation or wood collected elsewhere might have served as fuel. Those are possibilities informed by wider Upper Palaeolithic practice, not demonstrated Irish facts. There is no evidence here for exchange networks, boats, campsites, seasonal routes or a settled hunting economy. Even the routes by which mammals, and perhaps people, reached the island remain difficult to reconstruct because changing sea level, glacial loading and ice cover continually reshaped the surrounding region.

Ireland's Most Distant History

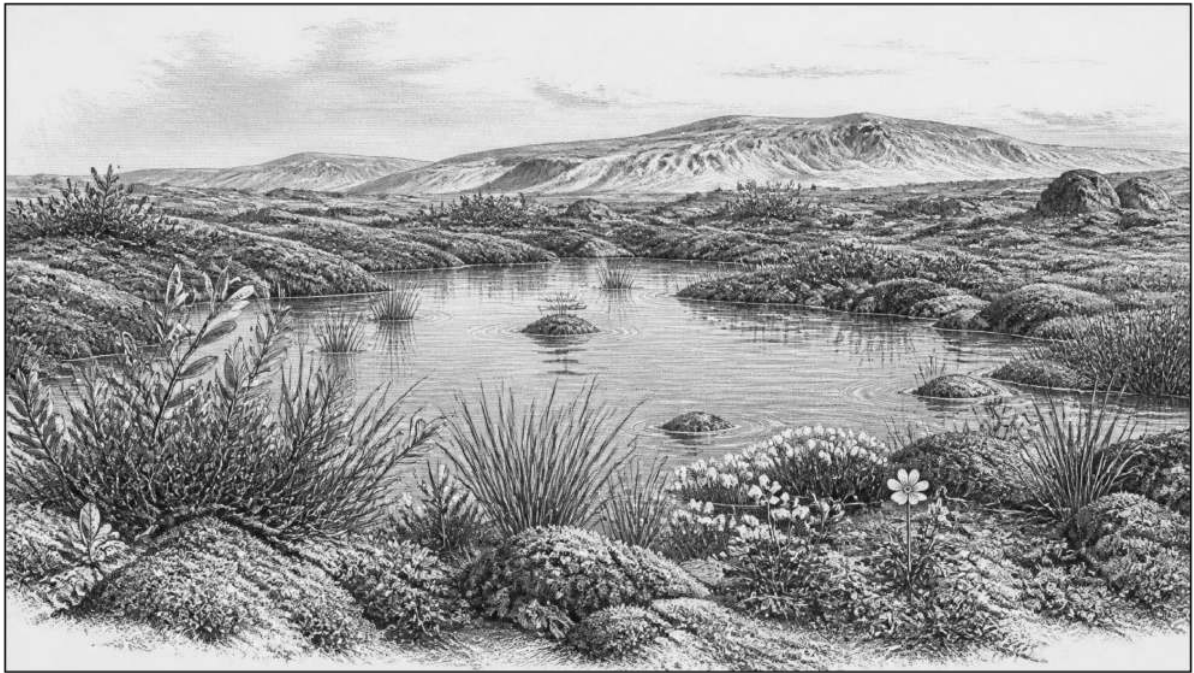
The significance of this horizon lies not in an invented event but in the survival of evidence. At Derryvree, a cold freshwater basin preserved the remains of plants and insects before a later ice advance entombed them. At Castlepook, a cave accumulated bones that reveal an unexpectedly rich Ice Age fauna and perhaps a human encounter with reindeer. At Crag Cave in County Kerry, episodes of speleothem growth indicate intervals when liquid water could percolate through the cave system during the wider last glacial cycle. These archives show a dynamic Ireland, environmentally connected to the changing North Atlantic world but archaeologically difficult to see.

Around the modern label 31,663 BCE, Ireland's history is therefore principally environmental history: wetlands under frost, open vegetation, large grazing animals, carnivores, caves and approaching ice. The island was neither empty of life nor available to historical narration in the usual sense. Its inhabitants, if people were among them, remain unnamed and uncounted. What survives is more fragmentary but no less remarkable: sediment beneath a drumlin, a seed in ancient mud, and a marked reindeer bone whose meaning is still being tested.

Chapter 039 of 100

31662 BCE

The Derryvree Seedbed ^[39]



Modern calendar-year precision is not available for Ireland in 31,662 BCE. No inhabitants of the island used a numbered calendar, and archaeology cannot isolate a political decision, a journey or a seasonal event to this single modern year. The label is best treated as a point of orientation: roughly 33,611 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a climatically unstable phase of the last Ice Age. The responsible history of this moment is therefore a history of ranges, deposits and probabilities. It concerns an Ireland that was repeatedly reshaped by cold, ice and changing sea levels, and for which the most revealing evidence is environmental rather than documentary or monumental.

A Broad Chronological Horizon

The nearest well-dated northern Irish environmental sequence comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed fine freshwater sands and organic silts enclosed between two tills: deposits left by ice before and after an interval in which water, plants and animals occupied the site. Organic material from the freshwater bed returned a conventional radiocarbon age of about 30,500 years BP, with a substantial laboratory uncertainty. When such a determination is calibrated against changing atmospheric radiocarbon levels, it belongs broadly within a range of approximately 36,900–31,700 calibrated years BP. That range encompasses 31,662 BCE, but does not turn the Derryvree sediments into a record of that exact year.

This distinction matters. A radiocarbon result dates the death of organic material within an uncertainty range; a sedimentary bed may have accumulated over generations or far longer; and calibration converts radiocarbon years into an estimate of calendar age rather than a date-stamped historical episode.

Derryvree can responsibly illuminate the environmental world around this remote horizon. It cannot tell us who, if anyone, stood beside its water on a particular day in 31,662 BCE.

The wider chronology confirms that this was not yet the Last Glacial Maximum. The British–Irish Ice Sheet reached its local maximum extent later, around 27,000 years ago, while the global maximum of ice volume and low sea level lay broadly between 26,500 and 19,000 years ago. At the earlier Derryvree horizon, parts of Ireland were demonstrably free of overriding ice, although conditions varied sharply between regions and changed repeatedly through time. The familiar image of an entirely ice-covered Ireland is therefore unsuitable for this date; equally unsuitable is any picture of a mild, fully wooded island.

Freshwater Beneath the Drumlin

Derryvree is important because it preserves a natural archive that later glaciation sealed beneath a drumlin. The lower till records an earlier incursion of ice. Above it, freshwater sediment formed in a landscape no longer covered by glacier ice. A later advance spread the upper till across the site, protecting but also burying the evidence. This sequence demonstrates profound regional environmental change: ice gave way to an open, wet landscape and then returned. It does not prove that all of Fermanagh, still less all Ireland, looked identical at any one time.

The plant and animal traces from the freshwater deposits indicate a cold, open and largely treeless setting conventionally described as tundra or muskeg-like wetland. Mosses, sedges, grasses, herbs and low-growing plants occupied damp margins and patches of better-drained ground. Fossils attributed to dwarf willow, mountain avens, bogbean and alternate water-milfoil are especially revealing. Dwarf willow and mountain avens point towards cold, exposed conditions; bogbean and water-milfoil indicate freshwater pools, shallow water or saturated ground. These remains show that severe cold did not make the landscape lifeless. Rather, it created a patchwork in which plants suited to short growing seasons could thrive where moisture, soil and shelter permitted.

Some pollen from the deposit has been difficult to preserve and interpret. Small quantities of tree pollen cannot, by themselves, demonstrate nearby forest, because grains can travel considerable distances or be redeposited. The combined evidence of plant macrofossils, mosses and cold-environment insects is more persuasive than an isolated pollen grain: Derryvree was not an oak-and-hazel woodland of the later Holocene. It was open ground, shaped by frost, seasonal waterlogging and a short productive summer. The term *periglacial* is useful here: it denotes a landscape affected by intense freezing and thawing close to ice-sheet conditions, not necessarily one lying directly beneath a glacier.

Cork Caves and Ice-Age Animals

North Cork provides a different, complementary window. Castlepook Cave near Doneraile, historically called Mammoth Cave, contains Ireland's richest known assemblage of vertebrate remains from the long period leading towards the Last Glacial Maximum. More than 2,000 bones recovered from its galleries represent a lengthy and complicated history rather than a single animal community or hunting episode. Improved radiocarbon pretreatment has shown that several older determinations required revision, and the dated remains span roughly 45,700 to 19,950 radiocarbon years BP. The cave is consequently an archive of changing faunas, not a photograph of Ireland in one year.

Its fauna nevertheless establishes that Late Pleistocene Ireland could support, at different times, animals now absent from the island: woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. The hyaena evidence is a particular warning against easy assumptions. Caves can be carnivore dens and bone traps. Hyenas, water movement, sediment disturbance and early excavations may all alter the position and survival of bones. A cave assemblage cannot automatically be read as the refuse of human hunters.

One Castlepook reindeer femur has made the question of people in Ireland around this broad period especially significant. Ruth Carden identified a deep incision on the bone as consistent with cutting by a sharp stone tool during carcass processing; County Cork heritage material places the bone broadly around 30,000 BCE. If that interpretation is sustained, it is potentially the earliest evidence that humans handled an animal in Ireland. Yet its evidential limits must be stated plainly. No securely associated stone-tool assemblage, hearth, dwelling surface, human burial or repeated butchery area of comparable age has been recovered there. The bone is evidence; the diagnosis of the mark and its attribution to people are specialist interpretations. It supports the possibility of a brief human visit, not a claim for established settlement.

Movement Without States

Nothing presently known for this horizon permits a history of Irish political affairs, diplomacy, named communities or organised warfare. There were no written institutions, rulers or borders to recover, and no evidence for a local state of any kind. Nor can trade, language, religious practice, art, education, kinship rules or burial custom be reconstructed for Ireland at 31,662 BCE. Silence in these areas is not proof that human beings were incapable of such social life elsewhere in Upper Palaeolithic Europe; it is a statement about what the Irish evidence does and does not preserve.

If the Castlepook incision was made by a person, the most restrained inference is that one or more highly mobile hunter-gatherers may have reached Ireland during a comparatively favourable phase of the Ice Age and processed a reindeer. Reindeer were valuable animals in northern Eurasian hunter-gatherer economies, but that broader comparison cannot supply missing Irish evidence of camps, clothing, weapons, boats or social organisation. There is no basis for assigning the visitor to a named archaeological culture, imagining a permanent Cork settlement, or connecting them directly with Ireland's much later Mesolithic inhabitants.

Routes into and through this changing north-western European world remain uncertain. Sea level was lower than today, and coastlines, exposed shelves, ice margins and channels differed greatly from modern maps. However, the available Irish deposits cannot determine whether animals or any people moved by exposed coastal terrain, across temporary land connections, over ice, or by water. The same caution applies to economy. Derryvree shows potentially productive summer wetlands and open vegetation; Castlepook shows that substantial mammals reached the island. Neither proves regular hunting territories, exchange networks or a resident population.

Regional Change and Future Questions

Fermanagh and Cork should not be collapsed into one imagined landscape. Derryvree records freshwater and tundra vegetation in the north; Castlepook preserves a time-mixed cave fauna in the south. Together they demonstrate an Ireland of ecological opportunities amid powerful constraints: cold winters,

periglacial ground, fluctuating ice margins and eventually the far more extensive glaciation of the Last Glacial Maximum. Later ice probably destroyed, reworked or buried much of the archaeological evidence that a short-lived human presence might have left.

The most important development around 31,662 BCE is therefore not a dated human event but the survival of fragile evidence. Beneath a Fermanagh drumlin, seeds and silts preserve an ice-age wetland. In a Cork cave, animal bones preserve a record of vanished faunas and a contested but consequential possible human trace. Further excavation, direct dating and microscopic study may refine this picture. For now, the historical conclusion is both modest and remarkable: Ireland was a cold but biologically active place, intermittently habitable in ecological terms, while the question of whether people briefly entered that world remains open rather than settled.

Chapter 040 of 100

31661 BCE

Derryvree's Arctic Sandwort^[40]



“31,661 BCE” is a modern label imposed on a time far beyond written history. No community in Ireland recorded a year, season, ruler or event by which this point can be fixed. In archaeological terms it falls approximately 33,600 calibrated years before present, where “present” conventionally means AD 1950, but that conversion must not suggest false precision. At this depth of time, radiocarbon measurements have substantial uncertainties, calibration produces ranges rather than exact dates, and deposits often record prolonged episodes. The responsible subject is therefore Ireland during a broad span around this nominal year, not an invented event in one calendar year.

That span belongs to the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), a climatically unsettled interval of the last Ice Age. Ireland’s evidence is exceptionally fragmentary. It consists chiefly of sediments, fossil plants and insects, cave bones, landforms and chemical dates. It does not provide a named population, a settlement plan, a political boundary or a continuous human story. Yet one freshwater deposit beneath a drumlin in County Fermanagh offers an unusually vivid, if local, view of the sort of Irish environment that existed during part of this period.

A Wetland Beneath the Drumlin

In 1969 road works cut through a drumlin at Derryvree, near Maguiresbridge in south Fermanagh. Beneath later glacial deposits, investigators found silts and fine sands laid down in freshwater, sandwiched between two thick tills. The sequence matters because the upper till demonstrates that ice later crossed the locality, while the intervening organic-rich beds preserve a landscape that existed before that renewed advance. A conventional radiocarbon determination of 30,500 +1,170/–1,030 years BP from

the deposit has subsequently been expressed as a broad calibrated range of roughly 31,700–36,900 cal BP. The nominal year in this article falls within that wide interval, but cannot be matched to a particular layer, day or generation at Derryvree.

The recovered evidence points to an open, cold and periglacial environment: ground shaped by repeated freezing and thawing near an ice margin, rather than a familiar green and wooded Ireland. Pollen was poorly preserved, but it was mainly herbaceous. Plant macrofossils and mosses included species associated with cold northern or alpine habitats. Fossil records from the deposit include mountain avens (*Dryas octopetala*), Arctic sandwort (*Arenaria ciliata*) and bogbean (*Menyanthes trifoliata*). Sedges, moss-rich ground and patches of shallow water formed a wetland mosaic. The original investigators compared it to muskeg: waterlogged, organic ground broken by pools, not a uniform lake or a simple grassland.

This was not necessarily bleak in every sense. During the brief growing season, wet ground could support specialised plants, insects and grazing animals. But it was a landscape of exposure, frost, short summers and sparse dry-ground cover. Trees were either absent locally or too scarce to form woodland. Occasional pollen grains of pine or hazel do not overturn that conclusion; they may have travelled far on the wind or derived from reworked material. The evidence supports tundra-like vegetation around the wetland. It does not license an exact reconstruction of the whole island's plant cover, still less a weather report for 31,661 BCE.

Ice, Water and Uncertain Coasts

At this date Ireland stood in the long approach to the Last Glacial Maximum, not necessarily at its coldest or most extensively ice-covered moment. The maximum phase came later, principally during MIS 2. Earlier ideas of a single, simple advance have been replaced by a picture of a dynamic British–Irish Ice Sheet, growing and retreating in response to repeated climatic shifts. Recent synthesis suggests that ice may have developed substantially before the global maximum, including advances and retreats during MIS 3; the precise extent of ice over Ireland at any one time remains debated because securely dated pre-maximum till is rare.

Derryvree therefore proves something important but limited. It demonstrates that this part of Fermanagh was ice-free long enough for a freshwater deposit and its living community to form before later ice buried it. It does not prove that all Ireland was simultaneously ice-free, nor that its coasts, mountains and western lowlands experienced identical conditions. Crag Cave in County Kerry supplies a complementary clue: episodes of calcite growth in the cave during MIS 3 required liquid water and conditions not persistently below freezing. Together, cave calcite and buried wetland sediments show climatic oscillation rather than a single unchanging frozen landscape.

Lower global sea levels altered the geography of the Irish region, exposing parts of the continental shelf and changing the size and configuration of coastal plains. Whether a particular route between Ireland, Britain and continental Europe was dry, marine, marshy or obstructed by ice depended on the phase in question. The safe conclusion is that the island's ecological connections were different from those of the modern Irish Sea. There is no evidence, however, for a mapped route, a regular crossing system or a maritime economy in Ireland at this time.

The Cave-Animal Record

Southern Irish caves preserve another kind of evidence. Castlepook Cave, near Doneraile in north County Cork, is Ireland's richest known pre-Last Glacial Maximum vertebrate archive. Excavations between 1904 and 1918 recovered more than 2,000 bones from passages given evocative names including Hyaena Hall and Elephant Hall. The fauna includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Direct dates from individual bones extend across a long interval, broadly from about 45,700 to 19,950 radiocarbon years BP.

Those bones establish that Ice Age animals occupied parts of Ireland at different times during the last cold stage. They do not show that every listed species shared one valley in 31,661 BCE. Cave deposits accumulate slowly and irregularly; carnivores carry in prey, water moves sediment, and later excavation can disturb relationships between finds. Improved ultrafiltration methods have also shown that several older Irish cave radiocarbon determinations were inaccurate, with some Castlepook samples returning dates thousands of years older than their earlier measurements. The lesson is methodological as well as historical: a cave collection must be read bone by bone, context by context.

Even so, the animal record makes the Derryvree wetland intelligible within a wider Ice Age world. Reindeer and lemmings are consistent with open, cold habitats; hyaenas, wolves and bears indicate large-ranging carnivores and complex food chains; mammoth and giant deer speak to the intermittent presence of large herbivores. These were not domestic herds or managed game. There is no evidence for farming, herding, field boundaries, crop cultivation or permanent animal ownership. The economy visible in the fossils is ecological, not agricultural.

A Possible Human Trace

The most arresting, and most disputed in implication, item is a reindeer femur from Castlepook. County Cork heritage material describes a deep mark on it as consistent with the use of a sharp stone implement during butchery, and presents the bone as dating to about 31,000 BCE. If the mark is correctly identified as human-made and contemporary with processing of the fresh carcass, it would be evidence that people reached Ireland in the Upper Palaeolithic, vastly earlier than the well-established post-glacial archaeological record.

That proposition must be stated narrowly. The femur is not a settlement. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, human bone, food-preparation area or stratified occupation surface of comparable age has been identified in Ireland. Its cave context is difficult, and the date of the animal does not automatically date the modification, identify the person who made it, or tell where the reindeer was killed. A single marked bone can support the possibility of carcass processing; it cannot demonstrate a resident population, continuous occupation or a named culture.

It is consequently unsafe to call any possible visitors "Irish" in an ethnic, linguistic or political sense. They cannot be assigned to later Gaelic, Celtic or tribal identities. Nor can an Irish Gravettian or Aurignacian community be inferred merely because such cultural traditions are known elsewhere in Europe. People on the European mainland and in Britain used sophisticated stone technologies and, in some regions, made art and ornaments during the Upper Palaeolithic; that is valuable context, not evidence that equivalent objects or practices existed in Ireland.

No Politics, No Proven Diplomacy

Political affairs, warfare and diplomacy leave no trace here because there is no evidence for states, chiefs, territories, treaties or organised armed conflict in Ireland around this horizon. A small, mobile hunting party—if one was present—would have organised food-sharing, movement and care within a social group, but this is a general inference from human lifeways, not a documented Irish institution. The same restraint applies to religion and learning. There are no Irish monuments, burials, images, ritual deposits, writing systems or formal teaching places that can be securely dated to this period.

What can responsibly be said about everyday life is conditional. Any people who briefly entered this cold landscape would have needed seasonal knowledge: where animals moved, where water remained available, how weather affected travel, and how to manage clothing, fire and stone tools. Reindeer, if hunted or scavenged, could have provided meat, hides, sinew and bone. Yet none of these uses is directly demonstrated at Derrynree or Castlepook. There is equally no direct evidence for exchange between groups. The broad north-west European setting makes mobility plausible; Irish evidence does not reveal its scale or direction.

A Landscape More Durable Than Memory

The chief development around 31,661 BCE was environmental, not political: an unstable Ice Age landscape in which wetlands, tundra vegetation, animal corridors and expanding ice repeatedly rearranged the possibilities for life. Later glaciation destroyed, buried or reworked much of the record, helping to explain why the human past is so much harder to see than the geological past. Derrynree's plants preserve an interval when cold freshwater habitats endured beneath an ultimately transient sky; Castlepook's bones preserve animal lives drawn into a cave over millennia.

For Ireland at this remote point, the honest history is therefore one of evidence and limits. There may have been a human encounter with a reindeer carcass in the broader period. There certainly were changing cold-stage environments and Ice Age animals. But there were no recoverable annual events, no known leaders and no demonstrable society from which to write a conventional chronicle. The Arctic sandwort beneath the Fermanagh drumlin is more eloquent than any imagined king: a small fossil witness to an Ireland still being remade by frost, water and ice.

Chapter 041 of 100

31660 BCE

Derryvree's Permafrost Garden^[41]



“31,660 BCE” is a modern way of placing a point in deep time, not a date that people in prehistoric Ireland could have recognised or recorded. It corresponds roughly to 33,610 years before AD 1950, the conventional reference point for radiocarbon chronology. No evidence can resolve events in Ireland to that individual year. The responsible frame is therefore a broad one: the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, when Ireland’s landscapes, sea routes and ice cover were changing on millennial rather than annual timescales.

The closest well-dated Irish environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. There, road works exposed organic silts and fine sands trapped beneath a drumlin. The deposit yielded a conventional radiocarbon age of $30,500 \pm c.1,100$ radiocarbon years BP; calibration places it broadly between about 36,900 and 31,700 calendar years BP. Thus 31,660 BCE lies at, or just beyond, the young end of this wide range, not at a securely identifiable horizon. The deposit is nevertheless unusually valuable: it preserves a glimpse of an Irish landscape shortly before the last great expansion of the Irish Ice Sheet.

An Open, Bitter Landscape

Derryvree was not a wooded version of modern Fermanagh. Pollen, plant macrofossils, mosses and insects indicate open tundra or muskeg: a cold, wet, largely treeless terrain with sedges, grasses, herbs, dwarf shrubs and patches of moss around shallow pools. The term *muskeg* denotes waterlogged, peat-forming ground with a complex mixture of open water and vegetation. It should not be imagined as a uniform frozen desert. In sheltered hollows there were freshwater habitats and decaying plant matter; across exposed ground, however, vegetation was probably sparse and the growing season short.

Periglacial conditions shaped this country. That means a climate associated with intense freezing and thawing near an ice-sheet margin, whether or not a particular location lay beneath glacier ice at a particular moment. Frozen ground, seasonal meltwater, unstable slopes and wind-blown sediment affected drainage and soils. The drumlin that later sealed the Derryvree sediments is itself part of the much younger-looking but immensely consequential glacial legacy that dominates Ireland's physical geography. Around this date, the evidence indicates that north-central Ireland had still been ice-free within the broad Derryvree interval, but conditions were deteriorating as regional ice expanded.

Ireland Before Complete Ice Cover

The precise advance history of the last Irish Ice Sheet remains an active research problem, and it is important not to turn a general reconstruction into a fixed map for one notional year. Recent syntheses broadly place the build-up of the last British–Irish Ice Sheet between about 34,000 and 27,000 calendar years BP, with its maximum extent later, approximately 27,000–23,000 calendar years BP. At that maximum, ice covered Ireland and extended across much of its surrounding shelf. The Derryvree and Greenagho deposits show that, before this culmination, at least parts of Ireland retained exposed land, freshwater settings and tundra vegetation.

At roughly 33,610 calendar years BP, therefore, Ireland was neither reliably the familiar modern island nor demonstrably a single unbroken white ice cap. Lower global sea level exposed more continental shelf than today, but exposed shelf is not automatically a walkable land bridge. Glaciers, ice shelves, channels, shifting shorelines and local crustal movements complicate every reconstruction. Geological work has especially challenged easy claims of a southern Irish Sea land connection. For this period, the safest conclusion is that the geography between Ireland, Britain and continental Europe was dynamic and that animal movement was possible during favourable phases, while the exact routes remain uncertain.

The Castlepook Faunal World

County Cork offers the other major Irish line of evidence. Castlepook Cave, also known as Mammoth Cave, near Doneraile, contains one of Ireland's most important Pleistocene bone assemblages. Its deposits and historic collections include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. The assemblage does not prove that every species lived together at the same instant, nor that the cave was a settled animal community. Cave deposits accumulate over long spans and are altered by scavenging, water movement, excavation and collecting. Even so, they establish that a substantial cold-stage fauna reached southern Ireland during Marine Isotope Stage 3.

Modern re-dating has transformed this picture. Improved collagen preparation and accelerator mass spectrometry showed that several older cave-bone dates had understated the age of the Castlepook fauna by thousands of radiocarbon years. The revised results place important animals well before the Last Glacial Maximum; some evidence suggests that giant deer and spotted hyaena disappeared locally before about 40,000 calendar years BP. For the broad period around 31,660 BCE, reindeer and mammoth are more appropriate symbols of Ireland's recorded Ice Age fauna than later familiar animals such as cattle, sheep or red deer. Yet even this phrasing needs care: fossil evidence documents presence in a broad interval, not an annual census of the island.

A Reindeer Bone and Human Possibility

One Castlepook object has particular importance for human history: a reindeer femur bearing a deep linear mark interpreted as damage made during butchery with a sharp stone implement. It has been publicly reported as dating to about 33,000 years ago, close to the broad chronological setting of this article. If the modification is confirmed as human-made and contemporary with the animal's death, it would be Ireland's earliest known evidence of human activity by a very large margin. It would suggest a short visit by Upper Palaeolithic hunters who obtained and processed a reindeer, rather than a people for whom Ireland was necessarily a permanent homeland.

The distinction matters. The bone derives from an old cave collection rather than a newly excavated, securely stratified camp floor with hearths, tools, food waste and repeated occupation surfaces. There is no known house, burial, stone-tool assemblage or cultural layer in Ireland that can responsibly be assigned to 31,660 BCE. Nor can the femur identify a named people, language or political group. It is best treated as potentially momentous but limited evidence: a trace consistent with human handling of an animal, not proof of a village, a colonising population or uninterrupted settlement.

No Politics, but Real Ecologies

For this reason, conventional headings such as political affairs, diplomacy, warfare, religion and learning have no direct content at this date. There were no Irish states, chiefs, treaties, written traditions or monuments evidenced in the record. Conflict may have occurred among predators, or between any visiting hunters and dangerous animals, but archaeology cannot recover it as a historical narrative. Likewise, no ritual practice can be inferred from Derryvree's mosses or Castlepook's bones. Silence here is not a claim that Ice Age people lacked social worlds, beliefs, knowledge or culture; it is a recognition that the Irish evidence does not reveal their particulars.

Society and economy can only be approached at the scale of subsistence possibilities. Reindeer, if hunted, would have offered meat, fat, hide, sinew, antler and bone; a single carcass could be a valuable resource for a small mobile party. Mammoth remains demonstrate the presence of far larger animals, although there is no sound evidence that people in Ireland hunted them. Hyenas may have carried bones into caves or scavenged carcasses, while caves provided traps and preservation conditions for material that seldom survives in open terrain. These processes mean that Castlepook is an archive of ecological interactions rather than a straightforward hunting site.

What This Date Can Mean

The strongest history of Ireland around 31,660 BCE is consequently environmental and evidential. The island included open, cold, wet ground in Fermanagh; Ice Age mammals had reached areas such as north Cork; and the last major glaciation was gathering force, soon to erase or bury much of the earlier terrestrial record. The apparent scarcity of evidence is partly historical reality and partly preservation: advancing ice scoured landscapes, later sea-level change drowned former coastal zones, and many surviving bones were recovered before modern excavation standards.

This was a threshold rather than a year of known events. Derryvree preserves plants and insects from a periglacial wetland; Castlepook preserves animals from a changing faunal world; one marked reindeer bone raises the possibility that people briefly entered that world. Together they replace the old image of an

empty prehistory with a more demanding one: Ireland was a severe but living northern landscape, intermittently accessible, ecologically connected to wider Europe, and poised before the ice reached its greatest extent.

Chapter 042 of 100

31659 BCE

Birm-166's Tundra Basin ^[42]



“31,659 BCE” is a modern label, not a date that can be recovered from prehistoric Ireland with calendar-year precision. It corresponds broadly to about 33,600 calibrated years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a climatically unstable stretch of the Late Pleistocene. No Irish event, individual, community or season can responsibly be assigned to that particular year. The evidence instead consists of deposits with wide chronological ranges, animal bones from caves, glacial landforms and modern re-analysis of old collections. The closest dated Irish environmental archive, at Derryvree near Maguiresbridge in County Fermanagh, has a conventional radiocarbon age of $30,500 \pm$ roughly 1,100 radiocarbon years BP; published calibration places its formation broadly between about 36,900 and 31,700 calibrated years BP. The notional year falls within that broad interval, not at a pinpoint within it.

A Wetland Sealed by Ice

Derryvree is valuable because later glaciation both altered Ireland profoundly and destroyed much of the evidence for earlier landscapes. Road works in 1969 cut through a drumlin and exposed a sequence of fine sands and organic silts between two tills: unsorted sediment laid down directly by glacier ice. The lower till shows that ice had previously affected the site; the upper till shows that glacier ice returned after the freshwater deposits accumulated. Between them survives a brief geological archive of an ice-free or locally ice-free landscape: water, mud, plants, insects and small animal remains preserved in a hollow that would eventually be buried beneath a streamlined hill of glacial sediment.

That archive does not describe the whole island. It describes conditions near one Fermanagh basin during one extended period of deposition. Yet its plant and animal remains provide the soundest direct picture available for Ireland around this broad phase. They indicate open tundra vegetation and a

periglacial climate: a landscape strongly governed by freezing and thawing, short growing seasons, wet hollows and sparse cover on exposed ground. Mosses, sedges, hardy herbs and aquatic plants grew around freshwater. Fossil records of bogbean (*Menyanthes trifoliata*) and mountain avens (*Dryas octopetala*) are particularly evocative, but they should not be made to carry more meaning than they can bear. They demonstrate suitable local habitats; they do not yield a complete map of vegetation or an annual weather record.

Open Ground, Not a Forested Island

The strongest interpretation is of largely treeless, heterogeneous country. There were wet, mossy margins around shallow water, sedgy patches, herb-rich ground and drier, wind-exposed surfaces. Snow and frozen ground may have endured for long periods, while summer thaw created pools, saturated soils and shifting channels. This was not necessarily a uniform white wilderness. Tundra supports life unevenly, and sheltered low ground could be markedly more productive than a nearby ridge. But neither is there evidence for the broad woodland familiar from later post-glacial Ireland. Pollen is often fragile, mobile and capable of being redeposited; isolated tree pollen grains cannot outweigh the wider assemblage of cold-climate plant macrofossils and insects.

The future contours of Ireland were also being prepared, though not in any human sense. The island's later drumlins, rock basins, redistributed soils and modified drainage systems owed much to repeated ice advances and meltwater action. The last major British-Irish Ice Sheet had not yet reached its best-established maximum extent: evidence places the southern Irish maximum much later, around 26,000–21,000 calibrated years BP, while large-scale reconstructions show ice expansion beginning unevenly across these islands from about 31,000 years BP. At the time represented by Derryvree, therefore, Ireland contained an unstable mixture of cold open habitats, local ice masses and landscapes vulnerable to a renewed, much more extensive glaciation.

Animals at the North-Western Margin

Caves in the limestone country of north Cork supply a complementary, though differently dated and more complicated, record. Castlepook Cave near Doneraile has produced Ireland's richest known Late Pleistocene vertebrate assemblage. Re-dating has shown that some older radiocarbon determinations from the cave understated the age of material by thousands of years. The resulting record establishes that, at different points in MIS 3, southern Ireland was reached by animals including reindeer, giant deer, brown bear, wolf, arctic fox, lemmings, spotted hyaena and woolly mammoth. These finds are proof that Ireland was not biologically empty in the decades of thousands of years before the Last Glacial Maximum.

They are not, however, a census for 31,659 BCE. Cave deposits may accumulate over millennia; bones can be moved by carnivores, water, collapse, digging and later excavation. Species dated at Castlepook need not all have lived together, nor can their presence in north Cork be mechanically transferred to Fermanagh. The important conclusion is more restrained: cold-adapted and open-country mammals repeatedly entered or survived in parts of Ireland during favourable intervals. Reindeer imply grazing country and seasonal mobility; hyaenas and wolves point to predators and scavengers within a food web capable of supporting large herbivores. A mammoth bone, bear remains and giant-deer bones make this fauna striking, but they do not turn Ireland into an African-style abundance of game.

The Castlepook Human Question

The period has acquired exceptional importance because a fragment of reindeer femur from Castlepook has been reported as about 33,000 years old and as bearing a mark interpreted by zooarchaeologist Ruth Carden as modification of fresh bone by a sharp stone tool. If that diagnosis is sustained, it would be the earliest known indication of human activity in Ireland, potentially placing a person or small party here far earlier than the well-established Mesolithic settlement record. It is an exciting proposition precisely because a cut on a bone can preserve the otherwise fleeting contact between people, an animal and a tool.

But the claim must be framed carefully. The bone does not come from a newly excavated occupation surface containing a hearth, stone-tool assemblage, shelter, human remains or repeated butchery evidence. Castlepook's old excavations and the later reworking of cave sediments limit what can be inferred. A radiocarbon result dates the animal bone, while the interpretation of a surface mark as human cutting is a separate taphonomic judgement. Even accepting the mark as anthropogenic would demonstrate an episode of carcass processing, not permanent settlement, a named people, a hunting camp, or a continuous population. It cannot tell us whether the reindeer was hunted, scavenged or acquired after a predator kill. Recent investigations have sought intact, stratified Pleistocene deposits in the cave precisely because better contexts are needed to test such questions.

No Politics, No Chronicle

There is no evidence for political affairs in Ireland at this time: no rulers, territories, assemblies, diplomatic ties, warfare, law or institutional authority. Nor is there evidence for farms, fields, domesticated animals, metalworking, monuments, formal cemeteries, shrines, writing or a market economy. Such absences should not be disguised by the language of later history. The archaeological record does not permit an account of Irish "tribes", nor should the presence of large mammals be converted into a claim that communities were established beside them.

If people did enter Ireland during this part of MIS 3, comparisons with Upper Palaeolithic groups elsewhere in north-west Europe make it reasonable to suppose that they would have depended on practical knowledge of animal behaviour, stone-working, clothing, fire and social co-operation. Yet that is comparative context, not Irish evidence. No securely associated Irish lithic technology, ornament, art, dwelling or burial reveals their identity, language, beliefs, kinship system or routes of travel. The intellectually honest position is that human presence around this date remains possible and potentially supported by one remarkable bone, whereas a resident society remains unproven.

Movement and Connection

Ireland's apparent remoteness today can mislead. Global sea level was lower during the cold stages because much water was locked in ice sheets, exposing broad areas of the continental shelf. But lower sea level does not automatically demonstrate a broad, dry and dependable land bridge from Ireland to Britain at this specific time. Ice loading, crustal movement, meltwater, shallow seas and changing coastlines produced a complex palaeogeography. Scholarly reconstructions differ in details, and the evidence cannot specify whether animals — or any people — arrived across dry land, coastal corridors, seasonal ice, short sea crossings, or combinations of these routes at different times.

It is safer to describe Ireland as intermittently connected within a wider north-west European ecological zone than to draw a single route on a map. The Castlepook fauna shows that movement occurred; the Derryvree wetland shows that a cold but living inland environment existed; neither proves the exact geography of a crossing in one modernly numbered year. This distinction matters because later Irish isolation, and the much later arrival of settled communities, were not inevitable facts of nature but outcomes of changing ice, sea and climate.

What This Date Can Mean

The historical significance of this year lies not in an invented episode but in a threshold of evidence. Around 33,600 calibrated years ago, Ireland was part of a changing Late Pleistocene world: open, cold and locally wet; inhabited by a variable fauna; increasingly shaped by expanding ice; and perhaps visited by people whose trace survives, if at all, in the contested incision on a reindeer bone. Derryvree's Birm-166 horizon gives the most direct local environmental anchor, while Castlepook demonstrates the wider animal world of southern Ireland. Together they replace the old image of an entirely blank Ice Age island with something richer, but also more demanding: a landscape known in fragments, whose silences are as important as its fossils.

Chapter 043 of 100

31658 BCE

Castlepook's Cut Reindeer^[43]



The label 31,658 BCE is a modern device, not a year that anyone living in prehistoric Ireland could have named or recorded. There were no calendars, writing systems, states or historical chronicles on the island. Archaeology cannot isolate events in Ireland to this particular year. It can, however, place it within the Late Pleistocene, broadly Marine Isotope Stage 3, when climate repeatedly shifted between relatively milder intervals and severe cold. The responsible history of this notional date is therefore a history of ranges, deposits and probabilities rather than a dated episode.

In calendar arithmetic, 31,658 BCE lies roughly 33,600 years before the conventional radiocarbon reference year of 1950. That should not be confused with a radiocarbon age of 33,600 BP: radiocarbon years and calibrated calendar years are different measures. The closest Irish evidence is concentrated at Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. County Cork heritage material assigns one marked reindeer femur approximately to 31,000 BC. Yet the wider Castlepook animal collection spans many millennia, and individual radiocarbon determinations must not be made to describe a single moment, season or community.

A Cave Archive, Not a Settlement

Castlepook is Ireland's most important known archive of mammal life before the Last Glacial Maximum. Excavations conducted between 1904 and 1908, under the auspices of the Royal Irish Academy's cave-exploration work, recovered a very large bone assemblage from its limestone passages and chambers. Its evocative early excavators' names, including Hyena Hall and Elephant Hall, reflect discoveries of animals that seem startling in a modern Irish setting. The surviving material is now principally associated with the National Museum of Ireland's Natural History collections.

The cave was not a neatly sealed prehistoric campsite. Bones entered it through more than one process and at more than one time. Carnivores could drag in prey or scavenged carcass parts; animals could die in or near fissures; water could rework sediments; and early twentieth-century excavation inevitably removed much contextual detail now expected from field archaeology. The cave's evidence is consequently powerful for showing that certain animals occurred in Ireland, but weaker for reconstructing exactly how they arrived, interacted, or were deposited.

The dated sequence demonstrates that Castlepook has considerable time depth. The Irish Quaternary Fauna Project obtained conventional radiocarbon ages from specimens ranging from more than 45,000 BP to roughly 20,000 BP, including reindeer, brown bear, giant deer, mammoth, wolf, Arctic fox, lemmings and spotted hyaena. Geological Survey Ireland summarises a still broader set of individual bone dates, about 45,700 to 19,950 BP. These are not a census of animals living together. They record intermittent survival and accumulation across a changing Ice Age landscape.

The Mark on the Femur

A single reindeer femur makes Castlepook especially relevant to this period. Re-examination of the bone identified a deep mark interpreted as having been made by a sharp stone tool during butchery. County Cork's heritage publication presents the object as a Palaeolithic reindeer bone of about 31,000 BC and attributes the assessment to the palaeozoologist Ruth Carden. If that identification remains secure, it is potentially the earliest currently claimed evidence that people handled an animal in Ireland: a remarkable extension backwards from the long-established record of post-glacial human presence.

Its significance should not be overstated. A cut-marked bone is evidence of an action on an animal, not automatically evidence of a settlement. The date measures the age of the animal bone, not the precise instant at which a mark was made. The cave has yielded no securely associated hearth, stone-tool assemblage, dwelling floor, human burial, food store or concentration of butchered remains that can demonstrate a camp at this age. Nor does one bone establish continuous occupation, a population size, language, ancestry, named people or a route by which any visitor reached the island.

The most careful conclusion is narrower and more interesting: people may have reached Ireland during an earlier, habitable phase of the last Ice Age and processed at least one reindeer carcass. The animal may have been killed elsewhere and its remains later carried into the cave by hyaenas or wolves, as the County Cork account itself allows. Whether the person or group was briefly passing through, hunting locally, scavenging a carcass, or part of a wider pattern of visits remains unknown. Finding diagnostic stone tools in securely dated deposits would transform the discussion.

Open Country Before the Ice Maximum

At this time Ireland was not yet the wholly ice-covered island of the Last Glacial Maximum. Reconstructions place the full Irish and British-Irish ice-sheet maximum later, broadly around 27,000–23,000 calibrated years BP, although ice expansion and maximum extent differed between regions. Around the notional year considered here, the island stood on the approach to that maximum: a cold, variable northern landscape rather than a timeless white desert. Sea level was much lower globally, exposing extensive continental-shelf landscapes, while ice and changing coastlines altered the practical connections between Ireland, Britain and mainland Europe.

It would be unsafe to draw a detailed map of the Doneraile district for one year. But the mammals from Castlepook and related southern Irish cave sites support an image of open, largely treeless country with patches of grassland, herb-rich ground, wet places and sparse shrub or tundra vegetation. Reindeer and mammoth point to landscapes able to sustain large grazers. Giant deer, brown bear, wolf, fox, mountain hare, lemmings and spotted hyaena reveal a more varied animal world than the later island fauna. Their presence does not mean that every species shared the same valley simultaneously, but it does show that Ireland could periodically support a substantial cold-stage fauna.

Predators were important agents in this environment as well as in the archaeological record. Spotted hyaena is known in Ireland most securely from Castlepook, and its bones indicate that the cave could serve as a carnivore den or refuge. Hyaenas compete, scavenge and transport bones; wolves do likewise in different ways. Their activity explains why the cave should not be imagined as a human home merely because humans may have touched one specimen in its collection. The cave was part of an ecological network in which carcasses, predators, weather and geology all left traces.

People at the North-Western Edge

If people were present, they were Upper Palaeolithic hunter-gatherers, living without agriculture, pottery, metal or permanent villages. Their economy would have depended on knowledge of animal movements, stone, shelter, fuel and seasonal conditions. Reindeer offered meat, marrow, hide, sinew, antler and bone, but Castlepook cannot show which resources were taken from the particular animal. It cannot establish whether hunting was communal, whether a kill was planned, or whether the people involved travelled with children, possessions or dogs.

Nor is there evidence from Ireland at this date for political affairs, diplomacy, formal leadership, war, religious observance, art, teaching traditions or exchange networks. Such things may have existed among Upper Palaeolithic groups elsewhere in Europe, but Ireland's record cannot responsibly fill these silences with borrowed stories. A visitor capable of using a sharp stone edge possessed learned skills, certainly; beyond that, claims about social organisation would be interpretation rather than evidence.

Comparison with north-west Europe gives only a broad context. Anatomically modern humans had long occupied parts of Europe by this stage of the Upper Palaeolithic, and mobile groups followed changing opportunities across its plains, coasts and river systems. Ireland lay at the far north-western edge of that wider world. Lower sea levels made the geography different from today, but did not guarantee an easy or permanent land route at every point: advancing ice, glacial lakes, rivers, exposed shelves and stormy coasts could all obstruct movement. The absence of a known Irish lithic industry is therefore as important as the marked femur.

What the Evidence Can Bear

The later fate of the landscape underlines the fragility of this possible human episode. As the last ice sheet grew, it covered Ireland and its continental shelf at maximum extent, eroding landscapes and helping to erase shallow archaeological sites. This helps explain why caves and isolated bones are disproportionately important. It does not, by itself, prove that a rich earlier archaeological record once existed; erosion is an explanation for loss, not a substitute for finds.

The contrast with the better-supported late Upper Palaeolithic evidence from Alice and Gwendoline Cave, County Clare, is instructive. There, a cut-marked brown-bear patella has two calibrated determinations of about 12,810–12,590 and 12,810–12,685 cal BP. That later evidence also indicates a

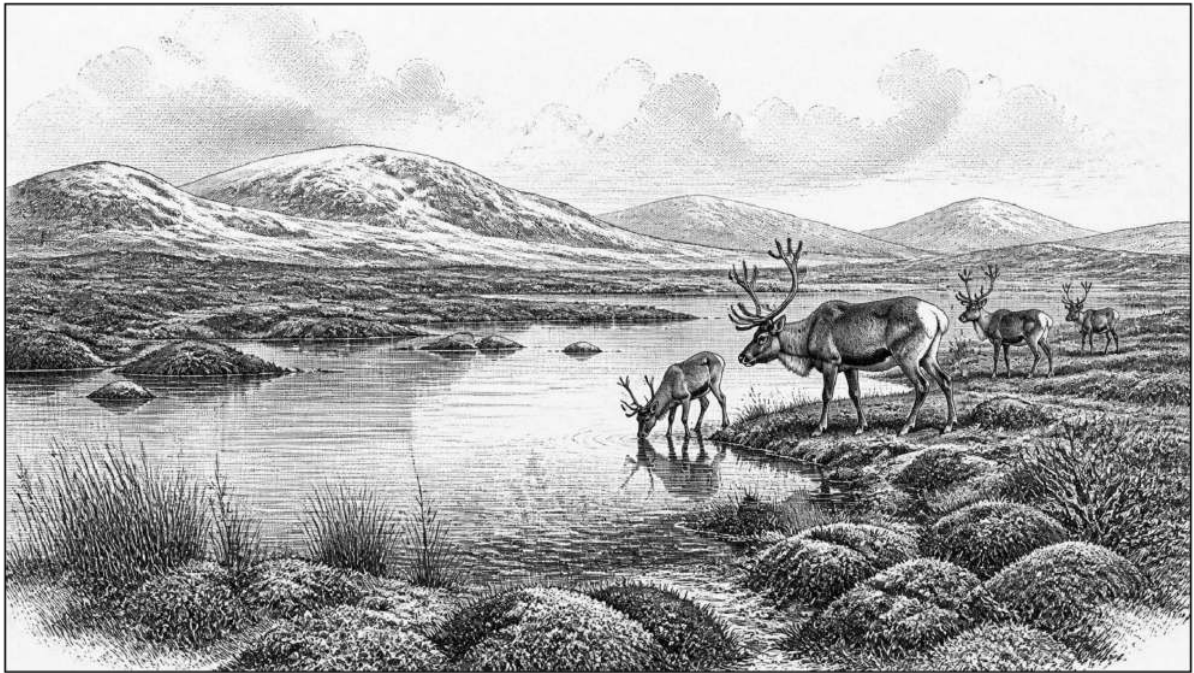
limited human presence rather than a fully documented settlement history. Castlepook's possible evidence is much older and, because it derives from an old and complex cave collection, needs even more caution.

Thus 31,658 BCE should not be presented as the year Ireland was settled, the year a named hunt occurred, or the beginning of an unbroken national story. It marks a scientifically important horizon around which Ireland's deepest human past may be reconsidered. The firm evidence is of a cold, open landscape inhabited at different times by reindeer and other Ice Age mammals. The most provocative evidence is a reindeer femur bearing a mark interpreted as stone-tool butchery. Between those statements lies the proper space for future excavation, dating and debate.

Chapter 044 of 100

31657 BCE

Maguirebridge's Trifoliate Pools^[44]



31,657 BCE is not a year that can be recovered from Ireland's archaeological record. It is a modern calendar label imposed on a period far beyond writing, named communities or annual chronology. Expressed in the usual radiocarbon convention, it lies roughly 33,600 calendar years before AD 1950, but that conversion is only approximate. At this depth in time, radiocarbon results require calibration and normally yield broad probability ranges, not dates precise enough to identify a season, a journey or a single generation. The responsible setting is therefore later Marine Isotope Stage 3, an unstable part of the last Ice Age, rather than an invented event in one Irish year.

An Interval Within the Ice Age

Ireland at this broad horizon was neither the familiar green island of later prehistory nor simply a featureless sheet of ice. It lay in a North Atlantic world marked by sharp climatic shifts, changing glaciers, exposed ground and great differences between local environments. The Last Glacial Maximum—the phase when the British–Irish Ice Sheet was at or near its greatest later extent—still lay ahead. Yet glacial growth and ice-margin fluctuations had already profoundly altered the country, while later ice would scour, bury and rearrange much of the evidence now sought by archaeologists.

That destructive history explains the extraordinary sparseness of the record. There are no securely dated houses, hearths, stone-tool scatters, graves, food stores or occupation surfaces from Ireland that can be assigned to around 31,657 BCE. Nor can a map of one locality be extended uncritically to the whole island. Ice, water, vegetation and animal movements varied from district to district; the present coastline was also irrelevant to a period of lower sea level and changing ice-loaded landscapes. What survives comes chiefly from exceptional sediment deposits and cave bone collections. These are windows, not a complete national archive.

Freshwater Beneath a Drumlin

The most valuable Irish environmental evidence near this notional date comes from Derryvree townland, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two separate layers of till, the unsorted sediment left by glacier ice. The sequence has an unusually clear relative order: an earlier glacier laid down the lower till; a non-glacial interval allowed waterborne sediment and organic material to accumulate; then a later advance buried the deposits beneath fresh till.

Organic material from the Derryvree series produced a conventional radiocarbon age of about 30,500 $\pm$ 1,170 radiocarbon years BP. Using modern calibration, discussion of that determination places the deposits broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The date label considered here falls within that wide interval, but it cannot be located within a particular bed or treated as the moment at which the pool existed. The evidence demonstrates an ice-free freshwater and periglacial environment in this part of Fermanagh during later MIS 3; it does not show that all Ireland was ice-free at the same time.

The Derryvree biological remains make the landscape more tangible. Pollen, plant macrofossils, mosses and insects indicate open tundra or muskeg: wet, largely treeless ground, with pools and plant-rich margins. Grasses, sedges, herbs and low shrubs were important, alongside mosses. Finds including bogbean (*Menyanthes trifoliata*), alternate water-milfoil and mountain avens point to freshwater or damp habitats embedded in a cold open country. These remains do not permit a picturesque reconstruction of every hillside, but they decisively rule out mature temperate woodland. Winters were harsh, growing seasons short, and frost likely shaped soils, drainage and the availability of plant cover.

A Patchwork, Not a White Void

Open ground should not be confused with lifeless ground. Summer light could support grasses, flowering herbs, moss beds and wetland plants; pools and watercourses created sheltered, productive niches. The most realistic image is a patchwork of stony or frost-disturbed terrain, sedgy water margins, low vegetation and locally variable shelter, not an unbroken snowfield. Equally, it was not a stable landscape. North Atlantic climate during MIS 3 could change abruptly on millennial and shorter scales, affecting the reach of ice, river flow, snow cover and the distribution of animals.

Evidence from western Irish marine sequences reinforces the need for caution. It suggests that the Irish Ice Sheet was active and capable of substantial expansion before the later maximum, while other studies show that its margins did not behave as one fixed island-wide line. Fermanagh's buried freshwater deposits and southern or western coastal records therefore belong in a regional history of advance, retreat and reorganisation. Derryvree preserves an interval when its locality supported open wetland; it should not be used to claim either a wholly ice-free Ireland or a uniform climate from Cork to Donegal.

Animals and Cave Deposits

Castlepook Cave, near Doneraile in north County Cork, supplies the principal faunal counterpoint to Fermanagh's plants and sediments. Antiquarian excavations there, often calling the site Mammoth Cave, produced a remarkable collection of Late Pleistocene bones. Modern reappraisal and radiocarbon work have shown that several species were present in southern Ireland during MIS 3, although the old

excavations disturbed deposits and often left poor contextual records. The cave material must therefore be read as evidence for animals in the wider landscape, not as a neatly dated assemblage from one occupation episode.

The documented fauna includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. This is a striking community of large herbivores, smaller cold-adapted mammals and formidable carnivores, but it was not necessarily a single group living together at one moment. Direct re-dating has in fact made some Castlepook specimens substantially older than earlier measurements suggested. Research indicates that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 calibrated years BP. Individual dates and species ranges matter more than any simple ‘Ice Age animal list’.

Reindeer are particularly evocative because their presence fits an open, cold landscape in which mobile grazers could exploit seasonal vegetation. But caves were also places where carnivores dragged and consumed carcasses. A bone recovered there may record predation, scavenging, denning, water movement or nineteenth- and early twentieth-century excavation practices, rather than a human hunt. The hyaena skull held by the National Museum of Ireland is a useful reminder that these animals were once part of the Irish fossil record, despite their modern African association.

The Unsettled Human Question

A reindeer femur from Castlepook has been reported as bearing a deep mark consistent with fresh-bone cutting or chopping by a stone implement, and the specimen has been publicised as around 33,000 years old. If specialist assessment ultimately confirms that the mark is anthropogenic and contemporary with the animal’s death, it would be important evidence that Upper Palaeolithic people reached Ireland far earlier than the formerly accepted record. It would not, however, demonstrate a permanent settlement, a village or continuous occupation. One modified bone could reflect a short visit by a very small party processing a carcass.

That qualification is essential. Natural abrasion, carnivore damage, excavation damage and later handling can sometimes resemble human modification. Castlepook’s historic collection also lacks the undisturbed stratigraphic context that would link a bone securely to a living floor, hearth or tool assemblage. Current excavation and reassessment are valuable precisely because they test such claims rather than merely repeating them. The National Museum of Ireland still describes unequivocal Palaeolithic human presence on the island as unproven. The stronger published evidence for a human visit belongs much later: a cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, directly dated to about 12,810–12,590 cal BP.

No Politics to Recover

For this reason, political affairs, diplomacy and organised conflict cannot responsibly be narrated for Ireland around 31,657 BCE. There are no rulers, peoples, territories, languages or institutions identifiable in the evidence. Nor are there grounds for claims about formal religion, ritual, learning, trade networks, farming or domestic livestock. Those subjects become historically meaningful only much later, when settlements, artefacts, burials and eventually written records permit social relationships to be traced.

If people did visit the island during this phase, comparison with Upper Palaeolithic societies elsewhere in north-west Europe suggests that mobility, knowledge of terrain, access to animal food, shelter and fuel would have mattered greatly. That is an informed archaeological analogy, not direct Irish

evidence. No Irish object from this horizon establishes what tools were carried, what language was spoken, whether groups crossed by land or water, or how often they returned. The most defensible conclusion is smaller but still important: the island's cold-stage environments could support animals, and they may have been accessible to people on rare occasions.

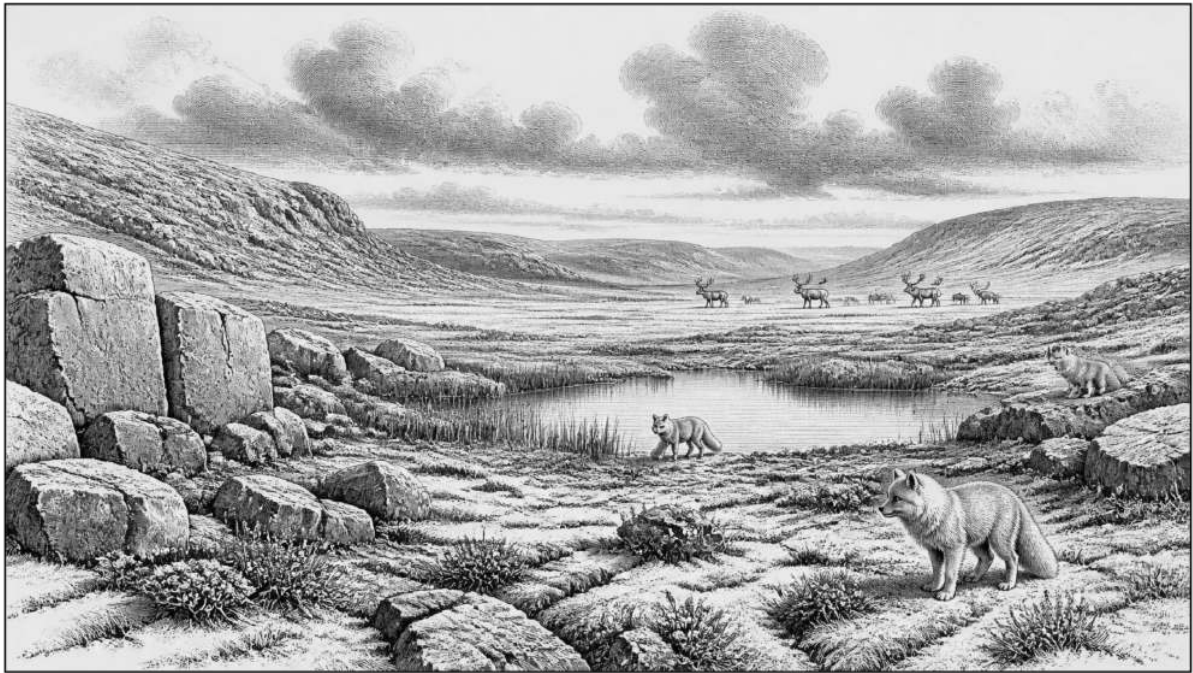
What the Record Can Say

Thus the significance of this nominal year lies not in an anniversary but in the survival of fragile archives. Derryvree's silts preserve a cold freshwater tundra landscape sealed between glacial episodes. Castlepook's bones show that large mammals and carnivores used parts of Ireland during the broader MIS 3 period, while also warning how carefully old collections must be interpreted. Together they reveal an Irish landscape undergoing profound environmental change: locally habitable for specialised plants and animals, increasingly vulnerable to renewed ice, and almost silent about human lives. That silence is evidence in itself, setting the limits within which Ireland's earliest history must be written.

Chapter 045 of 100

31656 BCE

Castlepook's Waning Fauna^[45]



The label 31,656 BCE gives an appealingly exact appearance to a time that cannot be dated with modern calendar-year precision. No Irish document, settlement layer or event belongs to this particular year. It is a backwards projection of a modern calendar, useful only as a point on a very long timeline. In scientific terms it corresponds approximately to 33,600 calibrated years before present (cal BP, where “present” is 1950), within the Late Pleistocene and Marine Isotope Stage 3. Even that conversion should not be mistaken for an anniversary: radiocarbon determinations have error ranges, calibration produces ranges rather than single dates, and the surviving Irish evidence represents intervals rather than moments.

What can responsibly be said is that Ireland stood near a decisive environmental threshold. The island lay in the later part of a fluctuating Ice Age, before the fullest development of the Last Glacial Maximum. The British–Irish Ice Sheet was not a fixed white blanket appearing everywhere at once. It grew and retreated unevenly across different regions and sectors; the most extensive later glaciation belongs broadly to the period after about 31,000 years ago, with maximum positions reached at different times between roughly 30,000 and 22,000 years ago. Around the nominal date, therefore, Ireland was entering a worsening climatic phase, but the precise distribution of ice, open ground, sea and vegetation cannot be reconstructed year by year.

A Landscape in Transition

The familiar image of Ireland as a green, wooded island is wholly inappropriate. During cold phases of the Late Pleistocene, woodland could not have formed a continuous cover. Periglacial conditions – severe seasonal freezing, frost-shattered ground, sparse vegetation and unstable drainage – shaped much of the land that was not buried beneath ice. Streams carried fine sediment; exposed soils could be

disturbed by frost and wind; and shallow pools or wet hollows offered sharply local habitats. The coastlines too were unlike those of the present. Global sea level was substantially lower because enormous quantities of water were held in ice sheets, exposing parts of the continental shelf. Yet lowered sea level does not itself demonstrate a simple, enduring walkable bridge between Ireland and Britain at every stage. The changing Irish Sea basin, ice margins and channels make routes of movement a subject for reconstruction rather than certainty.

The best Irish environmental archives near this broad timespan are neither houses nor artefacts but deposits sealed beneath later glacial sediments. At Derryvree near Maguiresbridge in County Fermanagh, road works revealed fine freshwater silts and sands between two distinct till sheets within a drumlin. The sequence proves that freshwater and vegetation occupied the locality between episodes of glaciation. Its conventional radiocarbon date, approximately 30,500 radiocarbon years BP with a large uncertainty, calibrates to a broad later-Pleistocene range rather than a single calendar point. Derryvree is therefore relevant to the world of 31,656 BCE, not proof of conditions in that exact year.

Plant macrofossils, pollen, mosses and insects from Derryvree indicate open, cold ground with freshwater margins: a tundra or muskeg-like landscape rather than mature forest. Sedges, mosses, bogbean and other wet-ground plants could grow around pools and saturated hollows, while the wider terrain supported herb-dominated vegetation. Small amounts of tree pollen do not overturn that interpretation, since pollen can travel considerable distances. The value of this evidence lies in its specificity about a local wetland and its wider indication of a treeless, periglacial setting; it does not license a detailed map of all Ireland's plants or rainfall in 31,656 BCE.

Castlepook and the Animal Record

County Cork provides a complementary but equally cautious record. The limestone caves at Castlepook, near Doneraile in the Awbeg valley, have yielded Ireland's most important assemblage of Middle to Late Pleistocene animal remains. Among the animals identified from the cave deposits are woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These finds establish a major point about Ireland's place in Ice-Age Europe: at favourable times, cold-adapted mammals reached this north-western edge of the continent and formed part of wider ecological networks.

The cave collection must not, however, be turned into a single imaginary procession of animals in one valley on one day. Many bones were excavated in the early twentieth century, before modern standards of stratigraphic recovery and recording. Cave sediments can be disturbed, material can be redeposited, and fossils from different episodes may be mixed. Improved radiocarbon pretreatment and re-dating have shown that some older determinations from Castlepook and nearby caves were too young. Current scholarship places important elements of the Castlepook fauna within Marine Isotope Stage 3, while also suggesting that giant deer and spotted hyaena may have disappeared locally before the later Last Glacial Maximum, perhaps around 40,000 cal BP. That is why the evidence is best read as a changing faunal history, not a checklist for 31,656 BCE.

Nevertheless, the record gives a vivid sense of the ecological pressures at work. Reindeer and lemmings point towards cold, open habitats. Mammoth and giant deer imply that, during their respective occupations, enough grazing and browsing resources existed to support very large herbivores. Wolves and hyaenas belonged to a predatory and scavenging guild dependent on such prey. Their presence makes clear that Ireland was not biologically empty throughout the Pleistocene. Yet populations at the Atlantic

margin were likely vulnerable to rapid climatic shifts, shrinking suitable habitat and the advancing ice sheet. Local extinction, recolonisation and genetic turnover are more defensible themes than permanent, stable occupation by any species.

Connection Without a Known Route

How did these animals arrive? The honest answer is that no single route has been demonstrated for every species and every phase. Low sea levels, changing exposed shelf landscapes and ice-associated corridors altered the geography of access. Recent sedimentary ancient-DNA research from Castlepook has recovered traces of several ancient taxa and suggests genetic links between Irish cave hyaenas and mammoths and wider Eurasian populations. This is promising evidence for faunal connectivity before the Last Glacial Maximum, but it is presently a preprint rather than a final peer-reviewed conclusion. It strengthens the case for Ireland's participation in a broader north-west European animal world; it does not settle whether a particular herd crossed dry ground, ice, narrow water or a sequence of changing routes.

There is no basis for describing trade, exchange or diplomacy in the human sense. Mammals moved through ecological opportunity, not political frontiers. Nor can one infer a settled human community from the presence of large game. The food resources that attracted predators might also have been attractive to people in other parts of Upper Palaeolithic Europe, but suitability is not evidence of occupation. Ireland's subsequent glaciation has undoubtedly destroyed, buried or reworked older landscapes, so absence of evidence cannot prove that no person ever visited during the wider period. It does mean that archaeology cannot demonstrate a resident population here in this year.

No Demonstrated Human Society

This limitation matters especially when discussing everyday life. Ireland has no securely dated hearth, house, burial, tool-making floor, lithic assemblage or human remains attributable to around 33,600 cal BP. A reindeer femur from Castlepook has been publicised as bearing possible human modification and as potentially very early evidence of human activity. The observation is important and deserves continued investigation, but a single bone from a historically excavated cave cannot support a full social narrative. It does not identify the maker, establish a camp, reveal a language or prove continuous settlement. The National Museum of Ireland accordingly still presents the Palaeolithic human record as lacking clear evidence of human presence.

Political affairs, warfare, diplomacy, named leaders and institutions are therefore absent not because people of this era elsewhere lacked social relationships, but because no Irish evidence allows them to be recovered. The same restraint applies to religion and learning. There are no Irish ritual sites, portable artworks, inscriptions or teaching traditions that can be assigned to this date. It would be misleading to fill the gap with later Gaelic mythology, Celtic imagery or assumptions borrowed wholesale from continental cave art. Those belong to different bodies of evidence and, in some cases, vastly later periods.

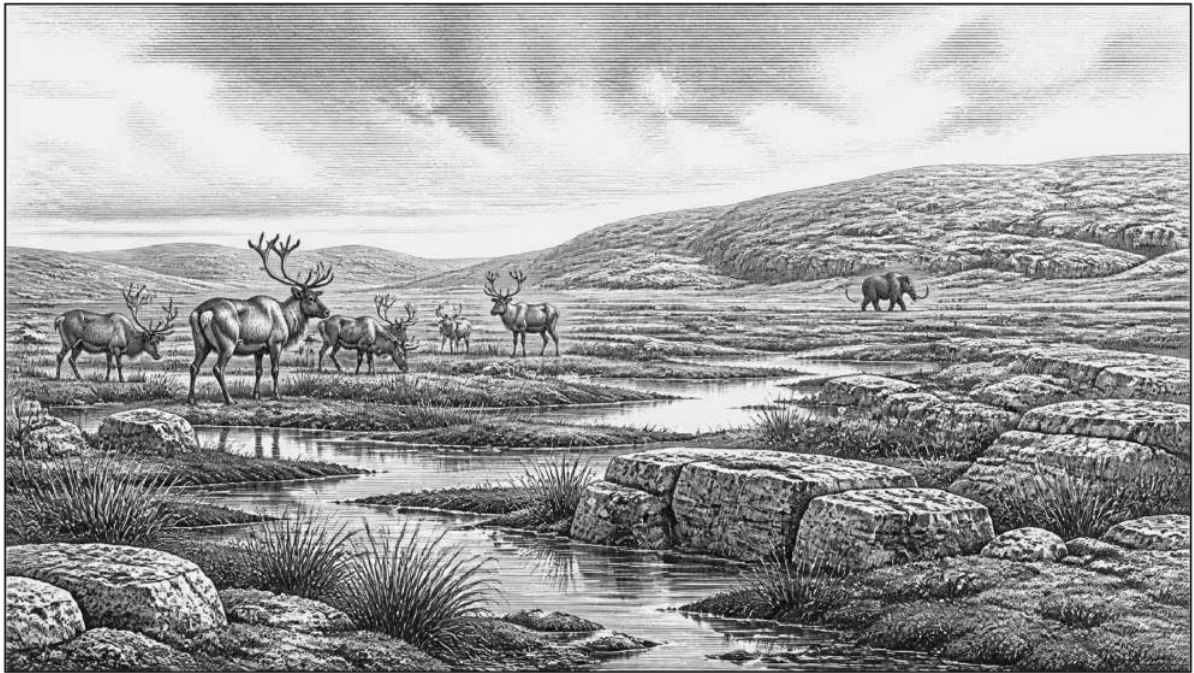
If people did make brief visits to Ireland somewhere within this broad Ice-Age interval, their lives would have required expert knowledge of cold weather, animal behaviour, shelter, fire and movement across a hazardous landscape. That is a general inference from Upper Palaeolithic societies elsewhere in Europe, not a demonstrated Irish fact. For Ireland itself, the responsible story is more elemental: freshwater beds beneath Fermanagh drumlins record a cold open environment; Cork caves preserve

evidence of shifting animal communities; and ice-sheet research shows that climatic deterioration was gathering force. Around the modern label 31,656 BCE, the principal historical development was environmental change, setting limits on every possible future human and animal occupation of the island.

Chapter 046 of 100

31655 BCE

Doneraile's Reindeer Horizon^[46]



The label “31,655 BCE” is a modern chronological convenience, not a year that people in prehistoric Ireland could have named or counted. At this depth of time, archaeology cannot isolate a political event, a journey or a human life within a single calendar year. The number corresponds approximately to 33,600 years before AD 1950, but radiocarbon results must be calibrated and are normally meaningful only as broad ranges of centuries or millennia. Ireland at this notional point lay in the Late Pleistocene, within Marine Isotope Stage 3: an unstable phase of the last Ice Age, long before the climatic extreme known as the Last Glacial Maximum.

The responsible history of Ireland at this date is therefore not a story of rulers, borders or recorded communities. It is a story reconstructed from cave bones, buried wetland sediments, pollen, insects, glacial deposits and the careful re-dating of old museum collections. These sources show that parts of Ireland could sustain cold-adapted animals during portions of this era. They do not establish a permanent human population, a village or an Irish society in any ethnic, linguistic or political sense.

A Landscape Before Maximum Ice

About 31,655 BCE, the great British–Irish Ice Sheet had not yet reached its better-documented later maximum. Research on its earlier growth increasingly indicates advance, retreat and regional variation during Marine Isotope Stage 3. That makes sweeping statements that all Ireland was continuously buried beneath ice misleading. Some ground was glaciated; elsewhere, or at other times, exposed terrain, coastal margins and river valleys may have remained available to plants and animals. The precise outline of ice at any one moment remains uncertain, especially because later ice repeatedly eroded or concealed earlier landscapes.

The major expansion associated with the Last Glacial Maximum came later, broadly after 30,000 years ago and most extensively around 26,000–20,000 years ago. Thus 31,655 BCE belongs to a world moving towards more severe conditions, rather than to the point of maximum ice coverage. The island's physical geography also differed from today's. Sea level was lower than now, though changing ice load, land movement and marine conditions make it unsafe to draw a simple, certain land bridge across the Irish Sea for this particular date. Animal movements demonstrate connectivity of some kind between Ireland, Britain and continental Europe over long periods; they do not by themselves reveal the exact route, season or frequency of passage.

Castlepook's Mixed Cave Archive

The most important Irish site for this period is Castlepook Cave near Doneraile in north County Cork, above the Awbeg Valley. Its limestone passages, including galleries historically called Hyenahall and Elephant Hall, yielded a remarkable collection during excavations from the late nineteenth century into the early twentieth. Geological Survey Ireland describes Castlepook as Ireland's richest site for vertebrate evidence in the long interval leading to the Last Glacial Maximum. Individual bones have produced dates spanning roughly 45,700 to 19,950 years before present, demonstrating that the cave archive represents repeated episodes across many millennia rather than one frozen instant.

This is a crucial caution. A cave is not automatically a home. It can be a carnivore den, a natural trap, a shelter, a drainage route and a repository into which water moves bones from outside. At Castlepook, flowing water disturbed and mixed material; early excavators also removed much sediment before modern recording methods existed. Consequently, bones from mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena are powerful evidence that these animals reached Ireland in different parts of the Late Pleistocene, but not all necessarily evidence that they occupied the cave together.

The spotted hyaena is especially revealing. Its presence shows that Ireland's fauna included a large scavenging predator now absent from Europe. Hyaenas can accumulate bones in dens, gnawing, carrying and rearranging carcass parts. This makes Castlepook both richer and harder to interpret: a concentration of bones may reflect predation and scavenging as much as a living landscape outside the entrance. Woolly mammoth and reindeer point to an open, cold environment capable of supporting large herbivores, while bears, foxes and wolves indicate a more complex food web. Yet species lists cannot furnish an exact census of the Awbeg Valley in 31,655 BCE.

Open Ground and Wet Places

Evidence from north-western Ireland complements the Cork caves. At Derryvree near Maguiresbridge, County Fermanagh, roadworks exposed organic silts and fine sands sealed between tills left by separate ice advances. A radiocarbon determination from the intervening deposits has been calibrated broadly to about 36,900–31,700 calendar years before present, approximately 34,950–29,750 BCE. The range embraces 31,655 BCE, but it must not be converted into an event date. It records an environmental interval, not a day, generation or named occupation.

Pollen, mosses, plant remains and insects from the Derryvree sequence indicate cold, open and treeless conditions, often described as tundra or muskeg. This was not the familiar green, wooded Ireland of later prehistory. Low vegetation, sedges, mosses and wet ground around shallow water probably formed a patchwork with exposed mineral soils and periglacial surfaces. Such places could provide

seasonal forage and freshwater, but would also have been vulnerable to frost, wind and abrupt climatic change. The survival of these deposits beneath later ice is fortunate: most surfaces on which people or animals moved were destroyed, reworked or remain hidden.

It follows that the Ireland of this period should not be imagined either as an unbroken white ice cap or as a fertile grassland. It was a variable northern landscape whose habitable patches expanded or contracted with climate and ice margins. The available record is strongest for environments and animals, weaker for the timing of their movements, and weakest of all for human presence.

The Reindeer Bone Question

A reindeer femur from Castlepook has made this period newly important to Irish archaeology. Public reporting and County Cork heritage material identify a deep mark on the bone as consistent with cutting or chopping by a sharp stone implement, and report a date of about 33,000 years ago. If specialist study ultimately confirms that interpretation, it would be extraordinarily early evidence that Upper Palaeolithic people handled a reindeer in Ireland, perhaps during butchery. It would move possible human activity on the island far earlier than the long-established late-glacial evidence from County Clare.

That finding is promising, but it is not a licence for certainty. The bone comes from an old cave collection rather than a modern excavation of an intact occupation surface. A radiocarbon date measures the animal's death, not necessarily the exact time, place or agent of the modification. Identifying a mark on bone requires taphonomic assessment: carnivore damage, sediment abrasion, breakage and later handling must be distinguished from cuts made on fresh bone. Nor has a securely associated hearth, stone-tool assemblage, dwelling, burial, food-preparation area or repeated occupation layer of comparable age been published from Castlepook.

The most defensible conclusion is therefore deliberately limited. Around this broad phase of Marine Isotope Stage 3, Ireland may have received brief visits from hunter-gatherers able to exploit large game. The Castlepook reindeer bone is possible evidence for one such encounter, not proof of continuous settlement. It cannot tell us whether people crossed from Britain, travelled over an exposed northern route, used watercraft, stayed for hours or seasons, or returned in later years. Nor can it identify a language, ancestry, social group or cultural tradition.

Life, Society and Absence

If people did reach the island, their immediate concerns would have been shelter, fire, clothing, stone tools, food and safe movement through a cold terrain shared with large predators. Comparisons with Upper Palaeolithic groups elsewhere in north-west Europe make those practical needs plausible, particularly where reindeer formed part of mobile hunting economies. But comparison is context, not direct Irish evidence. No Irish artefact assemblage of this age securely demonstrates spear technology, hide-working, camp layout, clothing, art or seasonal organisation.

There is no evidence from Ireland around 31,655 BCE for agriculture, livestock, permanent houses, pottery, metalworking, monuments or long-distance trade in the later prehistoric sense. Equally, there is no basis for naming chiefs, tribes, wars, alliances, diplomacy, law or ritual institutions. Religion and learning leave no identifiable Irish trace for this date: no graves, carvings, paintings, structured deposits or ceremonial places can safely be assigned to it. The absence is not evidence that people lacked thought, culture or belief; it is evidence that the Irish archaeological record has not preserved material by which those subjects can responsibly be described.

Political history, in the conventional sense, begins much later. Here the decisive forces were climate, ice, sea and ecology. A reindeer herd shifting across open ground, a hyaena using a limestone den, or a small party of hunters processing a carcass would have mattered more to survival than any imagined frontier. The cave collections and buried Fermanagh wetlands offer rare windows into that world, but they are windows with cracked glass.

What Can Be Said Securely

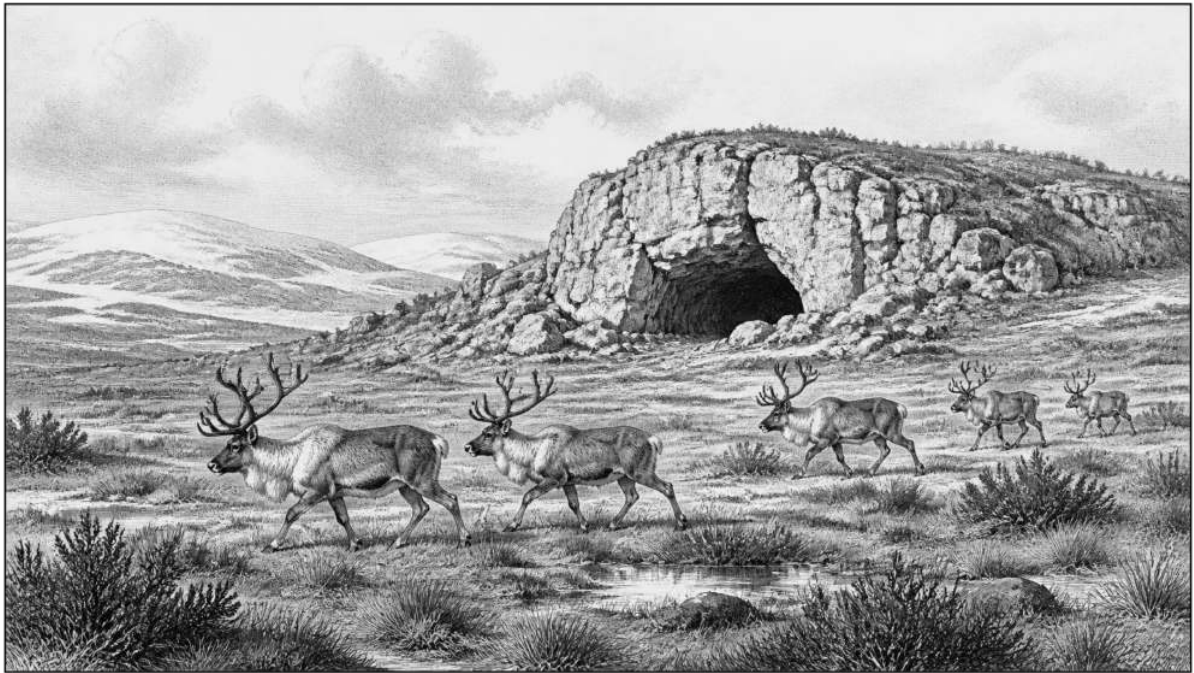
For 31,655 BCE, the secure historical picture is one of Late Pleistocene Ireland before the final great ice expansion: environmentally harsh, regionally varied and intermittently capable of supporting a cold-stage fauna. Castlepook Cave confirms the importance of north Cork as an archive of mammoth-steppe and tundra-associated animals across a long span. Derrynree confirms that cold, treeless wetlands existed during a broad interval that includes this notional year. The possibility of human activity at Castlepook deserves serious investigation because it rests on a potentially modified, directly dated animal bone.

But precision must stop there. Modern calendar-year accuracy is unavailable; the evidence supports calibrated ranges, not an annual chronicle. Ireland may have been visited, but it cannot yet be shown to have been permanently inhabited. The most important development was not a recorded human event but the formation of an Ice Age landscape whose few surviving deposits still determine what can be known about the island's deepest past.

Chapter 047 of 100

31654 BCE

Mammoth Cave's Cold Menagerie^[47]



The label 31,654 BCE cannot identify an event in Ireland to a single modern calendar year. No written chronology existed, and archaeological dating at this depth of time works through probability ranges rather than anniversaries. In modern conversion, the label falls at roughly 33,600 years before present, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. The responsible task is therefore not to invent a happening for that year, but to ask what the surviving environmental, faunal and archaeological evidence can say about Ireland during the surrounding millennia.

A Date Within Ranges, Not a Dated Year

Radiocarbon determinations are reported in radiocarbon years and then calibrated against independently established curves to produce calendar-age ranges. Both the scientific measurement and the conversion have uncertainties. A calendar label such as 31,654 BCE is consequently much more precise-looking than the evidence permits. It should be treated as a point within a broad chronological neighbourhood, not as a moment at which conditions across the island can be reconstructed exactly.

Two important buried deposits in County Fermanagh demonstrate both the value and the limits of the evidence. Organic material from lake deposits beneath till at Greenagho produced an age calibrated to about 37,200–35,700 calendar years before present. Organic-rich silts between tills at Derryvree produced a wider calibrated range of about 36,900–31,700 calendar years before present. These are not annual records, and they do not prove that every part of Ireland was simultaneously ice-free or inhabited. They do show that, during intervals encompassing the date in question, north-central Ireland contained environments capable of preserving freshwater sediments, plants and small animal remains before later glacier ice overran and sealed them.

The date also belongs to the long and uneven build-up towards the Last Glacial Maximum, rather than to the maximum itself. The fullest expansion of the last British–Irish Ice Sheet came later, broadly in the period after about 27,000 years ago and with different sectors advancing at different times. Ice-sheet growth was not a simple, island-wide march from mild conditions to an unbroken frozen cover. Climate fluctuated sharply; uplands and northern areas could have supported expanding ice while other districts retained exposed ground, wetlands, rivers, caves and animal habitat. Reconstructions remain actively debated because the later ice sheet eroded or buried much of the earlier evidence.

Open Ground and Freshwater Basins

The Fermanagh deposits offer the closest environmental window. Their fossils include plants suited to cold, open and wet ground: sedges and other herbs, aquatic plants, mosses and dwarf shrubs. Such assemblages are evidence for local habitats, not a complete botanical map of the island. Yet they make a densely forested Ireland implausible. The landscape around suitable basins was likely a patchwork of shallow water, marsh, damp mineral soil and exposed, frost-affected terrain, with vegetation low enough to leave much ground open to wind and seasonal cold.

That does not mean that Ireland was uniformly barren. MIS 3 contained recurrent climatic shifts, and vegetation could respond rapidly where moisture, shelter and soil allowed. The plant evidence is best read as a record of cold-stage ecological mosaics, in which wet hollows and water margins sustained more life than an image of a featureless ice desert suggests. Small-scale variation mattered: a sheltered limestone valley, a spring-fed pool or a river terrace could offer forage and cover very different from nearby slopes.

Sea level was lower than today because vast quantities of water were locked in northern ice sheets. Ireland's coastline and the surrounding shelf were therefore unlike the familiar modern outline, while the Irish Sea region formed a changing geographical threshold rather than a fixed boundary. The presence of terrestrial mammals in Ireland establishes that populations reached the island during favourable phases, but the precise routes and timing of every crossing cannot be recovered. It is safer to speak of shifting opportunities for dispersal than of a confidently mapped land bridge at this particular date.

Castlepook's Faunal Evidence

The richest Irish evidence for this broad phase comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations begun in the early twentieth century recovered an extraordinary Pleistocene bone assemblage. Its recorded animals include woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The National Museum of Ireland identifies Castlepook as the country's most important site for mammal remains from the last cold stage.

This is not a photograph of one day in 31,654 BCE. Cave deposits accumulated through repeated episodes and were disturbed by carnivores, water, excavation and later interpretation. Direct radiocarbon work has shown that parts of the southern Irish fauna belong to MIS 3, while also revising older assumptions based simply on animal species. A mammoth bone or hyaena skull proves that the animal, or its remains, entered a particular depositional history; it does not automatically prove that all the listed animals grazed or hunted together in one season.

Nevertheless, the assemblage establishes the ecological possibilities of late Pleistocene Ireland. Reindeer point to open forage country. Mammoths and giant deer indicate that large herbivores could use at least some landscapes. Carnivores, especially spotted hyaena, matter because caves may have been

dens, scavenging places or traps in the movement of bones. Hyaenas could carry carcass parts into shelter and gnaw them; bears could occupy caves; water could redeposit material. Archaeologists must disentangle these processes before assigning any bone to people.

A Possible Human Trace

One Castlepook reindeer femur has changed the terms of discussion. Zooarchaeologist Dr Ruth Carden identified a deep incision on the bone as consistent with a sharp stone tool used in carcass processing. Public presentation of the find described it as evidence of human activity in Ireland around 33,000 years ago. If that interpretation is sustained by further microscopic study, securely stratified finds and comparable material, it would push the known Irish human story far earlier than the previously accepted terminal-Pleistocene evidence from County Clare.

It must, however, remain a carefully qualified possibility rather than the foundation for an invented settlement. The bone's date is the date of the animal, within a measured range; the inference that its mark was made by a human is a separate taphonomic judgement. A single modified bone would show an encounter with a carcass, perhaps a brief hunting or scavenging visit. It would not demonstrate a permanent population, a camp, a family group, a tool-making workshop or a continuous Irish Palaeolithic tradition. No associated hearth, stone-tool assemblage, dwelling floor or human remains have yet supplied that larger context.

Any visitors would have belonged broadly to the Upper Palaeolithic hunter-gatherer world of north-west Europe. That comparison allows restrained generalisation: people elsewhere used portable stone tools, practised skilled carcass processing and moved through seasonal landscapes in small, flexible groups. It cannot fill Ireland with particular tents, clothing, languages, kin groups or rituals. Such details are culturally plausible in a continental sense but unsupported in the Irish record for this period.

Life Beyond the Reach of Certainty

There is no evidence from Ireland at this date for political institutions, named leaders, territories, diplomacy, warfare, farming, livestock, formal trade routes, monuments or organised religion. These are not merely gaps in a written record: the material traces needed to infer them are absent. The most defensible economic picture is ecological rather than political. Animals moved through a cold landscape; carnivores and scavengers competed for carcasses; and, if people were present, food, hides, marrow and bone were potentially valuable resources obtained through hunting, scavenging or both.

Likewise, no Irish evidence can identify religious practice, art, teaching or language around this point. Caves should not be assumed to have been sanctuaries simply because cave art is known in parts of Ice Age France and Spain. Castlepook's importance lies instead in its faunal archive: bones, tooth marks, sediment histories and the possibility of a humanly altered specimen. Learning in the modern sense cannot be documented, although any mobile foragers who reached Ireland would necessarily have depended on transmitted environmental knowledge—of animals, weather, routes and workable stone.

Settlement, if it occurred, was probably intermittent and vulnerable to climatic change. A small visiting party could leave almost nothing that survived later erosion, glaciation and rising sea level. Conversely, absence of evidence is not proof that no one ever arrived. The appropriate conclusion is narrower: permanent occupation has not been demonstrated, whereas a possible human episode at Castlepook deserves further testing.

Approaching a Glacial Future

The greatest development relevant to Ireland around 31,654 BCE was environmental change. In the following millennia the growing Irish sector of the British–Irish Ice Sheet transformed landscapes, scoured older surfaces and reduced the preservation of earlier human traces. By the Last Glacial Maximum, much of Ireland was ice-covered or subject to severe periglacial conditions. The sheltered Fermanagh sediments and the Cork caves are precious partly because they survived this destructive history.

For this notional year, then, Ireland was neither a land of known communities nor simply a blank beneath ice. It was a changing northern environment in which freshwater basins preserved cold-adapted vegetation, large mammals ranged during suitable phases, and a cave near Doneraile accumulated the remains of an Ice Age food web. One marked reindeer bone may eventually add people to that scene. Until corroborating evidence arrives, it should be understood as a provocative clue, not a calendar-year certainty.

Chapter 048 of 100

31653 BCE

Derryvree Before the Drumlin^[48]



31,653 BCE is a modern calendar label, not a year that anyone in Pleistocene Ireland could have named or counted. It corresponds approximately to 33,602 years before the conventional radiocarbon baseline of 1950, but archaeology cannot resolve an event, a season or a human life within that single notional year. At this depth of time, the responsible frame is the later part of the Late Pleistocene, within Marine Isotope Stage 3, and the evidence comes in broad, calibrated ranges rather than calendar dates. Radiocarbon results must be calibrated because atmospheric carbon-14 has varied through time; even then, their uncertainties are usually measured in centuries or millennia. Ireland at this horizon is therefore best understood as a changing Ice Age landscape, not as a polity with a recoverable annual history.

An Ice Age Interval, Not the Ice Maximum

This was not yet the Last Glacial Maximum, the period when ice later covered the whole island and much of its continental shelf, conventionally dated in Ireland to roughly 27,000–23,000 calibrated years before present. The broad build-up to that maximum was nevertheless under way. Reconstructions of the British–Irish Ice Sheet place the onset of substantial expansion after about 35,000–32,000 years ago, but they also stress that ice advanced unevenly, with local upland glaciers, ice caps and ice-sheet sectors responding differently. At roughly 33,600 years before present, Ireland was not simply either ‘ice-covered’ or ‘ice-free’. It was a region of severe climatic instability in which open ground, seasonal snow, frozen soils, freshwater basins and growing upland ice could coexist across different districts.

The later maximum would radically alter both terrain and evidence. Moving ice eroded bedrock, reworked sediments and removed or buried many older surfaces. That is one reason why the archaeological record for this period is so sparse: absence of camps, tools or burials cannot by itself

demonstrate that people never visited. It may instead reflect a destructive glacial history, difficult cave deposits and the limited survival of buried landscapes on land and beneath the sea. Modern reconstructions are powerful but remain models constrained by landforms, sediments and dates; their mapped ice margins are not exact photographs of a single year.

Derryvree's Buried Freshwater World

The clearest Irish environmental archive relevant to this date lies at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed organic freshwater silts and fine sands trapped between two thick sheets of till. The lower and upper tills record glacial episodes; the intervening deposits preserve a period when ice was absent locally and a wetland or shallow-water environment supported living communities of plants and animals. A conventional radiocarbon measurement from the deposit, Birm-166, gave 30,500 radiocarbon years before present, with a substantial error margin. Later calibration places the material broadly around 36,900–31,700 calibrated years before present. That range includes 31,653 BCE, but does not identify that exact year.

What can be said is striking enough. The Derryvree plant and animal evidence indicates open tundra vegetation and a periglacial climate: ground subject to intense cold, freezing and thawing, rather than a wooded Irish countryside. Fossil insects and plant remains have been interpreted as evidence for a moss-rich wetland, open pools and abundant decaying vegetation. The wider scene was probably treeless or nearly so, with low herbaceous plants and shrubs adapted to short growing seasons. This was not an empty white wilderness. Freshwater margins could be biologically productive in summer, while the long winters remained severe. Derryvree gives a local window rather than an island-wide map, but it demonstrates that north-central Ireland could sustain active terrestrial and wetland ecosystems during a cold interval before the major advance of the last ice sheet.

Water, Caves and Changing Ground

Other Irish evidence supports the picture of fluctuation rather than permanence. At Crag Cave in County Kerry, uranium-thorium dates on speleothems show that calcite sometimes formed during Marine Isotope Stage 3. In a shallow cave system, such growth requires liquid water moving through the limestone and is taken to indicate intervals when mean annual temperatures rose above freezing. The cave record cannot assign a precise temperature to Derryvree or prove that every Irish region experienced the same conditions simultaneously. It does, however, show that the late Pleistocene climate at Ireland's Atlantic edge shifted on millennial scales, in step with wider North Atlantic climatic variability.

For people and animals, these environmental shifts mattered more than any imagined frontier. Rivers and pools offered water; exposed limestone caves offered dens, traps, shelters and places where bones could accumulate; open ground created routes across which herds and predators moved. But the coastlines familiar today did not exist. Sea level was much lower globally, and the surrounding shelf had a different form, although glacial ice and marine waters made connections between Ireland, Britain and continental Europe variable rather than straightforward. The sensible conclusion is that animal movements into Ireland were possible during favourable phases, not that a simple permanent land bridge can be drawn for this exact date.

Animals at the Western Edge

Cave collections, especially from Castlepook Cave near Doneraile in north County Cork, provide the principal evidence for Ireland's larger Pleistocene fauna. Work on Irish Quaternary animal remains has identified a changing assemblage that included reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, hare, arctic lemmings and spotted hyaena. These species did not necessarily all share Castlepook at one moment: cave deposits may contain material accumulated over long periods, and many early excavations disturbed original layers. The strongest use of the assemblage is therefore ecological. It establishes that Ireland, at different stages before the Last Glacial Maximum, formed part of a wider north-west European zone through which cold-adapted mammals could disperse.

Reindeer are particularly evocative but should not be made to carry more historical weight than the evidence permits. Their presence indicates open, cold-country habitat and the availability of grazing, not a known annual migration route. Mammoth and hyaena remains likewise show that the island could support, or intermittently receive, large herbivores and powerful carnivores. A 2026 sedimentary ancient-DNA study from Castlepook, currently a preprint rather than a peer-reviewed article, reports genetic traces consistent with faunal connectivity between Ireland and Eurasia before the Last Glacial Maximum. It reinforces a long-standing interpretation of interchange, while remaining provisional evidence whose detailed conclusions may change after review.

The Human Question

There is no securely excavated settlement, hearth, tool assemblage, human burial, named group or continuous population from Ireland that can be assigned to 31,653 BCE. Consequently, there is no responsible basis for describing political authority, diplomacy, warfare, language, religious practice, trade institutions or a social hierarchy on the island at this date. Nor may later labels such as Gaelic, Celtic or Irish be projected back into this period. The established evidence for substantial, sustained human settlement belongs far later, in the Mesolithic after the final retreat of the great ice sheets.

There is, however, one debated and important clue from Castlepook. A reindeer femur from an older cave collection has been publicly reported as about 33,000 years old and as bearing a deep incision interpreted by zooarchaeologist Ruth Carden as a stone-tool butchery mark. If that interpretation is upheld, it may indicate that Palaeolithic people processed a reindeer in Ireland during a broadly comparable pre-glacial phase. Yet the specimen was not recovered from a modern, intact occupation layer, and the date is the age of the animal bone rather than automatic proof of when the mark was made, who made it, or how long anyone stayed. Recent excavation has located surviving cave sediments but reported no cultural artefacts in its 2022 fieldwork. The bone is thus a potentially transformative trace of a visit, not proof of a settled society.

Everyday Life Beyond Recovery

If humans did reach Ireland in this wider period, their most plausible activities would have been short-term and mobile: moving through a cold, resource-variable landscape, seeking animal carcasses or game, water, shelter and workable stone. That is an inference from the setting, not direct evidence for a camp at Derrynree or Castlepook. No Irish artefacts of this age allow archaeologists to identify a particular Upper

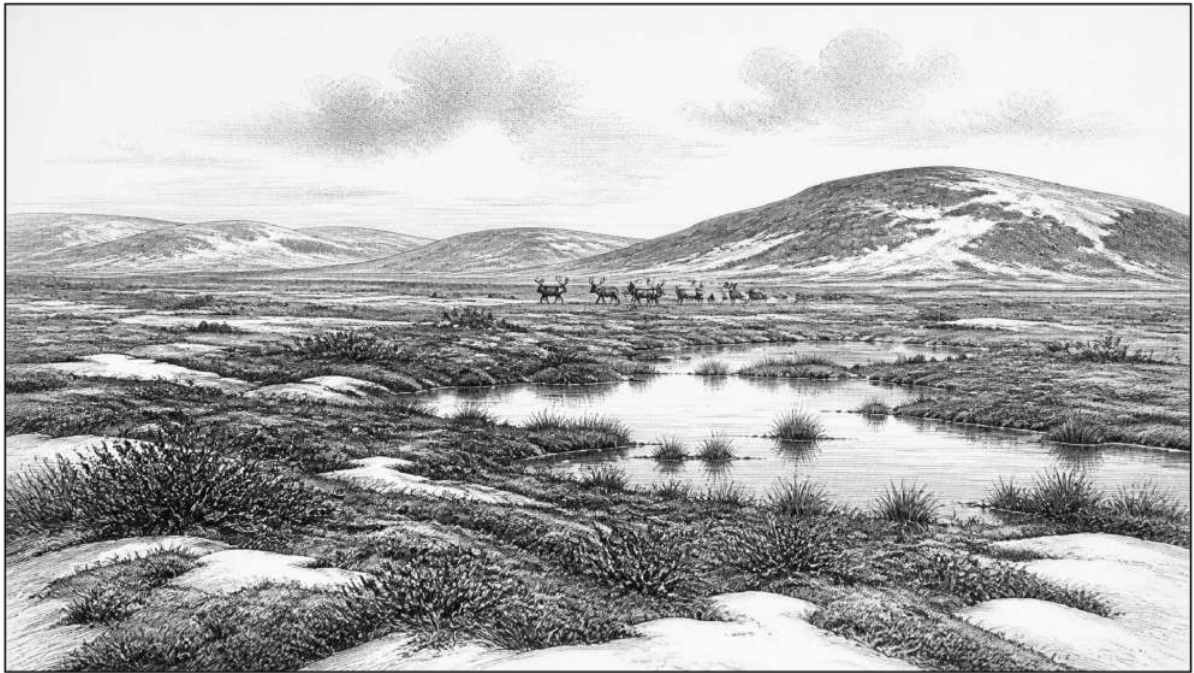
Palaeolithic tradition, reconstruct clothing, determine family size or describe food-sharing practices. Equally, there is no material basis for religious claims: caves may later have acquired symbolic significance in many societies, but Ice Age animal bones alone do not reveal rites, stories or beliefs.

The dominant development around this modernly numbered year was environmental transformation. Freshwater silts beneath a Fermanagh drumlin record an ice-free tundra wetland; caves in Cork preserve fragments of a wider animal world; and ice-sheet research shows that a far more extensive glaciation was approaching. These records make Ireland's deep past intelligible without inventing a dated event. They reveal an island-edge landscape with living waters, open ground, mobile fauna and perhaps fleeting human contact—soon to be reshaped by the expanding ice that would erase much of what had come before.

Chapter 049 of 100

31652 BCE

Crag Cave's Thaw Windows^[49]



The label 31,652 BCE is a modern chronological convenience, not a year that anyone in Ireland could have recognised or recorded. There were no calendars, writing systems, named polities or dated events from which to construct a year-by-year narrative. Arithmetically, it falls about 33,602 years before AD 1950, the conventional ‘present’ used in radiocarbon reporting. That calculation should not be mistaken for archaeological precision: at this depth of time, radiocarbon measurements require calibration and are normally expressed as broad probability ranges. The responsible question is therefore what evidence can illuminate Ireland *around* this horizon.

The answer belongs to the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the last Ice Age. Ireland’s record is exceptionally fragmentary. Subsequent glaciers eroded old ground surfaces, moved sediments and buried others beneath till; early cave excavations also removed much material before modern standards of recording existed. No securely dated Irish hearth, dwelling, burial, tool-making floor or settlement can be assigned to 31,652 BCE. There is consequently no evidential basis for describing rulers, diplomacy, warfare, formal religion, agriculture or an established trading system. What survives instead is a difficult archive of sediment, cave bone and cave calcite.

An Interval Rather Than a Date

The nearest useful terrestrial evidence comes from Derryvree near Maguiresbridge in County Fermanagh. Roadworks exposed a freshwater deposit of organic silts and sands trapped between two bodies of glacial till. Such a sequence matters because it indicates an interval in which water, vegetation and sediment accumulated before later ice overran the area. A radiocarbon determination from the organic material, once calibrated, has been presented as a broad range of roughly 36,900–31,700 calibrated years

before present. The nominal year considered here lies within that window, but Derryvree does not document a particular year, season or human generation. It is a time-depth record spanning many centuries or millennia, with uncertainties inherent in both dating and correlation.

Its plants and insects nevertheless offer a restrained picture of the landscape. The evidence indicates open, cold-country vegetation: mosses, sedges, grasses, herbs and low shrubs rather than a closed woodland. Wet hollows and shallow freshwater could support localised plant communities even where the wider terrain was exposed and treeless. In modern terms, the nearest analogy is not a single modern habitat but a mosaic of tundra-like ground, sedgy wetland, stream margins, bare mineral soil and periglacial surfaces. Snow cover, wind exposure, soil moisture and summer warmth would have made sharp differences over short distances.

This was not necessarily a uniformly frozen Ireland. MIS 3 was marked around the North Atlantic by abrupt shifts between relatively milder interstadials and harsher stadials. Glaciers advanced and withdrew, river regimes changed and suitable habitats expanded or contracted. The Irish deposits are too sparse to map those shifts year by year across the island. They do, however, warn against two equally misleading pictures: an Ireland continuously buried beneath ice, or an Ireland steadily open and hospitable. Conditions varied by region and through time. At roughly 33,600 calibrated years before present, Ireland was still before the later local maximum of the British–Irish Ice Sheet, generally placed around 27,000 years ago, but was moving through an era in which ice margins and ice-free refuges could change dramatically.

Liquid Water at Crag Cave

Crag Cave in County Kerry supplies a second, very different environmental archive. Uranium-series dating of broken and reworked speleothems—stalagmites, stalactites and flowstone—shows episodes of calcite growth through much of the last glacial period, including the latter part of MIS 3. Calcite formation in this shallow cave required liquid water to percolate through soil and limestone and is therefore evidence against permanently frozen ground at those particular times. It does not prove warm or forested conditions, and the cave dates cannot furnish a weather report for 31,652 BCE. Yet they show that south-west Ireland could experience milder intervals in which water moved through the karst and biological carbon dioxide again entered the cave system.

The contrast between Derryvree's northern freshwater sediments and Crag Cave's southern calcite is important. Neither site stands for all Ireland, but together they demonstrate environmental diversity and change. Cave growth ceased in colder phases, while freshwater basins could be overwhelmed, frozen, drained or later covered by glacial deposits. The landscape that survives in the record is therefore one of interruptions: brief windows for sedimentation or calcite growth between colder episodes that destroyed, displaced or concealed evidence.

Animals Crossing a Changing Land

Irish cave collections provide the strongest evidence that sizeable mammals occupied parts of the island during the broader pre-Last Glacial Maximum period. Castlepook Cave, near Doneraile in north County Cork, is particularly significant. Material collected there includes reindeer, brown bear, spotted hyaena, wolf or fox, hare, lemmings, giant deer and woolly mammoth remains. Not every species need

have lived there at the same moment: a cave is a trap, shelter, den and bone-collecting place, not a photograph of one living community. Many of the original deposits were disturbed during antiquarian excavation, so associations once assumed between bones must be treated cautiously.

Radiocarbon dating undertaken by the Irish Quaternary Fauna Project and later reassessment nevertheless place much of Ireland's cave fauna within the wide span from at least about 45,000 to 20,000 years ago. This establishes repeated animal movement into Ireland during favourable phases of the Late Pleistocene. Reindeer and cold-adapted small mammals suit the open environments suggested by Derrynvree; hyaena and large herbivores show that a more complex food web could operate when habitat and access allowed. Carnivores may have accumulated bones in caves, while natural deaths, water transport and later disturbance added further material. A faunal list is therefore evidence for presence, not proof of a stable ecosystem at one fixed date.

How these animals reached Ireland remains an important question. Lower global sea levels altered the Irish Sea basin and reduced marine barriers, but changing shorelines, estuaries, ice margins and tidal channels mean that a simple, permanent 'land bridge' should not be imagined. Some movements may have been possible over exposed terrain or ice-associated routes; others may have depended on temporary connections or narrow crossings. The cave fauna shows that access occurred often enough for animals to arrive. It cannot, by itself, specify the route, season or duration of every migration.

The Castlepook Human Question

Castlepook also contains the most provocative possible clue to people in Ireland at this remote horizon: a reindeer femur from an old collection bearing a deep surface mark interpreted by Ruth Carden as consistent with cutting by a sharp stone tool. The bone has been widely reported as approximately 33,000 years old. If the mark is confirmed as anthropogenic and securely related to the animal's age, it would push evidence for human activity in Ireland far earlier than the well-established post-glacial record.

That conclusion remains deliberately provisional. The specimen was not recovered from a newly excavated, undisturbed camp floor alongside a diagnostic stone-tool assemblage, hearth or butchered animal group. Old cave collections have incomplete contextual information, and bone marks can require detailed taphonomic study to distinguish human cutting from carnivore damage, sediment abrasion, excavation damage or other processes. The responsible interpretation is not that Ireland possessed a settled Upper Palaeolithic population in 31,652 BCE. It is that a single object raises the possibility of a brief human visit or butchery episode in the wider period, a hypothesis that continuing work at Castlepook may test.

If people did reach the island, their presence would almost certainly have been small-scale and mobile. Across north-west Europe, human groups at this time were hunter-gatherers who relied on close knowledge of animals, seasonality, stone resources, shelter and routes through dangerous terrain. That wider comparison can suggest possible ways of life, but it cannot supply missing Irish facts. No Irish evidence presently identifies a camp, family group, language, ritual practice, exchange partnership or political relationship. Absence of material proof does not demonstrate an absence of thought, social bonds or belief; it defines what history can responsibly claim.

No Politics, But a Living Landscape

In political terms, then, there were no demonstrable Irish states, chiefs, borders, alliances or conflicts. In economic terms, there is no evidence for farming, herding, metalworking, markets or regular long-distance trade. ‘Settlement’ must be used with particular care: the archaeological record does not establish permanent habitation. The important history is environmental and biogeographical. Freshwater plants at Derryvree, episodic drip-water calcite at Crag Cave and the animal remains of Castlepook show that parts of Ireland repeatedly became habitable for plants and animals during an otherwise severe glacial world.

The most important development around this nominal date was therefore neither a recorded event nor a human institution. It was instability itself: the opening and closing of ecological opportunities as climate altered water supply, vegetation, ice cover and routes into the island. Ireland was a shifting western edge of the European Pleistocene world. Its surviving evidence is thin, but it is enough to replace the old image of a featureless frozen void with a more credible one—cold, exposed and often hostile, yet intermittently watered, inhabited by animals and perhaps, still uncertainly, visited by people.

Chapter 050 of 100

31651 BCE

Mammoth Cave, Derryvree, and Ice^[50]



The modern label 31,651 BCE cannot be treated as a year in the historical sense. No calendar was used in Ireland at this depth of time, and neither archaeology nor palaeoenvironmental science can identify an event, a person or a community in one particular annual interval. In conventional archaeological terms, the date falls roughly 33,600 years before AD 1950, within the later part of the Late Pleistocene and broadly within Marine Isotope Stage 3 (MIS 3), a climatically unstable phase of the last glacial period. The appropriate chronology is therefore a set of calibrated ranges and environmental phases, not a precise anniversary. Ireland at this point is known chiefly through sediments, fossils, caves and the traces left by advancing and retreating ice.

An Interval Rather Than a Year

The closest Irish evidence comes from local archives whose dates span centuries or millennia. At Derryvree, near Maguiresbridge in County Fermanagh, freshwater organic sediments lie between two layers of glacial till. The sequence records an interval when ice had withdrawn or was absent locally, before a later advance buried the deposits. A radiocarbon determination from Derryvree has been calibrated broadly to approximately 36,900–31,700 years before present. The notional date considered here sits within that wide range, but this does not make the deposit a record of conditions on one day, season or year. At Greenagho, also in Fermanagh, organic material beneath till has produced a calibrated range of roughly 37,200–35,700 years before present. Together, such deposits show that a simple picture of Ireland as continuously and uniformly ice-covered is untenable for this part of the last glacial period.

Even so, the evidence must not be stretched beyond its scale. Derryvree was a particular basin in the north of the island, not a weather station for every coast, valley and upland. Its plant and insect remains illuminate a local landscape, while cave bones from Cork offer another, separately dated glimpse of

animal life. Ice margins and sea levels changed repeatedly, and the extent of the growing British–Irish Ice Sheet remains a subject of active reconstruction. What can responsibly be said is that the full Last Glacial Maximum, conventionally placed much later, around 26,500–19,000 years before present, had not yet reached its greatest extent. Ireland was approaching a harsher and more glaciated future, but its landscapes were still regionally varied.

Open Pools Beneath a Cold Sky

The Derryvree deposits suggest a cold, open tundra or muskeg environment rather than the familiar green, wooded Ireland of later millennia. Pollen and plant remains indicate grasses, sedges, juniper and herbs; mosses and insect evidence point to wet ground with pools rich in decaying vegetation. This was not necessarily a featureless, snowbound plain. In summer, shallow water, damp sedge beds and sheltered ground could have supported concentrated plant growth and insects. In winter, however, the evidence indicates severe cold. The local scene was likely marked by strong seasonality, exposed ground, frost action and a short growing season, with little or no tree cover.

Such evidence matters because it gives texture to an otherwise almost silent age. Rivers and meltwater channels would have shifted sediment; wet hollows could trap pollen, seeds and beetle remains; limestone caves could collect animal bones. The physical Ireland visible today still bears the much later and more extensive effects of glaciation: drumlins, eskers, altered drainage and glacial deposits. But these landforms cannot simply be projected backwards as a finished landscape. Around this date, the country's surface was being repeatedly remade by cold-climate processes, and the ice sheet that would scour and bury much earlier evidence was still developing.

Animals at Castlepook

In north County Cork, Castlepook Cave, also called Mammoth Cave or Doneraile Cave, provides the most evocative evidence for the broad period. The cave has yielded Pleistocene remains including woolly mammoth, reindeer, spotted hyaena, brown bear and Arctic lemming. These animals do not demonstrate that every species lived together at precisely 31,651 BCE: cave deposits accumulated over long spans, and many were disturbed during early excavations. They do show that Ireland, at different times during the late Pleistocene, formed part of a wider north-west European world in which cold-adapted herbivores and predators could reach suitable habitats.

Reindeer were particularly well suited to open, cold country, while mammoths evoke the grass- and herb-rich environments often described as mammoth-steppe. Hyaenas are equally significant. A cave can be a den, a refuge, a trap, a place where water moves bone, or a deposit altered by later excavators; it is not automatically a human campsite. Carnivores may have carried carcass parts underground, gnawed them or mixed remains of differing dates. Consequently, Castlepook's bones provide strong evidence of animal presence and ecological possibility, but weak evidence for a single, intact ancient landscape. The responsible picture is of mobile animals using an intermittently habitable Irish landmass, not of a stable prehistoric menagerie frozen in one moment.

The Reindeer Femur Question

A reindeer femur fragment from Castlepook has made this period central to the question of Ireland's earliest people. The bone was reported in 2021 as bearing a deep incision interpreted as a mark made by a stone tool while fresh, and it has been presented as dating to about 33,000 years ago. If that interpretation is sustained, it is evidence that one or more Upper Palaeolithic people processed a reindeer carcass in Ireland during the broad later MIS 3 period. It would be an important indication of human activity far earlier than the island's previously clearest traces.

Yet the qualification is essential. One marked bone is not a settlement. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, human remains, ornament, cave art or food-processing area of this age has been identified in Ireland. Nor can the bone reveal whether people killed the animal, found it already dead, removed meat, hide, sinew or marrow, or remained in the district for hours, days or longer. The original cave investigations, led in the early twentieth century by Richard J. Ussher, removed much sediment, while subsequent work has emphasised the disturbed and fragmentary character of what survives. The femur is therefore best understood as a significant but limited clue: possible evidence of a visit or episode of carcass processing, not proof of a permanent population.

No Kingdoms, Farms or Monuments

There is no evidential basis for describing political institutions, named peoples, diplomacy, organised warfare, leaders, laws or territorial boundaries in Ireland at this date. There is likewise no basis for identifying formal religion, temples, graves, monuments, artistic traditions or systems of learning. Such absences are not merely gaps waiting to be filled with familiar later-Irish themes; they are the central historical fact of the evidence. If humans did reach the island, they left no known material record from which social rank, language, kinship, ritual or identity can be reconstructed.

The same restraint applies to economy and trade. There was no farming: cereal cultivation and livestock husbandry arrived in Ireland tens of millennia later, in the Neolithic. There is no evidence for exchange routes, boats, imported materials or regular commerce around 31,651 BCE. Lower sea levels changed the outlines of the surrounding shelf, but they do not license an assumption that Ireland was connected to Britain or continental Europe by an easy land bridge at this particular time. The sea, ice, exposed shelf, islands and changing channels formed a complex and shifting barrier. Any human arrival, if the Castlepook mark is correctly interpreted, would have required movement across a difficult north-west European landscape, but the route remains unknown.

A Fragile Human Horizon

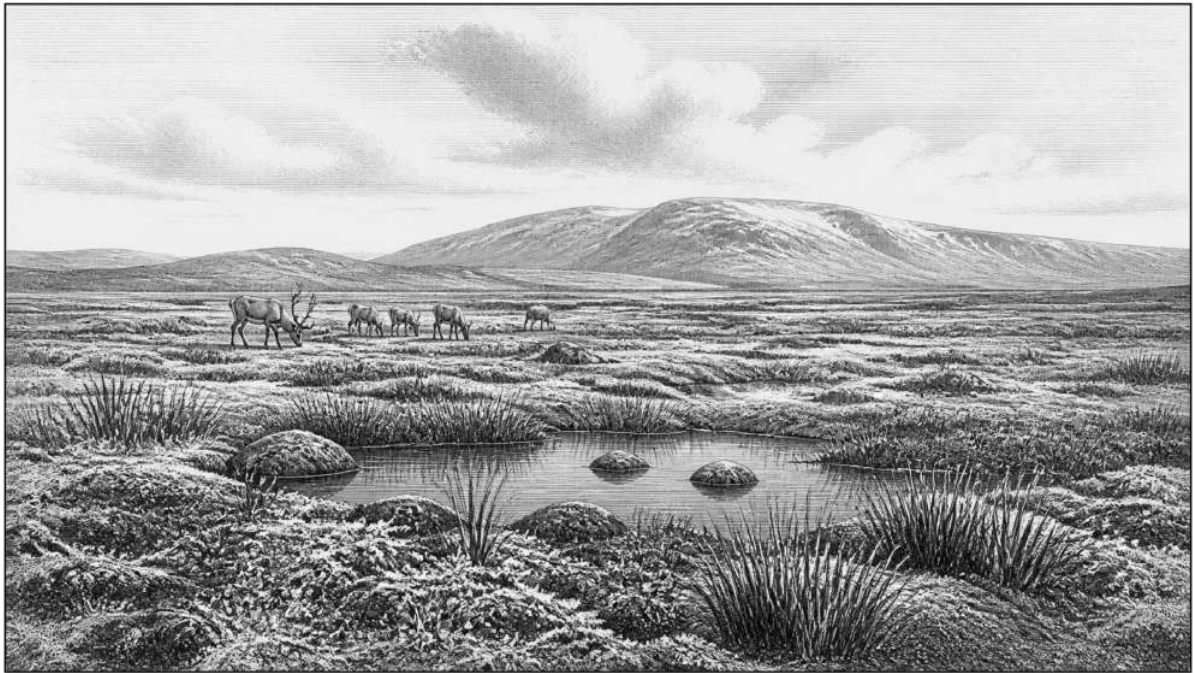
The larger European context helps to explain why the Castlepook possibility matters without turning it into certainty. Elsewhere in Europe, Upper Palaeolithic hunter-gatherers possessed sophisticated stone technologies, mobile subsistence strategies and cultural traditions that sometimes included personal ornaments and cave art. None of those attributes can be assigned directly to Ireland from the present evidence. At most, the marked femur may suggest that Ireland lay occasionally within the far western reach of people accustomed to exploiting large animals in cold environments. It cannot identify a cultural label, demonstrate continuity with later Irish populations, or establish that the island was regularly occupied.

The most important development around this notional date was therefore environmental rather than political: Ireland was a cold, changing territory at the edge of an enlarging ice-sheet system, with local wetlands and open ground capable of supporting specialised flora and fauna. Derryvree preserves the environmental record of that world; Castlepook preserves its animals and a disputed hint of human action. In the following millennia, expanding ice would erase, rearrange and conceal much of the landscape and any fragile traces left upon it. For 31,651 BCE, Irish history is not a story of recorded events. It is a carefully bounded reconstruction of tundra pools, mobile herds, cave predators, intermittent ice and the possibility that people briefly entered a landscape on the threshold of profound glacial change.

Chapter 051 of 100

31650 BCE

Castlepook's Marked Femur^[51]



31,650 BCE is not a year that can be recovered from Ireland's archaeological record. It is a modern chronological label, equivalent by simple conversion to about 33,600 calendar years before present, where "present" conventionally means AD 1950. No Irish written source, annually resolved environmental sequence, settlement layer or radiocarbon result can identify events within that particular twelve-month span. The responsible way to approach it is through broad calibrated ranges and the Late Pleistocene setting to which it belongs: Marine Isotope Stage 3 (MIS 3), an unstable middle phase of the last Ice Age.

On the Greenland ice-core timescale, this approximate horizon falls within Greenland Interstadial 6, a relatively milder interval between colder episodes, beginning around 33,740 years before AD 2000 and ending with the onset of Greenland Stadial 6 around 33,360 years before AD 2000. That comparison is useful as a North Atlantic climatic framework, not as a daily weather report for Ireland. It cannot tell us whether a particular Irish valley was ice-free, snow-covered or occupied in a particular season. Ireland's evidence is patchy, regional and often disturbed by later ice, water and excavation.

An Island in a Changing Ice Age

Ireland was not yet in the fullest grip of the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest Late Pleistocene extent, broadly after 27,000 years ago and especially around 25,000–23,000 years ago in many reconstructions. But it would be wrong to picture a settled, temperate island awaiting the ice. During MIS 3, glaciers repeatedly expanded and contracted, rivers shifted across exposed ground, and sea level stood far below its modern position. The outlines of coastlines, channels and lowlands differed greatly from those on a modern map.

The later ice sheet profoundly altered the surviving record. Glacial erosion removed or redeposited many older land surfaces; meltwater reworked sediments; and rising sea levels later drowned former coastal plains. For this reason, the absence of campsites, hearths or stone tools from c. 31,650 BCE is not proof that no person ever set foot on Ireland. Equally, loss of evidence cannot be used to invent a population. What survives allows only a restrained conclusion: parts of Ireland supported cold-stage ecosystems during this wider period, while evidence for a human visit is exceptionally slight and depends chiefly upon one remarkable animal bone.

Freshwater Beneath a Drumlin

The most informative Irish environmental evidence comes from Derryvree near Maguiresbridge in County Fermanagh. Road works in 1969 exposed organic freshwater silts and fine sands sealed between two thick layers of till beneath a drumlin. The sequence has a clear relative meaning. Ice deposited the lower till; during a subsequent ice-free interval, water, organic sediment, plants and insects accumulated; later ice advanced and buried the deposit beneath another till.

A radiocarbon determination from the organic material was reported as 30,500 radiocarbon years BP, with a large laboratory uncertainty of +1,170/–1,030 years. When calibrated, that result produces a wide calendar range, approximately 36,900–31,700 cal BP in published discussion. The range overlaps the modern label 31,650 BCE, but does not pinpoint it. It is therefore evidence for an interval of cold, ice-free conditions in south Fermanagh, rather than evidence for a named occurrence in that year.

The Derryvree fossils indicate an open, largely treeless landscape. Herb pollen, mosses, aquatic plant remains and insect evidence point towards tundra or muskeg-like ground: wet, mossy places with sedges, grasses, herbs, shallow pools and slow water, set among exposed mineral surfaces affected by frost. A few grains of pine or hazel pollen do not establish nearby woodland, since pollen can travel long distances or be redeposited. The stronger inference is of sparse vegetation rather than forest. This was not a featureless white wilderness: short growing seasons could support freshwater plants, invertebrates and grazing animals. Yet it was a severe environment, with long winters and great sensitivity to climatic swings.

The Animals of Castlepook

In north County Cork, Castlepook Cave near Doneraile preserves Ireland's most important cave assemblage for the period before the Last Glacial Maximum. The cave's old excavations yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. They should not be treated as one perfectly contemporary herd or a complete list of every species on the island. Cave deposits commonly accumulate over long periods and can be altered by carnivores, water, roof fall and nineteenth- and twentieth-century collecting methods. Nevertheless, the assemblage demonstrates that Ireland formed part of a wider north-west European zone through which cold-adapted mammals moved.

Reindeer are especially evocative because they fit open, seasonal landscapes, but they do not by themselves reveal a migration route or a human hunting economy. Mammoth and giant deer likewise suggest productive patches of grassland, herb-rich steppe or tundra vegetation, while hyaenas and wolves indicate predators and scavengers within the food web. Caves are poor substitutes for a living landscape: a hyaena may carry bones in, water may move them, and animals may die far from the chamber in which their remains were recovered. Castlepook is best understood as a bone archive, not as an Ice-Age village.

Modern redating has also transformed the significance of the site. Earlier radiocarbon measurements on Irish cave bones were sometimes affected by the limits of former pretreatment methods. Improved ultrafiltration has shown that at least some Castlepook material is substantially older than dates returned in the 1990s. This matters beyond technical detail. It places elements of the cave fauna securely in MIS 3 and shows why old determinations, even from famous finds, must be revisited as scientific methods improve.

A Single Human Clue

The object most directly relevant to this article is a reindeer femur from Castlepook. A deep mark on the bone has been interpreted by zooarchaeologist Ruth Carden as damage made with a sharp stone tool during butchery. The bone has been publicly presented by County Cork heritage specialists as dating broadly to around 31,000 BCE, and the find has therefore been described as evidence of human activity in Ireland about 33,000 years ago.

Its importance should not obscure its limits. A radiocarbon date establishes the age of the animal's death within a statistical range; it does not by itself date the instant at which a mark was made, the place where the animal was killed, or the duration of any human presence. Nor has Castlepook yet produced a securely associated stone-tool assemblage, hearth, dwelling, burial, human bone, ornament or art of this age. If the mark is anthropogenic, it records skilled carcass processing with a stone edge. It may represent a brief hunting or scavenging visit by Upper Palaeolithic people, perhaps followed by carnivores carrying discarded remains into the cave. It does not demonstrate a permanent settlement at Doneraile, a continuous Palaeolithic population, or a direct ancestral link to later inhabitants of Ireland.

No human remains identify the people concerned. It would be reasonable, in the wider European context, to consider *Homo sapiens* rather than Neanderthals, but the Castlepook bone cannot establish the maker's identity, language, kinship, clothing or origin. At this depth of time, even apparently simple statements must distinguish the physical evidence—a dated reindeer bone with a marked surface—from the interpretation placed upon it.

Society Beyond Recovery

There is no evidence from Ireland around this horizon for political institutions, chiefs, territories, diplomacy, warfare, trade networks, agriculture or permanent settlement. There is likewise no Irish evidence for formal religion, burial rites, visual art, music or systems of learning. These silences are not claims that Ice-Age people lacked social lives or beliefs; Upper Palaeolithic communities elsewhere in Europe had sophisticated technologies and cultural practices. They mean that no such practice can responsibly be assigned to Ireland at c. 31,650 BCE.

The practical requirements of a possible short visit are easier to state. Anyone processing a reindeer carcass would have needed knowledge of animal anatomy, sharp-edged stone technology, food preservation or prompt consumption, and safe movement through a dangerous cold-country landscape shared with large predators. Such skills belong to the broader human capacity visible across Upper Palaeolithic Europe. Whether they were exercised once, repeatedly, or not at all in Ireland beyond the Castlepook trace remains unknown.

Routes, Water and Uncertainty

Lower global sea levels exposed land now beneath the Irish and Celtic Seas, changing distances and possible routes between Ireland, Britain and continental Europe. But lowered water is not automatically a land bridge, and glacial ice, proglacial lakes, tidal channels and rugged terrain could all obstruct passage. The precise palaeogeography of the Irish Sea basin at this point remains model-dependent. It is safer to say that the geographical setting differed radically from today and that animal movement into Ireland was possible, as the faunal record proves, than to claim a known route for people.

The largest development relevant to Ireland in this notional year was therefore environmental, not political: a climatically volatile Atlantic-edge landscape was moving towards the major glaciation that would later cover much of the island and erase much of its earlier archaeological surface. Derrynvree preserves the wetlands of an ice-free cold interval. Castlepook preserves traces of animals moving through a southern limestone landscape, and perhaps the cut of a human tool on a reindeer bone. Together they offer a compelling but deliberately incomplete beginning to Ireland's known human story.

Chapter 052 of 100

31649 BCE

Fermanagh's Birm-166 Deposit ^[52]



“31,649 BCE” is a modern calendar label, not a date that people in prehistoric Ireland could have recognised or recorded. No event, ruler, settlement foundation or human life can responsibly be assigned to that single year. In archaeological terms, it falls approximately 33,600 calendar years before present (cal BP, where “present” is conventionally AD 1950), in the later part of Marine Isotope Stage 3, a fluctuating interval of the last Ice Age. At this depth in time, radiocarbon measurements carry substantial uncertainty and must be calibrated as ranges. The most useful Irish evidence is therefore not an annual chronicle but a small, uneven archive of buried sediments, fossil plants, insects and animal bones.

The best directly relevant environmental record is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed organic silts and fine sands sealed between two separate sheets of glacial till. The deposit, known from its laboratory radiocarbon determination as Birm-166, produced an uncalibrated age of 30,500 BP with a large uncertainty. Subsequent calibration places the broad age range of the freshwater sequence at roughly 36,900–31,700 cal BP. The notional year 31,649 BCE therefore lies within the wider chronological horizon illuminated by Derryvree, but not at a point that can be distinguished within it.

A Wetland Between Ice Advances

Derryvree matters because the later Irish ice sheet destroyed, reworked or concealed much of the older landscape. Here, however, an earlier freshwater environment survived beneath later glacial deposits. The silts accumulated in a low, wet basin at a time when this part of Fermanagh was not overwhelmed by

ice. Mosses, sedges, grasses, herb pollen and insect remains point to a cold, open, periglacial landscape. “Periglacial” does not simply mean frozen solid: it denotes ground shaped by severe cold, seasonal freezing and thawing, sparse vegetation, meltwater and unstable soils around an ice-sheet margin.

The scene was not one of modern Irish pasture, hedgerow or woodland. Trees were at most extremely scarce locally. Plant remains indicate treeless tundra-like vegetation, including damp moss- and sedge-rich ground around shallow water, set beside more exposed mineral soil. Juniper may have occupied favourable patches. The landscape probably changed markedly across short distances: pools and saturated hollows could sit near frost-shattered slopes, wind-blown sediment and seasonally dry ground. Such mosaics supplied particular habitats for insects and small animals, and, in better seasons, grazing for larger mammals.

Yet Derryvree should not be mistaken for a complete map of Ireland. It records one basin in what is now northern Ireland, and its pollen was poorly preserved. A tiny amount of tree pollen cannot prove nearby forest, since pollen can travel long distances or be redeposited. Nor can one freshwater deposit reveal the temperature, snow cover or vegetation of every valley and coast. Its significance is more precise: it securely demonstrates that an ice-free, cold freshwater environment existed in Fermanagh during part of later MIS 3, before a later advance of glacier ice covered it.

Not Yet the Glacial Maximum

At this broad date, Ireland was moving towards, but had not yet reached, the Last Glacial Maximum. The best current reconstructions place the major expansion and maximum extent of the last British–Irish Ice Sheet later, principally within the period from about 27,500 to 19,000 years ago, with extensive Irish glaciation especially evident after roughly 24,000 cal BP. Southern Irish stratigraphic work has shown that many tills once assigned to much older glaciations were in fact laid down during the last glacial cycle. The ice that eventually moulded drumlins, scoured bedrock and deposited widespread till was thus part of Ireland’s future at 31,649 BCE, not a condition that can simply be projected unchanged backwards onto this date.

Climate during MIS 3 was unstable. Greenland ice cores show abrupt alternations between relatively milder interstadials and colder stadials, although the exact local effect in Ireland must be reconstructed cautiously rather than read directly from Greenland. The Derryvree deposit represents an environmentally viable interval amid those larger oscillations. Its open vegetation and cold-adapted insect fauna indicate harsh conditions, but the presence of freshwater sediment and plant life also shows that the region was not an unbroken sterile ice desert. Freeze-thaw processes, snowmelt and waterlogging were likely more consequential to everyday ecology than any single annual temperature figure could convey.

Lower sea levels changed the geography around Ireland as well as its climate. Much of the continental shelf was exposed during colder phases, and Britain remained connected to continental Europe for parts of the last glacial period. Ireland’s own connection to Britain is more complicated. Geological research rejects a simple, enduring southern Irish Sea land bridge; any traversable route depended on sea level, ice extent and local topography, and may have involved ice, temporary islands or northern routes rather than open dry land. For animals—and potentially for people—movement westward was possible only through a shifting, hazardous north-west European frontier. It must not be imagined as a permanent highway.

Animals and the Cave Record

The fossil evidence from Irish caves gives a complementary, if equally imperfect, view. Collections from Castlepook Cave near Doneraile in north County Cork include remains attributed to reindeer, woolly mammoth, giant deer, brown bear, Arctic fox, lemmings, hare, wolf and spotted hyena. The Irish Quaternary Fauna Project showed that a varied mammal fauna reached Ireland during intervals between at least about 45,000 and 20,000 years ago. More recent reassessment has stressed that many old cave collections were excavated before modern stratigraphic standards and that some early radiocarbon determinations need revision. Cave bones establish the presence of species in broad periods; they do not automatically prove that every listed animal shared the same valley, season or generation.

Even so, the fauna is an important corrective to the idea of an empty Ireland. Reindeer and lemmings suit the open, cold conditions suggested at Derryvree. Mammoth and giant deer indicate that, during favourable phases, substantial herbivores used at least parts of the island. Spotted hyenas are especially revealing: a cave may have been a carnivore den, a place into which prey remains were dragged, rather than a natural census of the nearby living landscape. Carnivore damage, water movement, excavation disturbance and later mixing all complicate interpretation. The cave record documents animal mobility and ecological opportunity, not a stable, fully known Ice Age menagerie.

For people, the evidence is far more limited. A reindeer bone from Castlepook has been reported as bearing a possible human-made modification and as dating to around 33,000 radiocarbon years ago. If the mark is confirmed as anthropogenic and securely associated with the dated bone, it may indicate a very early human visit to Ireland during MIS 3. That proposition remains under investigation. It is not a securely excavated camp, and it does not provide a house, hearth, tool assemblage, burial, human DNA or continuous occupation. The best-established direct evidence for human activity in Ireland is much later: a cut-marked brown-bear bone from Alice and Gwendoline Cave in County Clare, dated to the opening of the Younger Dryas around 12,800–12,600 cal BP.

No Kingdoms, No Recorded Communities

Accordingly, there is no responsible account of Irish political affairs, diplomacy, warfare or leadership for 31,649 BCE. There were no known polities, borders, named peoples or institutions on the island, and no writing from which beliefs or social relationships can be recovered. Nor can historians infer a resident community from the Derryvree wetland or Castlepook fauna. The possibility of brief human incursions is different from proof of a population. Any visitors would have entered a landscape in which cold, food availability, snow, predators and the changing route across the surrounding shelf imposed severe constraints.

The same restraint applies to everyday life, religion, culture, learning, economy and trade. No Irish dwelling, hearth, worked lithic assemblage, ornament, grave, ceremonial site or exchange object has been securely dated to this horizon. We may reasonably say that mobile Upper Palaeolithic communities elsewhere in north-west Europe possessed sophisticated knowledge of animals, stone, seasonal movement and changing terrain. But applying their technologies, languages, rituals or social structures to Ireland would be interpretation by analogy, not Irish evidence. There is no basis for describing trade networks, chieftains or religious practice here.

What can be stated is more modest, and more remarkable. Around this broadly defined date, Ireland was a changing Ice Age landscape rather than the familiar island of fields and woods. In Fermanagh, freshwater, sedges, mosses and cold-adapted insects occupied a basin later buried beneath glacial deposits.

In the south, caves preserve traces of animals that moved through an intermittently habitable world. Ice sheets were gathering strength but had not yet imposed their later maximum extent. The historical subject is therefore not a lost Irish nation or a forgotten annual event, but the fragile evidence for land, water, animals and possible human movement on Europe's north-western edge.

Chapter 053 of 100

31648 BCE

The Awbeg Cutmark Debate^[53]



31,648 BCE is a modern chronological label, not a year that can be recovered from Ireland's archaeological record. No calendar, written account or identifiable individual brings this point in time into focus. At roughly 33,600 calendar years before the radiocarbon convention's "present" of AD 1950, it belongs to the later part of the Pleistocene and to Marine Isotope Stage 3 (MIS 3), a climatically unsettled phase before the Last Glacial Maximum. The responsible subject is therefore not a year's events, but the archaeological period that overlaps it: a cold, variable Ireland in which ice, water, vegetation and animal movement determined what life could be possible.

A Date Within Broad Ranges

At this depth of time, precision must be handled with care. Radiocarbon years are not calendar years, because atmospheric carbon-14 concentrations have varied; laboratory determinations need calibration against independently dated records. Even after calibration, results commonly produce probability ranges rather than a single date. The relevant evidence at Derryvree, near Maguiresbridge in County Fermanagh, comes from organic freshwater silts and fine sands preserved between two layers of glacial till. Its radiocarbon determination, around 30,500 radiocarbon years BP with a substantial uncertainty, has been calibrated broadly to about 36,900–31,700 calendar years BP. That range overlaps the horizon represented by 31,648 BCE, but it neither records that year nor proves that conditions were identical throughout Ireland.

This distinction matters. Derryvree provides a sequence: an earlier glaciation, an interval in which freshwater sediments accumulated on ice-free or locally ice-free ground, and a later glaciation that sealed the deposit beneath till. It is powerful evidence against a simple image of an island continuously smothered by ice. It is not a weather report for the entire island, still less a diary of a particular season.

The later British–Irish Ice Sheet was dynamic, with growth and retreat varying between regions; recent reconstructions and modelling stress both the scale of the eventual ice sheet and the limits of any single reconstruction. Around this broad period, northern and southern Ireland need not have shared precisely the same conditions.

Derryvree’s Cold Wetland

The biological remains at Derryvree give the clearest Irish picture of the wider landscape. Pollen, plant macrofossils, mosses and insect evidence indicate open, largely treeless vegetation in a cold, periglacial environment. This was not the wooded Ireland familiar from later millennia. Wet, mossy and sedgy ground, shallow pools and herb-rich patches could occur in low-lying basins, while frost action affected soils and drainage. Dwarf shrubs and hardy flowering plants were better suited than trees to short growing seasons and severe winters. “Tundra” and “muskeg” are useful descriptions for aspects of the evidence, provided they are not mistaken for a uniform blanket spread across every hill, valley and coast.

Such a landscape was demanding but not lifeless. Summer productivity around wetlands and open grass-herb communities could support insects, birds and grazing animals; winter imposed a far more exacting regime. MIS 3 climate was marked by abrupt shifts visible in Greenland ice cores and North Atlantic marine records. Ireland stood on the Atlantic edge of that wider climatic system. The fossil deposits show local ecological opportunity, but they also imply instability: plant communities, snow cover, frozen ground, watercourses and animal ranges could change substantially across centuries or millennia. It is safer to picture a mosaic of exposed ground, wetlands and ice-influenced terrain than either a green temperate island or an unbroken white wilderness.

Castlepook’s Faunal Archive

The most important southern counterpart is Castlepook Cave, also called Mammoth Cave or Doneraile Cave, near the Awbeg Valley in north County Cork. Its long, narrow limestone galleries preserved more than two thousand animal bones recovered in antiquarian excavations and later investigations. Geological Survey Ireland describes it as Ireland’s richest site for vertebrate fauna from the period leading towards the Last Glacial Maximum. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, with wolf, Arctic fox, hare and lemmings represented among later cold-stage material. These remains establish that a varied Pleistocene fauna reached Ireland during portions of the last Ice Age.

They do not, however, form one perfectly dated animal community. Cave floors are complex repositories. Carnivores can drag in prey; animals die in or near entrances; water moves bone; excavations undertaken more than a century ago did not always retain the stratigraphic information now expected. Modern re-dating has transformed the picture: some Castlepook samples proved between roughly 5,000 and 12,000 radiocarbon years older than earlier results suggested. The cave thus preserves repeated episodes over a long span, rather than a single scene in which mammoths, hyaenas, reindeer and people can all confidently be placed together. The regional faunal record is evidence for changing populations, not a ready-made Ice Age tableau.

The presence of spotted hyaena is particularly revealing. Hyaenas were major scavengers and predators whose use of caves could shape what archaeologists later recover; bones in such contexts are not automatically evidence of hunting by people. Reindeer imply cold open country and seasonal mobility, while mammoth and giant deer underline how different Ireland’s animal world could be from the

later historic fauna. Yet individual species had their own chronological histories. Revised dates suggest that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, perhaps around 40,000 calibrated years BP. The exact mixture around 31,648 BCE remains unknowable, although the broad environmental setting clearly allowed large herbivores and carnivores to enter Ireland at different times.

The Reindeer Femur

A reindeer femur fragment from Castlepook gives this horizon its most provocative human question. The bone has been reported as approximately 33,000 years old and bears a mark interpreted by palaeozoologist Ruth Carden as a cut made by a sharp stone tool while fresh tissue was being removed. If that interpretation survives further microscopic and contextual scrutiny, it would show that a person handled and probably butchered a reindeer in Ireland long before the final retreat of the ice. It would be an extraordinary extension of the island's Palaeolithic record.

But “if” is essential. The fragment is not a securely excavated camp floor accompanied by stone tools, hearths, shelters, human remains or several independently modified bones. Natural damage, excavation damage and carnivore action can sometimes resemble cultural modification, while the older cave collections have limitations of provenance. Recent fieldwork at Castlepook has located surviving Pleistocene sediments and aims to identify undisturbed deposits, improve dating and seek clearer evidence. For now, the bone supports a carefully worded possibility of brief human activity, not proof of a resident population, a named people, or continuous settlement. It should not be inflated into a claim that Ireland had already been permanently colonised.

People Beyond the Evidence

No political affairs, diplomacy, warfare, leaders or territorial boundaries can responsibly be described for Ireland at this date. Neither can archaeology identify households, language, religion, ritual or systems of learning. There are no Irish graves, monuments, art objects or settlements securely attributable to this horizon. The candidate cutmark cannot tell us the visitor's identity, age, sex, speech, beliefs or number. It cannot establish whether one person, a small travelling group or an occasional succession of visitors reached the island. Silence on these matters is not an omission from the story; it is the most important fact about the surviving record.

Continental comparison nevertheless provides limited context, clearly separated from Irish evidence. In broadly comparable millennia, Upper Palaeolithic communities in western and central Europe made sophisticated stone and organic tools, processed animals, maintained social links over considerable distances and, in many regions, belonged to cultural traditions conventionally grouped within the Gravettian. That does not licence the label “Gravettian” for Castlepook: no diagnostic Irish tool assemblage exists. At most, if people did reach Cork, survival in a cold, fluctuating north-western landscape would have required practical knowledge of animals, weather, clothing, fire and movement. Those are reasonable inferences from the wider human world, not discoveries made in Ireland itself.

Movement, Not Trade

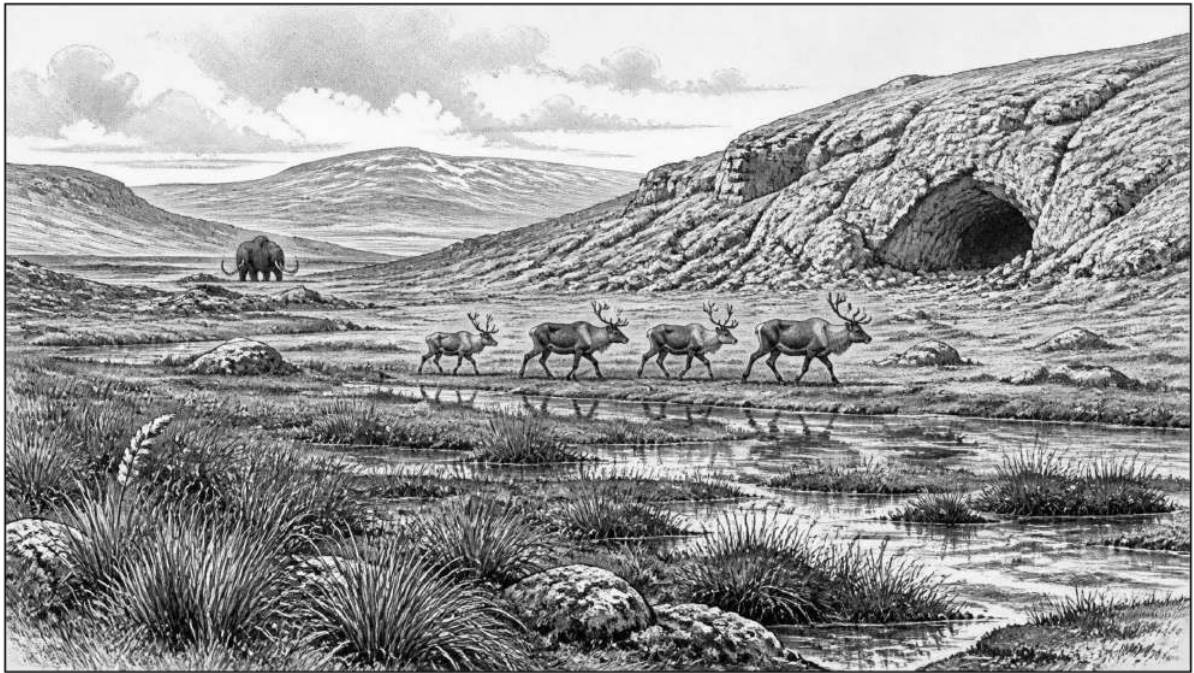
Economy and trade likewise cannot be reconstructed as institutions. There is no evidence for farming, herding, exchange goods, boats or markets in Ireland around this time. A more defensible subject is movement. Lower global sea levels altered the outlines of the Irish Sea region and expanded coastal plains, but an exposed landscape did not automatically create a simple, continuous land bridge. Local sea level, isostatic change, ice margins, rivers and water channels all mattered. The arrival of terrestrial animals demonstrates ecological connections with Britain and the wider north-west European zone at intervals; it does not determine the route, season or ease of every crossing.

The central development around this notional year was therefore environmental, not political. Derryvree records freshwater and treeless cold-country vegetation before renewed ice advance. Castlepook records a richer, time-layered animal archive from southern Ireland and preserves the unresolved possibility that people briefly entered this world. Subsequent expansion of the ice sheet would erase, bury and rearrange much of the physical evidence, helping to explain why the record is so fragmentary. Ireland at 31,648 BCE can be known as a changing Ice Age landscape of wetlands, open ground, mobile fauna and uncertain human traces—not yet as a settled human society.

Chapter 054 of 100

31647 BCE

Hyenahall's Mammoth Archive^[54]



31,647 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, equivalent to roughly 33,600 years before AD 1950, the conventional origin of “BP” dating. No excavated Irish layer can identify a particular season, person or occurrence in this precise year. Radiocarbon measurements have laboratory margins of error and must be calibrated against changing atmospheric carbon; deposits also form over spans of time. The responsible approach is therefore to place this nominal date within broad, calibrated Late Pleistocene ranges, and to separate physical evidence from the interpretations built upon it.

Around this point Ireland belonged to Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age, before the fullest expansion of the last British–Irish Ice Sheet. The landmass of modern Ireland was not yet a nation, an island in its present form, or a landscape of fields, roads and woodland. It was a changing north-west European glacial frontier. The essential story is environmental: cold, open habitats existed in places; large mammals reached them; and later ice growth would bury, scour and rearrange much of the evidence.

An Interval, Not a Date

It is tempting to turn a numbered BCE year into a scene with an exact temperature, coastline or migration route. The evidence does not allow that. The closest useful chronological framework comes from stratigraphy, radiocarbon dating, palaeobotany, animal bones and the study of glacial landforms. These sources describe windows of time rather than annual entries. In Ireland, even the best surviving MIS 3 archives are fragmentary: deposits were later overridden by ice, shifted by water, or recovered in early excavations whose recording standards fall far below those expected today.

The nominal date falls within a wider cold-stage phase conventionally called the Middle Midlandian in Irish Quaternary studies. It preceded the Last Glacial Maximum, generally placed at roughly 26,000–19,000 years ago, when ice was at its greatest extent. The precise onset, thickness and limits of Irish ice remain subjects of active research, but large dating programmes and coastal, offshore and upland evidence agree that the ice sheet expanded substantially after the period considered here. In other words, the Ireland of about 33,600 calibrated years BP was not simply “under ice”; it contained at least some non-glacial landscapes, though these were vulnerable to a major climatic deterioration.

Freshwater Beneath a Drumlin

The most valuable northern record lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed organic-rich freshwater silts and fine sands between two distinct layers of till, sediment left by glacier ice. This sequence gives a simple but powerful relative history: an earlier glaciation, then an ice-free interval with freshwater sediment accumulating, followed by renewed glaciation that sealed the deposit beneath the upper till.

A conventional radiocarbon determination from the Derryvree organic series was approximately 30,500 radiocarbon years BP, with a large uncertainty. Published calibrations place its likely age broadly at about 36,900–31,700 calibrated years BP. Thus 31,647 BCE falls within the outer range of the archive, but it cannot be treated as the date of the freshwater pool or any organism found in it. Nearby Fermanagh sites, including Greenagho and Hollymount, likewise show that cold, non-glacial conditions occurred in parts of the region during the Middle Midlandian, although their dates and correlations demand caution.

Derryvree’s biological remains indicate open ground rather than a wooded Ireland. Freshwater mosses, sedges, pollen, plant macrofossils and insects with northern or Arctic affinities point towards a tundra or muskeg-like setting: wet hollows and shallow water bordered by low vegetation, set amid exposed terrain. Grasses, herbs, sedges, mosses and low shrubs could exploit brief growing seasons; seasonally frozen ground, wind and poor soils restricted more luxuriant vegetation. A few traces of tree pollen cannot by themselves demonstrate a local forest, because pollen may travel long distances or be redeposited. The evidence supports a patchy, cold and locally wet environment, not an unbroken snowy waste and not the green temperate island familiar today.

This matters for everyday life in the broad ecological sense. Water margins would have concentrated plant growth and attracted animals, while dry ridges, gravelly slopes and frozen ground offered different routes and hazards. Yet Derryvree is a local archive, not a weather station for all Ireland. Conditions on the limestone lowlands of Cork, Atlantic-facing uplands or eastern plains may have differed in snowfall, exposure and vegetation. The record establishes environmental possibility, not a complete map.

Castlepook’s Cave Fauna

For animal life, Castlepook Cave near Doneraile in north County Cork is indispensable. Known also as Mammoth Cave, its narrow galleries and chambers include Hyenahall and Elephant Hall. Excavations from the early twentieth century onwards produced more than 2,000 bones. Geological Survey Ireland describes it as Ireland’s richest vertebrate archive for the period leading up to the Last Glacial Maximum, with dated individual remains extending broadly from about 45,700 to 19,950 years BP.

The assemblage includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, with wolf, Arctic fox, mountain hare and lemmings also represented in Ice Age deposits. These are direct evidence that such animals occupied, or in some cases were transported into, Irish cave systems during

portions of the Late Pleistocene. They make clear that Ireland was connected ecologically to the wider north-west European world. Low sea levels exposed substantial areas of the surrounding shelf, and modelling indicates that land connections between Ireland, Britain and continental Europe existed during parts of the glacial period. But lower seas do not prove a broad, stable, dry route at this particular moment: ice margins, rivers, glacial lakes and unstable ground mattered as much as a lowered shoreline.

The cave should not, however, be read as a single animal census for 31,647 BCE. Its deposits accumulated over many millennia. Carnivores dragged prey into cavities; water disturbed parts of the sequence; and antiquarian excavators recovered material from deposits whose original relationships were not always securely recorded. A hyaena bone or mammoth bone proves neither that every listed species was alive together nor that the cave was a human camp. Castlepook is a long-term repository, not a photograph of one day.

The Reindeer Femur Question

One Castlepook object has particular historical importance: a reindeer femur reported to bear a deep mark consistent with processing by a sharp stone tool. In 2021, zooarchaeologist Ruth Carden publicised a radiocarbon result of about 33,000 years for this bone and interpreted the mark as possible evidence that Upper Palaeolithic people butchered reindeer in Ireland. If confirmed, it would extend evidence for human activity in Ireland very far beyond the securely dated terminal-Pleistocene butchered brown-bear bone from Alice and Gwendoline Cave, County Clare, dated to around 12,810–12,590 calibrated BP.

That conditional language is essential. The Castlepook specimen came from an old collection rather than a newly excavated, intact occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, human remains, repeated food waste or art of comparable age has been recovered there. Earlier dating of southern Irish cave fauna has also been reassessed as analytical methods improved, demonstrating why legacy results must be revisited rather than repeated uncritically. The femur may preserve an extraordinarily early human encounter with a reindeer; it does not establish a permanent population, a settlement at Castlepook, or continuous occupation of Ireland.

No Polity, No Proven Community

Accordingly, political affairs, diplomacy and organised warfare cannot responsibly be supplied for this year. There are no names, leaders, territories, tribal institutions, fortifications or weapons securely tied to this horizon in Ireland. “Ireland” is used here only as a convenient geographical term for the modern island, not as a state or cultural unit. Nor is there evidence for farming, villages, domestic animals, crops, formal trade, pottery, monuments, writing, schools or a developed religious institution. Such things belong to much later chapters of Irish prehistory.

If people did briefly reach the land, they were mobile hunter-gatherers, not an identifiable Irish society. The possible processing of one reindeer would speak to subsistence: meat, marrow, hide, sinew and bone could all have been valuable. It would not demonstrate trade or a routine seasonal economy. Likewise, caves may have provided shelter or landmarks to people, but at Castlepook the evidence much more securely attests animal and carnivore activity. Beliefs, language, kinship and ritual remain wholly beyond recovery. Silence here is not a deficiency to be filled by analogy with later Celtic, medieval or modern Ireland; it is the central fact.

Before the Ice Advanced

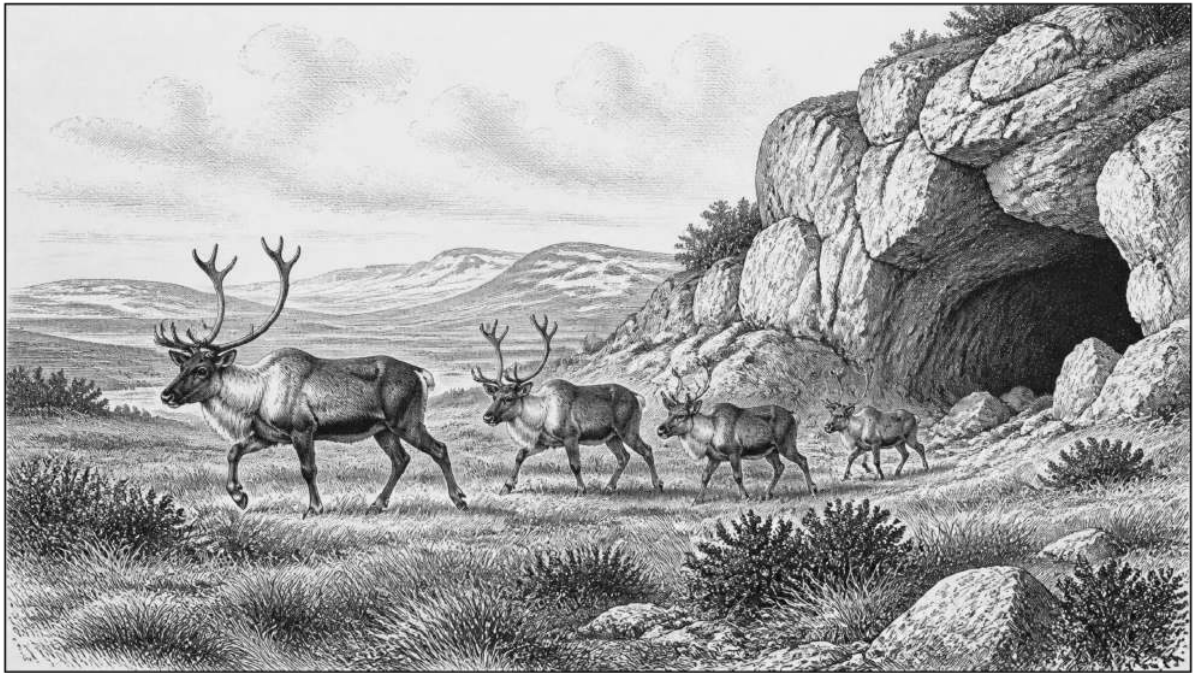
The lasting significance of this remote horizon lies in its precariousness. Sediments under a Fermanagh drumlin show cold freshwater habitats and open vegetation before renewed ice cover. Bones from a Cork limestone cave reveal a varied fauna adapted to, or capable of using, the exposed western edge of Late Pleistocene Europe. The disputed reindeer femur raises the possibility—no more than that at present—of a human presence within that world.

Subsequent ice-sheet growth transformed the stage, eroding older surfaces and enclosing fragments of biological evidence beneath till. That destructive history explains why the record is so thin. Around 31,647 BCE, the most defensible picture is neither an empty land nor a settled homeland: it is a fluctuating cold landscape, biologically active in places, whose mammals and waterlogged sediments survive as rare witnesses to an Ireland before the maximum ice advance.

Chapter 055 of 100

31646 BCE

Castlepook's Single Cut^[55]



31,646 BCE is not a date that can be assigned to an event in Ireland. It is a modern, backwards-counted calendar label, useful only as an approximate point on a much broader prehistoric timescale. In archaeological terms it falls about 33,600 calendar years before present, conventionally measured from 1950, during the Late Pleistocene and Marine Isotope Stage 3. At this depth of time, neither documentary history nor annual chronology exists. Radiocarbon determinations carry statistical uncertainty, and their conversion into calendar years depends on calibration curves that are themselves refined as evidence improves. The responsible question, therefore, is not what happened in Ireland in this particular year, but what the surviving geological and animal evidence can tell us about conditions in and around Ireland during the several millennia surrounding it.

A Landscape Before the Last Maximum

This was an Ice Age world, but not necessarily a vision of unbroken ice from coast to coast. The greatest expansion of the last British–Irish Ice Sheet came later, broadly between about 26,000 and 19,000 years ago. Research on mountain trimlines and glacial landforms indicates that parts of north-central Ireland remained ice-free until at least about 34,000 years ago, close to the chronological horizon represented by 31,646 BCE. That does not establish that every district was open country, nor does it provide a map for one exact year. It does show why Ireland should not be imagined simply as an empty white cap before the Last Glacial Maximum.

Climate in Marine Isotope Stage 3 was unstable. Greenland ice-core records reveal repeated swings between colder stadials and relatively milder interstadials, sometimes abrupt on geological timescales. Ireland lay on the Atlantic margin of that changing North Atlantic system. Conditions around 33,600 years ago may have supported a patchwork of grassland, herb-rich open ground, sedge wetlands, exposed

mineral soils and sheltered valley habitats, rather than woodland comparable with modern Ireland. Local conditions depended on altitude, drainage, latitude and the proximity of ice. Later glacial erosion removed or reworked much of the evidence, so caves, protected sediment pockets and buried deposits carry disproportionate importance.

Sea levels were substantially lower than today as water was held in northern ice sheets, changing the outlines of coasts and exposing areas now beneath the sea. Yet the exact routes between Ireland, Britain and continental Europe remain uncertain. Lower sea level did not automatically produce one broad, permanent land bridge. Models of changing relative sea level, ice cover and isostatic movement offer differing reconstructions. The presence of large mammals in Ireland proves that dispersal was possible at particular times; it does not by itself reveal whether animals crossed dry ground, ice, narrow water barriers, or a changing combination of these. That uncertainty matters equally for any possible human movement.

The Castlepook Archive

The most suggestive evidence relevant to this period comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations there from the late nineteenth and early twentieth centuries recovered a remarkable concentration of Pleistocene animal remains. The National Museum of Ireland's collections include material from the cave, among it a spotted hyena skull. Castlepook has yielded evidence for a formidable animal community: woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyena. These are not all proof of a single living community seen on one afternoon, or even in one century. A cave deposit can collect bones over long periods, and animals, water, gravity, excavation and later disturbance can mix material of different ages.

That warning is particularly important at Castlepook. The Irish Quaternary Fauna Project used accelerator mass spectrometry to date selected bones from old collections and demonstrated that Irish cave faunas encompassed several chronological phases. Subsequent reassessment has shown that some southern Irish faunal evidence belongs to Marine Isotope Stage 3, well before the Last Glacial Maximum, while other remains are considerably later. A radiocarbon measurement dates the death of the sampled animal within a probability range; it does not date every bone from the same cave gallery, still less an entire landscape. Castlepook is consequently a powerful archive of Ice Age Ireland, but not a neatly sealed settlement layer.

One object gives this article its focus: a reindeer femur fragment from Castlepook, reported as dating to roughly 33,000 years ago and bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as a cut made by a sharp stone tool. County Cork's heritage record accordingly presents it as evidence that Stone Age hunters may have processed a reindeer in the region around c. 31,000 BCE. If that interpretation is sustained, it would represent extraordinarily early evidence of human activity in Ireland, long before the previously recognised terminal-Pleistocene traces and the far better attested Mesolithic settlement of the early Holocene.

Evidence, Not a Lost Settlement

The reindeer bone is important precisely because it is slight. It is not a house floor, hearth, burial, camp, weapon, stone-tool assemblage or group of securely associated butchered animals. No Palaeolithic settlement has been excavated at Castlepook, and no stone tool has been recovered in direct association

with this femur. Nor can the bone show whether the animal was hunted, scavenged after death, butchered elsewhere and its remains later dragged into the cave by carnivores. Hyenas are especially relevant: caves often served as their dens, and their feeding, gnawing and bone-transporting behaviour can create complex accumulations.

The distinction between observation and interpretation should therefore remain visible. The observed facts are a fossil reindeer bone, an ancient date attributed to it, and a surface modification. The interpretation is that the mark is anthropogenic and records butchery by people using a stone edge. This is plausible enough to justify renewed investigation and to change the questions asked of Irish Palaeolithic archaeology. It is not enough to populate the landscape with a known tribe, name a migration, or claim a continuous Irish population from the Upper Palaeolithic onwards. Further fieldwork at Castlepook has also underlined how thoroughly earlier excavations emptied or disturbed many cave deposits, making fresh contextual discoveries difficult.

For this reason, the safest description of people in Ireland around 31,646 BCE is conditional. Small, mobile Upper Palaeolithic groups may have entered the region seasonally, perhaps following animal movements and exploiting a brief window of habitable terrain. They would have belonged to the wider world of *Homo sapiens* already present in parts of north-west Europe. But Ireland supplies no secure evidence for their numbers, sex and age composition, language, kinship system, routes, duration of stay or eventual fate. It is equally possible that visits were rare and discontinuous. A single possible butchery trace must not be inflated into a settled society.

Food, Movement and Everyday Risk

If people did process the Castlepook reindeer, the practical context was demanding. Reindeer offered meat, marrow, fat, hide, sinew, antler and bone: a large return for a mobile hunting party equipped to cut and carry portions away. Such a task required knowledge of animal anatomy, sharp-edged tools and decisions about transport, preservation and danger. Yet those general possibilities come from wider Upper Palaeolithic comparisons, not from a reconstructed Castlepook meal. Ireland has supplied no contemporary cooking place, hide-working area or toolkit from which to infer a local daily routine in detail.

Predators made carcasses contested resources. Spotted hyenas, wolves and bears were not symbols in a story but active competitors and scavengers; their remains and tooth marks help explain why caves can preserve bones while also complicating their interpretation. Mammoths and giant deer indicate that at least some Irish landscapes could support large grazing or browsing mammals during earlier cold-stage intervals. Reindeer and small cold-adapted mammals point towards open, often harsh conditions. The precise overlap of each species around 31,646 BCE cannot be assumed, but together they reject the old picture of a biologically vacant Ireland before the final ice advance.

There is no recoverable political history here. No chieftdom, territory, alliance, war, diplomacy, law or named community can responsibly be identified. Nor is there evidence for formal religion, monuments, art or teaching in Ireland at this date. If visitors came, they undoubtedly possessed learned skills and social traditions, but their beliefs and cultural practices have left no secure Irish trace. The most defensible cultural statement is negative but significant: the possible cut mark suggests technical knowledge carried into Ireland from a wider human world, while the absence of associated artefacts prevents closer identification.

A Fragile Northern Frontier

At this horizon Ireland was not the familiar island of farms, forests, parishes or kingdoms. It was a changing northern frontier in which open habitats, fluctuating ice margins, altered coastlines and animal dispersals shaped every possibility of movement. Castlepook's bones offer direct testimony that such a landscape supported Pleistocene fauna. The reindeer femur may add the first faint testimony of people. Its value lies not in supplying certainty where none exists, but in making Ireland's deep past less empty, more connected to neighbouring Ice Age Europe, and more open to careful future discovery.

Chapter 056 of 100

31645 BCE

Castlepook's Carnivore Galleries^[56]



There can be no responsible chronicle for a single calendar year this far back. “31,645 BCE” is a modern numerical label, not a date that people in prehistoric Ireland could have recognised, and the evidence cannot distinguish one year from the next. In radiocarbon and calibrated-calendar terms it points broadly to about 33,600 years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a climatically unstable phase of the Late Pleistocene. Individual Irish finds are dated with ranges and uncertainties; the historical task is therefore to describe the landscapes and possible activity illuminated by those ranges, rather than to invent an event for this notional year.

An Island in a Changing Ice Age

Ireland at this broad horizon was neither the familiar green, wooded island of later millennia nor necessarily a single uniform wilderness. It lay within the northern European Ice Age world, at a point when the British–Irish Ice Sheet was building towards its later maximum. A major review assigns the ice-sheet build-up to after roughly 35,000–32,000 years ago, with its maximum extent later, about 27,000–21,000 years ago. More recent reconstruction likewise places peak ice volume around 23,000 years ago. Thus 31,645 BCE belongs to an earlier, changing stage: some landscapes could support cold-adapted life, while advancing ice was already a decisive force in the region’s future.

It would be misleading to imagine that every part of Ireland was simultaneously ice-free, or that conditions in Cork, Fermanagh and the offshore shelf were identical. Ice margins shifted, uplands and basins responded differently, and later glaciers scoured away much of the evidence. The Last Glacial Maximum eventually covered most of Ireland and extended across the western continental shelf, but that

later expansion must not be projected wholesale on to the earlier MIS 3 landscape. The patchy survival of old caves, buried sediments and fossil bone is itself part of the story: most potential campsites and open landscapes have either been destroyed, buried or remain undiscovered.

Derryvree's Buried Wetland

The clearest environmental evidence relevant to this deep period comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks exposed freshwater silts and fine sands caught between two tills, the unsorted sediments laid down by glacial ice. The sequence proves that, before a later ice advance sealed the locality, water and vegetation occupied a low basin. Organic material produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty of +1,170/–1,030 years. That is a radiocarbon measurement, not a calendar date; calibration is essential, and cannot truthfully yield a precise year in the thirty-second millennium BCE.

The Derryvree fossils support an interpretation of cold, open and largely treeless ground. Pollen was poorly preserved but predominantly herbaceous; plant macrofossils, mosses and insects add detail. Researchers describe a tundra or muskeg-like environment: wet, mossy or sedgy ground, shallow freshwater, frost-affected soils and a short growing season. Macrofossils include mountain avens (*Dryas octopetala*), an Arctic-alpine plant now most familiar in Ireland from limestone country in the west. This does not mean that Derryvree was a modern Arctic landscape transplanted intact to Fermanagh, nor that its precise plant community covered the whole island. It is firm local evidence for an open periglacial habitat during a broad cold-stage interval.

Such a setting had no fields, hedges, farms or villages. There is no evidence for cultivation, livestock, pottery, metalwork, built houses, monuments or territorial boundaries. Rivers and seasonal pools, exposed mineral ground, marshy vegetation and the shelter offered by relief would have mattered more than any political geography. The outlines of modern counties, provinces and coastlines are irrelevant to the period, although the site names used by archaeologists help locate the surviving evidence.

Castlepook's Animal World

In north County Cork, Castlepook Cave near Doneraile—also known as Mammoth Cave—preserves Ireland's richest known pre-Last Glacial Maximum vertebrate collection. Its limestone passages yielded remains of woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. The assemblage demonstrates that Ireland was reached, at intervals, by a striking range of large mammals and cold-adapted smaller animals during the Late Pleistocene. Improved collagen pretreatment and radiocarbon dating have been especially important: re-dating showed that several Castlepook specimens were thousands of radiocarbon years older than earlier determinations suggested, strengthening the evidence for an MIS 3 fauna.

These bones should not be read as a census from one day, one herd or even one generation. Castlepook accumulated material over long periods. Carnivores carried prey or scavenged carcasses into caves; water, sediment movement and earlier excavation disturbed deposits; species represented in adjacent galleries may be separated by millennia. A spotted-hyaena skull from the cave, now in the National Museum of Ireland, is an especially vivid reminder that caves were part of a predator and scavenger landscape as well as a potential refuge for animals. The word “hyaena” here denotes the Ice Age spotted hyaena, not an exotic visitor imagined from modern Africa.

Reindeer are particularly important for a reconstruction near 31,645 BCE. They favour open, cold environments and their remains accord with the Fermanagh evidence for tundra-like vegetation, although the two sites cannot be collapsed into a single simultaneous scene. Mammoth and giant deer attest to an ecological world capable, during favourable intervals, of supporting very large herbivores. Predators, scavengers and small mammals occupied different niches within it. What can be said securely is that Ireland was not biologically empty before the Last Glacial Maximum. What cannot be established is the size, permanence or exact distribution of each population across the island.

The Reindeer Femur Question

Castlepook also carries an arresting, but limited, possible human story. A reindeer femur from the cave collection has been presented as dating to about 31,000 BCE and bearing a single incision interpreted by Ruth Carden as a cut made by a sharp stone tool while fresh bone was being processed. County Cork's heritage record appropriately treats it as a potentially momentous Palaeolithic artefact: if the interpretation is correct, it indicates that people handled a reindeer in Ireland far earlier than the island's formerly accepted evidence for human presence.

Potentially is the crucial word. The bone was recovered from an old cave excavation, not a modernly excavated, sealed occupation floor. No securely associated stone tools, hearth, dwelling, human remains or butchery area of equivalent age has yet been recovered there. The date of a bone establishes when the animal died, within the range generated by the laboratory and calibration process; it does not itself prove when a mark was made, who made it, or where the carcass was killed. A carnivore could have transported the already marked bone into the cave. The prudent conclusion for 31,645 BCE is therefore not that Ireland possessed a settled human population, but that one specimen offers a serious hypothesis of transient human activity that requires further testing.

People Without a Proven Settlement

If people did visit Ireland during this interval, comparison with contemporary Upper Palaeolithic groups elsewhere in north-west Europe suggests mobile hunter-foragers, moving through seasonal landscapes and dependent on close knowledge of animals, weather, stone and shelter. That comparison is an interpretation, not direct Irish evidence. There is no demonstrated Irish camp, social group, language, leader or route of arrival from which to reconstruct a local society. Nor does lower global sea level automatically prove a usable land bridge between Britain and Ireland: ice loading, crustal movement, local sea levels and changing marine channels complicate the geography. Animal presence shows that movement into Ireland occurred, but not how often, by which exact corridor, or whether people followed the same paths.

Accordingly, there are no political affairs, diplomacy or warfare to narrate. There is no evidence for Irish ritual, formal burial, cave art, education or trade at this date. Stone tools may have been used if the Castlepook cut-mark interpretation proves sound, but no tool assemblage allows archaeologists to identify a technology or exchange network. It is more truthful to leave those categories blank than to give this remote period a borrowed version of later prehistoric Ireland.

A Threshold, Not an Origin Story

The importance of this horizon lies in its challenge to easy assumptions. Ireland was not merely a blank land waiting for the first Holocene settlers. Its caves and buried wetland deposits preserve a dynamic Late Pleistocene world of freshwater basins, sparse tundra vegetation, reindeer, mammoth, giant deer and dangerous carnivores. Yet neither is it possible to claim an established Ice Age nation or a continuous population. The later expansion of the ice sheet would remodel the island and erase much evidence, while the earliest unequivocal archaeological traces of sustained human settlement belong much later.

For this notional year, then, the most historically significant development is environmental: Ireland stood in a fluctuating cold-stage interval before the great glacial maximum. Derryvree shows open, frost-influenced wetland in Fermanagh; Castlepook demonstrates a rich Cork fauna and preserves a provocative possible trace of butchery. Together they offer not an annal for 31,645 BCE, but a disciplined portrait of what evidence can—and cannot—say about Ireland roughly 33,600 years ago.

Chapter 057 of 100

31644 BCE

Maguirebridge's Calibrated Tundra^[57]



31,644 BCE cannot be treated as an anniversary. No written calendar, named ruler, excavated settlement or securely dated human episode permits history at the scale of a modern year. In archaeological usage, the date corresponds roughly to 33,594 calibrated years before present (cal BP), with “present” defined as 1950. It falls in the later part of Marine Isotope Stage 3, a climatically volatile interval of the last Ice Age. The responsible approach is to examine evidence whose calibrated ranges overlap this horizon, rather than invent an event for it. The key Irish record lies beneath a drumlin near Maguiresbridge, County Fermanagh.

A Date Within a Range

The principal chronological anchor is the Derryvree freshwater deposit, exposed during roadworks in 1969 about two kilometres north-east of Maguiresbridge. Silts and fine sands containing organic material lay between two substantial sheets of till, deposits made by ice. The original radiocarbon determination, Birm-166, was 30,500 radiocarbon years BP and carried a large uncertainty. Recalibration places the material broadly at about 36,900–31,700 cal BP. That interval includes the nominal year considered here. It shows that this part of Fermanagh was ice-free at some point within that span, but cannot establish precisely what occurred there in 31,644 BCE. The range, rather than the numbered year, is the historical fact.

Derryvree is valuable because it preserves environmental evidence in its geological setting, but it also warns against false precision. A radiocarbon age is not identical to a calendar age: atmospheric carbon-14 levels changed over time, requiring measurements to be calibrated against independently dated archives. At this depth in time, calibrated intervals remain broad and may be refined as methods improve. The

deposit records conditions during sediment formation and accumulation, not a complete annual diary of the locality. It is evidence for a cold-stage landscape over centuries or millennia, not an event on a particular day.

Open Ground in Fermanagh

Plant and animal remains from Derryvree indicate a treeless, periglacial environment. Recorded pollen was largely herbaceous, while plant macrofossils included mosses and species associated with cold, wet ground. The assemblage has been interpreted as tundra or muskeg-like vegetation beside freshwater. This was not the familiar green, wooded Ireland of later millennia. Dry ground may have carried sparse herb-rich cover, while shallow pools, wet hollows and sedge-rich margins punctuated a landscape exposed to frost, wind and strong seasonal contrasts. Such reconstruction remains interpretive, but it is closely constrained by the botanical evidence.

The landscape was not, however, a blank sheet of ice. Ireland was probably largely ice-free until roughly 32,000 cal BP, although expansion of the last Irish Ice Sheet was approaching and varied by region. The later Last Glacial Maximum, conventionally dated to about 26,500–19,000 years ago, would cover almost all of the island and profoundly rework older surfaces. At the horizon represented by Derryvree, local freshwater and vegetation records coexist with the larger story of deteriorating climate and advancing ice. Subsequent glaciation helps explain why evidence from this era is so sparse: it eroded, buried, mixed or removed many places where people and animals might once have left traces.

Caves and a Lost Fauna

In southern Ireland, Castlepook Cave near Doneraile in north County Cork provides a different archive. Early twentieth-century excavations recovered an extraordinary collection of Ice Age animal remains, including reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. Later radiocarbon programmes established that the cave material accumulated during more than one period. The cave is therefore not a frozen moment, and its fauna should not be imagined as a single herd, pack and hunting party sharing one valley. Yet the collection securely shows that, during the broader MIS 3 interval, Ireland supported or was reached by a richer cold-climate mammal community than the modern island.

The distinction between a cave assemblage and a living landscape is important. Animals may have died in natural traps; carnivores may have dragged carcass parts underground; water may have moved bones; and early excavations disturbed deposits whose layers were not always recorded to modern standards. The Irish Quaternary Fauna Project noted extensive re-sorting at Castlepook and limits in its stratigraphy. More recent work has also shown that several older bone dates need revision because improved collagen pretreatment and ultrafiltration can remove contaminants that make samples appear too young. The strongest conclusion is not that every listed species lived together in 31,644 BCE, but that cold-adapted and open-country fauna repeatedly reached Ireland in the relevant prehistoric world.

The Human Question

The possibility of people in Ireland at this time rests chiefly on one controversial but important object: a reindeer femur from Castlepook that County Cork heritage interpretation presents as bearing a mark consistent with cutting fresh tissue using a sharp stone tool. It has been associated broadly with about

31,000 BCE. If the mark is anthropogenic and its association secure, it may indicate that one or more Upper Palaeolithic hunters processed a reindeer in Ireland during the wider Ice Age period. It would be a remarkable clue, not proof of a permanent colony. No securely associated hearth, stone-tool assemblage, dwelling, burial, art panel or repeated occupation floor has established an Irish community of this age.

Caution is essential because the National Museum of Ireland still describes the Palaeolithic human record as lacking clear evidence, apart from a much older flint flake at Mell, County Louth, thought to have been transported to Ireland by ice rather than made or used there. The cave femur merits continued scrutiny precisely because it challenges that conservative position. A current Castlepook research project has sought surviving undisturbed deposits and reassessed old collections. Until it produces a securely contextualised human artefact or repeated evidence of activity, the responsible conclusion is that transient human presence is possible, perhaps even plausible, but permanent settlement is unproven.

For comparison, the better-published cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, is vastly later, dating to about 12,890–12,678 cal BP. Its two independent dates and microscopic assessment support the claim for a Late Upper Palaeolithic human visit. That find cannot be projected backwards more than twenty millennia to fill the silence at Derrynvree or Castlepook. It does demonstrate the kind of evidence required: a directly dated bone, plausible cut marks, careful analysis and transparent publication. It also shows how Irish prehistory changes when neglected museum collections are revisited with improved methods.

Society Without a Settlement

If people entered Ireland around this horizon, the available evidence favours a very small, mobile party rather than a settled population. Reindeer, if locally available, would have supplied meat, fat, hide, sinew, antler and bone; other large herbivores could have offered similar resources. But this is an inference from animal ecology and wider Upper Palaeolithic practice, not direct evidence for a Castlepook camp. There is no basis for naming a tribe, assigning a language, reconstructing families or attaching visitors to a particular continental archaeological culture. Nor can an isolated animal-processing trace establish whether hunters arrived across exposed coastal plains, narrow water, or another route through a changing Irish Sea world.

Political affairs, warfare and diplomacy are beyond recovery. No states, kingdoms, borders, written agreements or named leaders are evidenced in Ireland. It would be misleading even to call a possible hunting party “Irish” in any later cultural sense. At most, social organisation may have involved the flexible co-operation needed for travel, hunting, carcass processing and survival in a demanding seasonal environment. Relations with groups in Britain or continental Europe remain unknown. The evidence permits mobility and contact as possibilities; it does not document routes, alliances, conflict or exchange networks.

Culture, Religion and Learning

No locally proven object supports claims about ritual, religion, art, music or formal learning in Ireland at this date. Upper Palaeolithic groups elsewhere in Europe made sophisticated blades, ornaments, figurative art and cave images, but Ireland has yielded no securely dated equivalent from this interval. Decorating an Irish Ice Age scene with continental art traditions or elaborate ceremonies would substitute

analogy for evidence. The strongest cultural conclusion is more modest: whoever made a possible cut mark would have possessed practical knowledge of sharp-edged stone technology and animal anatomy. Even that depends on confirmation that the mark was made by a human.

Knowledge of the country was nevertheless embedded in the ecological record. Mammals capable of reaching Ireland, and any people who may have followed them, would have responded to terrain, weather, forage, water and seasonal opportunity. Derryvree's wetland plants and Castlepook's fauna reveal a landscape in which survival depended on reading those conditions. This was not an economy of fields, livestock, markets or imported goods, but a world of wild resources and precarious access. No evidence identifies trade in objects, though movement itself would have connected Ireland's changing landmass to the wider north-west European Ice Age environment.

An Environmental, Not National, History

The central development around 31,644 BCE was environmental change. Within the calibrated span containing this nominal year, Fermanagh preserved freshwater sediments beneath open tundra; southern caves retained bones from animals adapted to a cold, largely treeless world; and Ireland was moving toward severe glaciation that would later overwhelm or transform much of the land. Crag Cave speleothem research in south-west Ireland independently indicates that last-glacial climates oscillated sharply, with interstadial conditions mild enough for liquid water and calcite growth alternating with colder phases. Ireland was not environmentally static, even where evidence cannot be narrowed to one year.

That is the appropriate history for this date: not an invented chief, battle or village, but a carefully bounded picture of a changing Ice Age landscape. Derryvree provides the clearest chronological window, Castlepook the most vivid faunal evidence, and the debated reindeer femur keeps open the question of very early human visitation. Together they describe an Ireland intermittently habitable for cold-adapted animals, perhaps briefly visited by hunters, and on the threshold of much more extensive ice. The uncertainty is not a defect to conceal. It is the defining feature of Ireland's deep past, and the reason every surviving silt layer, bone and cave deposit matters.

Chapter 058 of 100

31643 BCE

Derryvree's Bogbean Waters^[58]



The label 31,643 BCE is a modern chronological convenience, not a date that can be identified in Ireland's prehistoric record. No one living then used this calendar, and neither radiocarbon dating nor glacial deposits can isolate a particular Irish event, person or season in a single year nearly 34,000 years ago. In calendar terms it is approximately 33,592 years before AD 1950. The responsible historical frame is the later part of the Last Glacial period, within Marine Isotope Stage 3, and it must be measured in broad intervals rather than annual entries.

On the Greenland ice-core chronology, that nominal point falls within Greenland Interstadial 6, a short milder pulse conventionally placed at about 33.69–33.31 thousand calendar years before present. This does not mean that Ireland shared Greenland's weather day for day, or that an Irish deposit can be assigned exactly to the interval. It does show that the North Atlantic climate system was capable of rapid, large changes. The dating uncertainty attached to the Irish evidence is wider than the 380-year duration of that named interstadial.

A Landscape Between Ice Advances

Ireland was not yet in the fullest grip of the Last Glacial Maximum, the phase when an ice sheet covered all or almost all of its low ground, conventionally around 26–21 thousand years ago. But this was no settled, benign interval before the ice. Research increasingly depicts the British–Irish Ice Sheet as an unstable system which had already grown and changed repeatedly during Marine Isotope Stage 3. Its limits, thickness and timing varied by region, while later ice advance destroyed, buried or rearranged much of the earlier terrestrial record.

Thus, it is not responsible to draw a single coastline, ice margin or vegetation boundary for all Ireland in 31,643 BCE. Sea level was substantially lower than today, so the modern island formed part of a wider, changing north-west European land-and-sea margin. Connections between Ireland, Britain and the exposed continental shelf could at times have facilitated the movement of land mammals, though routes were constrained by channels, coasts, ice and climate. The National Museum of Ireland summarises the broader evidence as indicating the arrival of spotted hyena and other mammals from Britain sometime around 45,000–30,000 years ago. That is a long chronological window, not evidence for a migration in this particular year.

The Derryvree Evidence

The most illuminating Irish environmental evidence relevant to this broad period comes from Derryvree, near Maguiresbridge in County Fermanagh. There, organic-rich freshwater sediments were discovered between two layers of glacial till beneath a drumlin. The lower till belongs to an earlier ice advance; the upper till records a later one. Between them survives a remarkable, if limited, record of a time when water, plants, insects and sediment accumulated in a local basin rather than being overridden by ice.

A conventional radiocarbon determination from the organic layers was 30,500 years BP, with an uncertainty of roughly a millennium. That is a radiocarbon age, not an unmediated calendar date: it requires calibration against changing atmospheric carbon-14, and its uncertainty creates a wide calendar interval. IntCal20 provides a Northern Hemisphere calibration curve to 55,000 calendar years BP, but calibration does not make Derryvree an annual diary. The deposit is best treated as evidence for conditions in a broad Middle Midlandian interval close in geological terms to the assigned date, not as proof of the landscape on 31,643 BCE itself.

What does survive is unusually vivid. Pollen, plant remains, freshwater mosses and sedges, together with insects of cold northern aspect, point to open tundra or tundra-like wetland, not a forested Ireland. A seed of bogbean, *Menyanthes trifoliata*, is especially revealing. It indicates shallow freshwater or wet margins capable of sustaining aquatic vegetation. Mosses, sedges and small pools would have formed a patchwork within a generally exposed periglacial setting: ground affected by severe seasonal freezing and thawing, but not necessarily covered by glacier ice at that locality when the deposits formed.

Open Ground, Not Empty Ground

Treeless does not mean lifeless. The Derryvree flora and insect fauna suggest cold, damp ground with vegetation sufficient to support small food webs. Elsewhere in Ireland, cave deposits provide the complementary evidence of larger animals. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, has produced remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyena. Many bones bear tooth damage, and the cave was used over time by carnivores, especially hyenas, rather than representing one tranquil animal community or one single moment.

These animals establish that parts of Ireland supported a cold-stage fauna during the long period before the Last Glacial Maximum. They should not, however, be assembled into a fictional tableau for 31,643 BCE. Castlepook's old excavations recovered material from disturbed and complex deposits.

Modern re-dating has shown that some earlier determinations underestimated the true ages of bones by approximately 5,000–12,000 radiocarbon years. Individual specimens therefore have their own dates and contexts, while the collection as a whole spans many millennia.

The calibrated dates demonstrate this caution clearly. One brown-bear specimen from Castlepook has published calibrated ranges of 38,041–34,320 and 39,416–37,153 cal BP, depending on the treatment of the determination; another directly dated Castlepook bone has a published range of 35,703–34,384 cal BP. Such ranges are invaluable for placing animals within Late Pleistocene Ireland, but they do not securely document those animals at the nominal 33,592 cal BP represented by this entry. Evidence and interpretation must remain separate.

People: A Possibility, Not a Population

The question of people is the most arresting and the most easily overstated. A reindeer femur from Castlepook has a deep incision that zooarchaeologist Ruth Carden has interpreted as a mark made during processing with a sharp stone implement. If that interpretation is upheld, it would indicate human activity in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for settlement after the last ice age. It would suggest a brief visit, hunt or carcass-processing episode by highly mobile hunter-gatherers moving through the wider north-west European zone.

But the bone does not demonstrate a permanent community, a village, a named people, or a population continuous with later inhabitants of Ireland. No securely associated hearth, dwelling floor, stone-tool assemblage or human remains from a contemporary, stratified Irish occupation has been recovered at Castlepook. Its old cave context is disturbed. Nor is the specimen an exact date for 31,643 BCE. The honest conclusion is narrower: human presence in pre-Last-Glacial-Maximum Ireland is a serious possibility supported by a potentially modified bone, but the scale, frequency and duration of such presence remain unresolved.

No Politics, No States, No Recorded Religion

There can be no account here of kingship, diplomacy, warfare, law or political boundaries. There were no recorded states in Ireland and no documentary archive. Equally, no evidence permits identification of religious rites, artistic traditions, spoken languages, kin groups or formal territories. If people did reach the island in this period, they would have relied on social knowledge, cooperation and mobility to survive in a dangerous environment, but that is an inference from the requirements of Upper Palaeolithic lifeways elsewhere, not a directly observed Irish institution.

Nor can economy and trade be described in their later senses. The relevant exchanges were ecological: the movement of animals, people and materials across a wider landscape periodically reshaped by sea, ice and climate. Reindeer and other herbivores could have offered meat, hide, sinew, bone, antler and fat to any visiting hunters; caves offered shelter and dens to carnivores. Yet the Irish evidence does not establish organised procurement, recurring trade routes or a local tool-making tradition at this date.

A Fragile Archive

The principal historical development around this notional year was therefore environmental instability. A brief North Atlantic warming pulse, local wetlands preserved beneath later glacial deposits, animal movements through a changing Irish Sea world, and the prospect of fleeting human visits are more

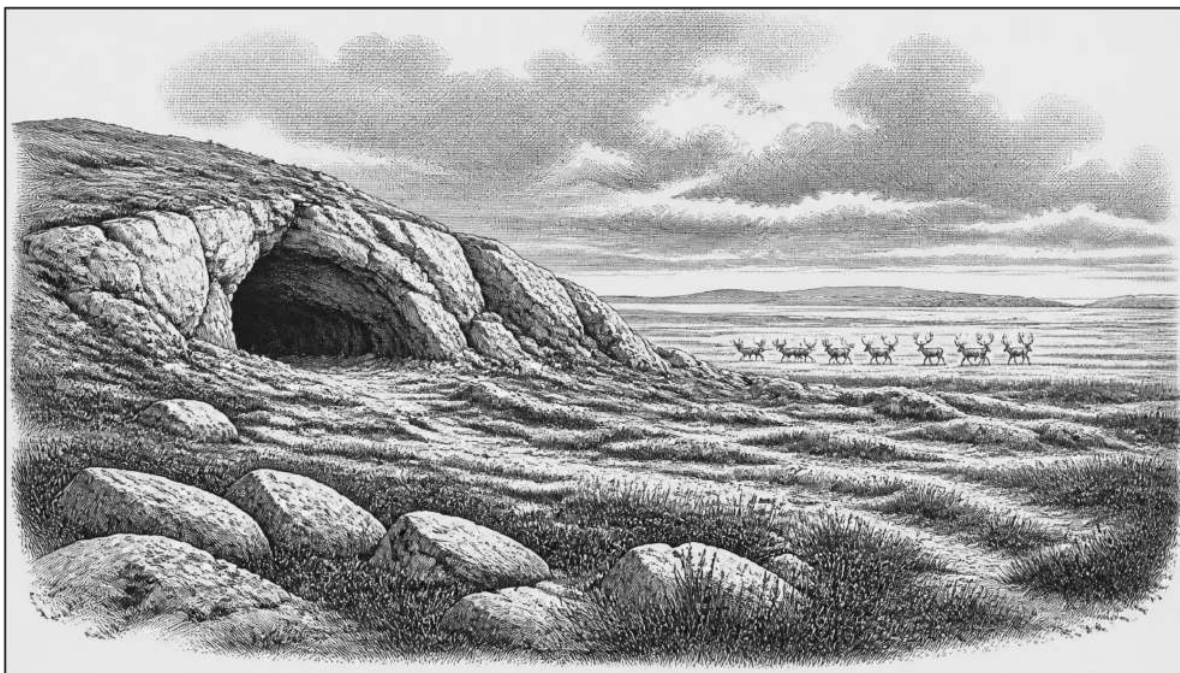
consequential than invented stories of settlement. Ireland's archive is sparse precisely because later ice sheets eroded and buried landscapes, while the evidence that survived often lay in caves or sealed sediment pockets.

Derryvree's bogbean waters matter because they prevent the Ice Age from becoming a blank white backdrop. They show that, during one broad interval between glacial advances, there were freshwater margins, mosses, sedges, insects and open ground in what is now County Fermanagh. Castlepook shows that a diverse cold-stage fauna reached Ireland at different times before the maximum ice advance. Together they offer a disciplined picture of 31,643 BCE: not a year with a recoverable event, but a point within a volatile prehistoric world whose traces must be read with precision, restraint and respect for uncertainty.

Chapter 059 of 100

31642 BCE

The Castlepook Femur Problem ^[59]



Modern calendar-year precision is not available for Ireland in 31,642 BCE. That label is a retrospective convenience, not a date recognised by anyone living at the time. It corresponds broadly to 33,591 years before AD 1950, but the appropriate chronological language is in calibrated ranges of centuries or millennia, not in individual years. Ireland lay in the Late Pleistocene, within Marine Isotope Stage 3, a highly unstable part of the last Ice Age. The evidence does not permit an annal of kings, settlements or battles. It instead offers a difficult, fragmentary view of changing ice, open country, animals and the possible movements of people.

A Landscape in Transition

At this depth of time, Ireland was not yet the familiar island of later prehistory. Global sea levels were substantially lower than today because vast quantities of water were stored in northern ice sheets. The Irish Sea basin and adjoining shelves exposed or narrowed routes that are now submerged, although precisely which passages were dry, marshy, coastal or blocked by ice varied through time. Ireland's relationship with Britain and north-western Europe therefore cannot be reduced to a simple "land bridge" story. Access may at times have been easier than in later millennia, but it was shaped by cold seas, shifting shorelines, ice margins and the capacity of animals or people to move through dangerous terrain.

The climate was severe by modern standards, but it was not uniformly frozen. Greenland ice-core records show that the later Ice Age was punctuated by abrupt cold stadials and comparatively milder interstadials. Those large North Atlantic shifts affected the weather, vegetation and ice accumulation around Ireland. The date represented by 31,642 BCE should therefore be understood as part of a

fluctuating environmental interval rather than as a stable climatic moment. A generation living during one phase could have encountered conditions markedly different from those known by people or animals several centuries earlier or later.

Research on the British–Irish Ice Sheet indicates that major growth was under way around the transition from Marine Isotope Stage 3 to Stage 2, but it also emphasises regional complexity. The full ice-sheet maximum came later, during the Last Glacial Maximum. Around this earlier period, some Irish areas may have supported expanding local ice masses, periglacial ground or open habitat, while others retained terrain usable by cold-adapted mammals. Subsequent ice advance, erosion and deposition destroyed or buried much of the evidence that might once have recorded those landscapes in greater detail.

Castlepook’s Deep Archive

The most important Irish evidence relevant to this distant period comes from Castlepook Cave near Doneraile in north County Cork. Formed in Carboniferous limestone, its narrow galleries and chambers trapped bones over a long span of the Ice Age. Early excavators gave evocative names to parts of the system, including Hyenahall, Elephant Hall and the Gallery of Aged Carnivores. These names are historical curiosities, but they also point to the extraordinary range of fossils recovered there.

Castlepook is Ireland’s richest known vertebrate archive for the period before the Last Glacial Maximum. More than 2,000 bones have been recovered, and radiocarbon results from individual specimens extend across a long interval rather than a single occupation or event. Modern re-dating has been especially important. Improved pretreatment of ancient bone showed that several older determinations had made parts of the Castlepook fauna appear thousands of radiocarbon years younger than they really were. The lesson is fundamental: a cave collection cannot be treated as one neatly sealed deposit, and one date cannot stand for the entire site.

For 31,642 BCE, Castlepook can responsibly illuminate a broad world of late Ice Age animal movement in southern Ireland, but it cannot confirm that every animal represented in the cave was alive in that exact year. Water disturbance, carnivore activity, nineteenth- and early twentieth-century excavation methods, and the mixing of deposits all limit certainty. The cave was a repository, not a photograph of one day’s landscape.

Mammoths, Reindeer and Hyenas

The Castlepook fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; younger parts of the record contain Arctic fox, wolf and two species of lemming. Such remains demonstrate that Ireland could support, or at least receive, a varied cold-stage fauna during the wider period. Mammoths and reindeer suggest extensive open ground with enough forage to sustain large herbivores. Giant deer, despite the popular name “Irish elk”, were not uniquely Irish; Ireland later became famous for its fossil finds, but the species ranged widely in Pleistocene Eurasia.

Spotted hyena is especially revealing. Castlepook is the only securely known Irish location for this predator, and the cave’s bone assemblage bears the marks of carnivore collection and feeding. Hyenas can carry prey parts into dens, gnaw bones and mix material of different origins. Their presence does not prove that every mammoth or deer bone was hunted in the immediate vicinity; some may have been scavenged or transported. Yet it does show that north Cork was linked to a continental-scale ecological world in which large predators, scavengers and herd animals could move through open terrain.

The absences matter as well. The Irish late Pleistocene record is far poorer than equivalent mainland British assemblages, and particular animals common elsewhere are absent or uncertain in Ireland. This may reflect genuine ecological limits, barriers to colonisation or the accidents of fossil preservation and discovery. Archaeology cannot safely convert such absences into a complete species list for a single year.

The Reindeer Femur Question

A reindeer femur from Castlepook has given this period unusual importance in the history of Irish archaeology. The bone has been publicly presented as dating broadly to about 31,000 BCE and bears a deep mark interpreted by zooarchaeologist Ruth Carden as a cut or chop made by a sharp stone implement during carcass processing. If that interpretation is confirmed, it would be possible evidence that people handled a reindeer in Ireland during the late Ice Age, much earlier than the well-established terminal Palaeolithic evidence from Alice and Gwendoline Cave in County Clare.

But the distinction between material evidence and interpretation must remain clear. The femur is real; its broad antiquity is directly relevant; and the mark deserves close specialist study. Yet it came from an old cave collection, not from a modern excavation of an intact occupation floor. No securely associated hearth, lithic assemblage, dwelling, burial, repeated processing area or human remains of comparable age has been identified at Castlepook. The radiocarbon age dates the animal's death, not automatically the moment of marking, the place where it was killed, or the length of any human visit.

It is therefore not responsible to write of a settled population, a named Irish Upper Palaeolithic culture, or continuous descent from supposed visitors at Castlepook to later inhabitants. Nor can a single possible butchery mark establish political communities, territories, diplomacy, warfare or trade. The National Museum of Ireland still rightly stresses the long-standing difficulty of demonstrating a clear Palaeolithic human presence on the island. Castlepook may alter that conclusion, but the case requires publication, replication and securely excavated context.

Human Possibility, Human Silence

If people did reach Ireland around this broad period, they were likely to have been highly mobile hunter-gatherers using a landscape that offered seasonal opportunities and severe hazards. Across north-western Europe, Upper Palaeolithic groups possessed sophisticated stone technology, clothing, fire-making knowledge and social networks. None of this can simply be projected onto Ireland as fact. No Irish tool kit, camp plan or hearth from 31,642 BCE has yet been securely identified. At most, the Castlepook femur allows the cautious possibility of a brief visit involving the acquisition or scavenging of reindeer meat.

That possibility still has consequences. It suggests that Ireland need not have been beyond the outer edge of human movement during every phase of the Ice Age. A party could have crossed from neighbouring lands by a route now altered by sea-level rise and glaciation, followed migratory animals, or made a short, risky expedition. These are interpretations, not established events. The archaeological expectation is not of villages or monuments but of faint, dispersed traces: stone tools, butchered bone, hearth residues or sheltered activity surfaces that later ice and changing coasts may have erased.

No Politics, No Religion, No Trade Record

For this period there is no evidence for political authority, organised conflict, diplomacy, formal religion, writing, schooling or exchange systems within Ireland. There are no names, languages or oral traditions that can be securely traced back to it. It would be misleading to fill those silences with imagined clans, shamans or hunting rituals. Humans elsewhere undoubtedly had social lives, learned skills and symbolic practices, but the Irish record around this date cannot reveal their equivalents.

The strongest story is environmental rather than institutional. Ireland was part of a changing north-west European zone where animal dispersal, ice expansion, lowered seas and ecological disruption repeatedly opened and closed possibilities. Castlepook preserves a rare fragment of that world. Its fossils show that Ice Age Ireland was not an empty abstraction, even when human evidence remains uncertain.

What This Date Can Mean

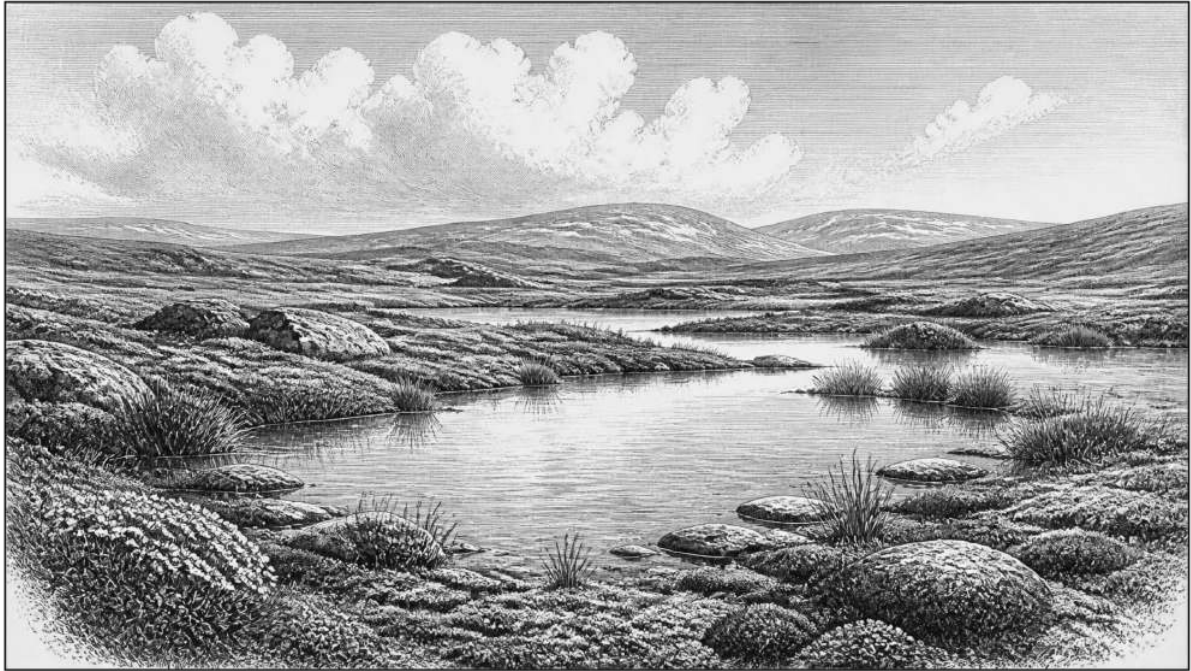
31,642 BCE is best treated as a point within a wide archaeological horizon, not as a year with a recoverable event. The evidence supports a cold, open and unstable Irish environment in the broader late Ice Age; a notable north Cork fauna that included reindeer, mammoth, giant deer, bear and spotted hyena; and an unresolved but important possibility of human carcass processing at Castlepook. It does not support a story of permanent settlement or a detailed account of society.

That restraint is not a failure of history. It is the proper response to deep time. The Castlepook femur problem remains valuable precisely because it forces difficult questions about evidence: whether one mark was made by a tool, whether its age and context can be demonstrated, and how much of Ireland's earliest human past lies hidden in caves, beneath later glacial deposits or under the sea.

Chapter 060 of 100

31641 BCE

Mammoths Before the Advance ^[60]



The label 31,641 BCE is a modern chronological convenience, not a year that can be isolated in Ireland's archaeological record. It corresponds approximately to 33,590 years before AD 1950, the conventional radiocarbon "present", but radiocarbon results require calibration and have substantial ranges at this depth of time. The responsible frame is therefore not a single year but the later part of Marine Isotope Stage 3, a fluctuating cold phase of the Late Pleistocene. The most relevant Irish environmental evidence, from organic sediments at Derrynree near Maguiresbridge in County Fermanagh, has produced calibrated ages spanning roughly 36,900–31,700 years ago. This numbered year falls within that broad interval, not at an identifiable episode within it.

A Landscape Known Through Sediment

Derrynree is exceptionally important because it preserves organic-rich freshwater silts between two layers of glacial till. Such a sequence records a spell when water, plants and animals occupied a lowland basin before later ice overrode and sealed it. The deposit cannot supply a diary of Ireland in 31,641 BCE; its dates and sediments represent an accumulated environmental interval. Yet pollen, seeds, plant fragments and insects can illuminate conditions in the north-west of the island during a period for which archaeological sites are almost wholly absent. They indicate open, cold ground rather than forest: a wet tundra or muskeg landscape with shallow pools, abundant mosses and plant matter, surrounded by sparse vegetation able to withstand long, severe winters.

One particularly evocative element is the fossil evidence for fringed sandwort, *Arenaria ciliata*, at Derrynree. It is a plant now associated with Arctic-alpine environments, and its Late Pleistocene occurrence confirms that Ireland then supported a flora far removed from the island's modern green, wooded appearance. That does not mean every district resembled the Fermanagh basin. Ireland's terrain,

drainage and exposure varied greatly, while the sediments themselves offer a local record. Nevertheless, Derrynree gives the clearest securely dated indication that parts of Ireland held open tundra vegetation during this broad period.

Cold, But Not Permanently Buried

This was not yet the fullest extent of the last British–Irish Ice Sheet. Later research places Ireland's maximum last-glacial ice cover broadly between about 27,000 and 23,000 calibrated years ago, although advance and maximum extent differed from sector to sector. At the time represented by the Derrynree dates, the island's climate was cold and unstable, but at least some areas were sufficiently ice-free for freshwater basins and their surrounding tundra to exist. The crucial historical fact is changeability: climates of Marine Isotope Stage 3 could shift markedly over centuries and millennia. A habitable-looking wetland should not be mistaken for a mild or secure environment. It was part of a landscape on the threshold of much more extensive glaciation.

Ice nevertheless shaped the setting long before it covered all of Ireland. Earlier glacier advances had eroded older surfaces, redirected drainage and deposited the tills that underlay Derrynree's freshwater sediments. Later ice covered the basin again, creating the layered archive by burying its organic material beneath another till. Modern reconstructions of the British–Irish Ice Sheet show that expansion was neither uniform nor instantaneous: different marine and terrestrial sectors advanced at different times. That geological history explains both why Ireland's surviving record is fragmentary and why rare protected pockets of silt, cave fill and bone matter are so valuable.

Mammals in the Southern Caves

County Cork and County Waterford caves supply a second, very different line of evidence. Castlepook Cave, near Doneraile, has yielded more than 2,000 animal bones from deposits ranging across a long stretch of the Ice Age. Its documented fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later cold-stage material includes Arctic fox, wolf and lemmings. Shandon Cave near Dungarvan also produced mammoth, reindeer and horse remains. These assemblages demonstrate that Ireland was periodically part of a wider north-west European ecological zone in which large herbivores and carnivores could reach and inhabit the island.

They must, however, be handled with care. The old cave excavations were undertaken before modern field recording, and bones could be redeposited by water, scavengers, roof collapse or later disturbance. Moreover, newer laboratory methods have shown that some early radiocarbon measurements on Irish cave bones were too young. Re-dating has pushed parts of the Castlepook fauna further back within Marine Isotope Stage 3 and suggests that giant deer and spotted hyaena may have disappeared locally well before the Last Glacial Maximum, perhaps around 40,000 calibrated years ago. Thus it is responsible to say that the caves reveal the ecological world of this general era; it is not responsible to place a particular mammoth, hyaena pack or reindeer herd in Ireland in this exact modern-numbered year.

People: Evidence and Silence

There is no securely dated human settlement, hearth, tool-making floor, burial or occupation site in Ireland from around 31,641 BCE. Nor is there defensible evidence for a political community, a leader, warfare, diplomacy, religious observance, language or formal learning on the island at this point. These

are not gaps that historical imagination should fill with a generic band of hunters. They are questions to which the current Irish record supplies no answer. The earliest strong evidence for a human incursion belongs much later, in the terminal Pleistocene: cut-marked bear bone from Alice and Gwendoline Cave in County Clare has been dated to approximately 12,810–12,590 calibrated years ago. Sustained settlement is later still, beginning in the Mesolithic.

This absence does not prove that no person ever set foot in Ireland during Marine Isotope Stage 3. Archaeologists allow for the possibility of brief, unsuccessful or archaeologically invisible visits, especially where later glaciers may have destroyed open-air evidence. Four isolated Irish lithic finds have been described as Lower or Middle Palaeolithic in appearance, but their uncertain provenance or reworked contexts prevent them from establishing occupation. The distinction matters: a plausible route, abundant animals or a hospitable interval is not evidence of people. For 31,641 BCE, the proper conclusion is agnosticism rather than either assertion or denial.

Economy Without Human Economy

Accordingly, there can be no account of farming, markets, craft production, trade or domestic routine in Ireland for this date. The relevant “economy” was ecological. Grazing and browsing animals converted the productivity of open vegetation into mobile meat, hides, bone and dung; predators and scavengers redistributed carcasses; pools and wetlands concentrated water, plants and insects. Cave accumulations may preserve some of the resulting food webs, but they do not by themselves disclose how every bone arrived in a chamber. At Castlepook, the evidence for spotted hyaena is especially important because carnivores probably helped create the bone assemblage. A cave is therefore a record of animal activity, geological transport and excavation history as much as a snapshot of living communities.

Long-distance movement is better understood at the scale of species than of human exchange. Low global sea levels altered coastlines and expanded exposed shelves around north-west Europe, but the precise geography of crossings into Ireland and the changing availability of routes remain debated. The presence of large mammals shows that dispersal happened during favourable phases, but it does not demonstrate a permanent land bridge at this date. Ireland’s position at Europe’s north-western edge could make colonisation episodic and local extinctions likely when climates deteriorated or ice and sea barriers changed.

No Known Ritual Landscape

Religion and culture leave no direct traces for Ireland in this interval. There are no monuments, grave goods, rock art traditions or objects that can be assigned to it. Natural features later invested with cultural significance—caves, springs, ridges and river valleys—were already physically present or developing, but no continuity of meaning can be projected backwards across tens of millennia. The most legitimate cultural lesson is methodological. Derryvree’s tiny fossils and Castlepook’s contested bones show how Ireland’s deepest past is reconstructed by combining stratigraphy, palaeobotany, zooarchaeology, radiocarbon calibration and glacial geomorphology, while preserving the boundary between measured evidence and interpretation.

The Approaching Transformation

For Ireland, the importance of this period lies in what followed. The freshwater tundra documented in Fermanagh and the mammal-rich landscapes represented in southern caves belonged to an interval before the last ice sheet expanded across the island and continental shelf. Later glacial erosion removed or deeply buried much of the preceding land surface, contributing to the striking scarcity of Palaeolithic archaeology. When people eventually arrived in a lasting way after the Ice Age, they entered an island ecologically and geographically transformed from this Late Pleistocene world. Around 31,641 BCE, then, Ireland's story is not one of named peoples or events. It is the history of tundra water, migrating animals, climatic instability and the fragile deposits that allow those vanished conditions to be known at all.

Chapter 061 of 100

31640 BCE

Sedges Beneath a Fermanagh Drumlin^[61]



Modern calendar-year precision is not available for Ireland in 31,640 BCE. The number is a retrospective label, not a date that any contemporary community could have recorded, and it corresponds only approximately to 33,590 years before AD 1950. At this depth of time, the responsible historical frame is a calibrated range measured in centuries or millennia. Ireland was in the Late Pleistocene, within the long and climatically unstable cold stage often termed the Midlandian in Irish stratigraphy and Marine Isotope Stage 3 in the wider scientific literature.

The strongest evidence relevant to this nominal year comes not from a settlement, tool-kit or human burial, but from sediments exposed beneath a drumlin at Derryvree near Maguiresbridge, County Fermanagh. Organic-rich freshwater silts and fine sands there lay between two layers of glacial till: material deposited by ice. A radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP from the deposit calibrates broadly to about 36,900–31,700 calendar years BP. The range includes the modern chronological label 31,640 BCE, but it cannot identify a particular season, generation or event within it. Derryvree is therefore an environmental window on Ireland around this time, not a dated snapshot of one year.

A Cold, Ice-Free Interval

The Derryvree sequence shows that north-central Ireland was ice-free during at least part of this earlier late-glacial interval, before the principal expansion of the last Irish Ice Sheet. This does not mean a mild or familiar landscape. The plant and insect evidence indicates open, treeless ground in a periglacial climate: terrain shaped by severe frost, short growing seasons and long winters. The landscape was

neither the green, wooded Ireland of later millennia nor an unbroken white ice cap. It was a patchwork in which wet hollows, shallow pools, sedge-rich margins and mossy ground existed among exposed, sparsely vegetated surfaces.

Freshwater mosses, sedges and other plant remains at Derryvree are especially valuable because they record local habitat rather than simply distant pollen blown on the wind. Pollen is poorly preserved in parts of the deposit and some grains may have been redeposited, so individual plant identifications require caution. Taken together, however, the evidence supports an open tundra or muskeg-like environment. Bogbean, lesser clubmoss and mountain avens are among the plants represented in the wider fossil record of the deposit. Their presence demonstrates that cold-adapted vegetation could occupy waterlogged niches close to the edge of expanding ice.

This was not necessarily a uniformly barren country. Wetlands can be productive even in cold climates, supplying plant matter for insects and grazing animals while trapping and preserving organic remains. Yet productivity was seasonal and precarious. Frost heave, seasonal thaw, shifting watercourses and wind exposure would have made many places difficult to occupy for long. The sedimentary record preserves this ecological setting precisely because it was later sealed beneath advancing ice; much contemporary surface evidence was destroyed, buried or carried away by glacial erosion.

Before the Main Ice Advance

At approximately 33.6 thousand calendar years BP, the island stood in the approach to the Last Glacial Maximum rather than at its peak. Reconstructions differ in regional detail, but evidence from Fermanagh, southern Ireland and the continental shelf indicates that the last Irish Ice Sheet built up after roughly 34,000 calendar years BP and reached its greatest overall extent much later, around 27,000–23,000 calendar years BP. During that maximum, ice covered Ireland and extended across much of its surrounding shelf. The familiar outlines of the modern island are therefore a poor guide to its Ice Age geography.

Global sea level was substantially lower because vast quantities of water were held in ice sheets. Coastal plains and sections of the continental shelf now underwater were exposed or altered, while shorelines lay far from many modern coasts. Nevertheless, it is unwise to imagine a simple, permanent land bridge linking Ireland, Britain and continental Europe. Routes changed with sea level, local ice, rivers and marine conditions. Any movement of animals or people involved a landscape now largely lost beneath the sea, and the ease, timing and exact character of crossings remain subjects of research.

The future conflict between ice and inhabitable ground was geological, not political. There were no states, borders, rulers, treaties or recorded wars in Ireland. Nor is there evidence from this date for organised territorial communities. The advancing and retreating ice did, however, impose the fundamental constraint upon all life: it repeatedly created, fragmented and erased habitable terrain. That environmental instability helps explain why Ireland's early archaeological record is so thin.

Caves and the Animal Evidence

Southern Irish caves provide another imperfect but important record. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork has yielded remains of woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, hare and spotted hyena. The National Museum of Ireland

identifies it as the country's most important cave site for mammals of the last cold stage. These bones show that sizeable herbivores and their predators reached Ireland during parts of the Late Pleistocene, although they do not all prove that every species lived together at precisely the same moment.

Modern redating has made the cave archive both more useful and more difficult. Improved methods have shown that several old radiocarbon measurements from southern Irish caves were substantially too young, placing elements of the Castlepook fauna earlier in Marine Isotope Stage 3 than once thought. Some giant deer and spotted-hyena evidence may date to before about 40,000 calendar years BP. Other dated Irish animal remains overlap broadly with the middle of the 30,000s calendar years BP. Cave deposits may be dens, traps, scavenging sites, water conduits and excavation spoil-heaps at once; bones recovered in early twentieth-century digs do not always retain a secure original context.

The appropriate conclusion is substantial but limited. Late Pleistocene Ireland supported, at favourable times and places, a cold-adapted fauna that included large grazers and browsers, scavengers and predators. Reindeer and mammoth evoke open country, while the Derryvree wetland record supplies the local detail of pools, sedges and mosses. This is evidence for ecological connections with north-west Europe, not proof of an unchanging 'mammoth steppe' spread evenly across the island. Climate oscillated, habitats were patchy and the dated specimens are separated by uncertainties that can exceed many human lifetimes.

The Question of People

Human history at this date remains an open question rather than a settled narrative. A reindeer femur from Castlepook has been publicly reported as about 33,000 years old and as bearing deep marks interpreted by zooarchaeologist Ruth Carden as resulting from butchery with a stone tool. If that interpretation is confirmed by fuller publication and continued specialist scrutiny, it would be the earliest known indication that people handled an animal in Ireland, far earlier than the well-established post-glacial archaeological record.

It cannot, however, establish a permanent population in 31,640 BCE. The specimen comes from an old cave collection, not a modern excavation of an intact occupation floor. There is no securely associated hearth, stone-tool assemblage, dwelling, burial, artwork or food-processing area of equivalent age in Ireland. A date on an animal bone records the animal's death, not automatically the exact moment when a mark was made, the location of its killing, or the duration of any human visit. The careful formulation is therefore that Palaeolithic activity in Ireland is possible and potentially evidenced, but sustained settlement is not demonstrated.

If small hunter-gatherer parties did reach the island during this broad period, the animal record makes short, mobile visits in pursuit of seasonal resources plausible. That is an interpretation, not direct evidence. We cannot responsibly supply their language, kinship system, clothing, beliefs or route of travel. Nor can a possible butchery mark reveal whether visitors hunted reindeer, scavenged a carcass, returned regularly, or left descendants. Archaeology has not identified an Irish Upper Palaeolithic society comparable in evidential richness to those known in parts of Britain or continental Europe.

Society Without a Social Record

For the same reason, political affairs, diplomacy and conflict are absent from the record. A hyena skull, a mammoth bone or a sedge seed cannot tell us who controlled territory or how people related to one another. There is no evidence for chiefs, clans, formal exchange networks, monuments or ritual

places. It would be misleading to dress ecological evidence in the language of later Irish history.

Religion, culture and learning leave no secure trace either. The caves may have offered shelter to animals and possibly temporary refuge to people, but there is no basis for calling them sanctuaries or ceremonial sites. No art, ornament, musical instrument, inscription or intentionally structured burial of this antiquity has been recovered in Ireland. The absence matters: it marks the boundary between what the evidence can show and what an engaging story might be tempted to invent.

Economy and trade must likewise be understood at the most basic level. There was no evidence for farming, herding, metalworking, pottery or commerce. The economy visible in the fossils was an ecological one: plants drew on the brief growing season; herbivores exploited open vegetation and wetland margins; carnivores and scavengers followed prey and carrion. Possible human visitors, if present, would have depended on the same fragile food web. Any transfer of stone, hides, meat or knowledge between Ireland and neighbouring lands is conceivable, but presently unproven.

An Archive of Limits

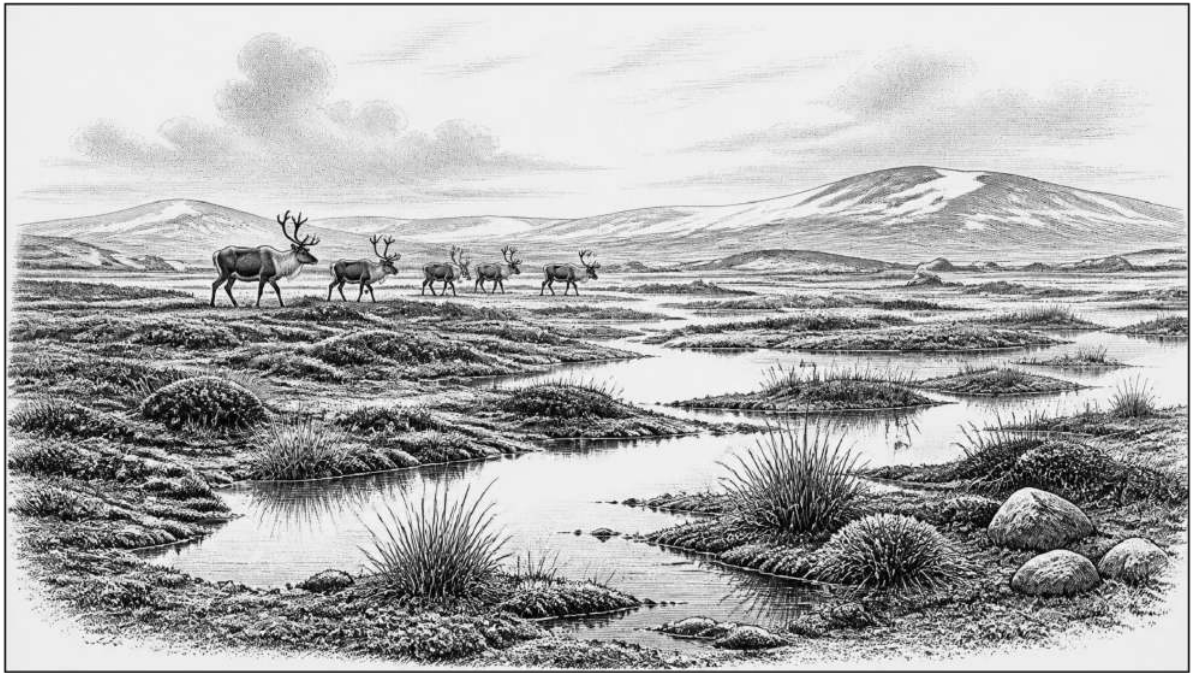
Ireland around 31,640 BCE is best approached through Derrynvree's buried freshwater landscape and the cave faunas of the south. They reveal an island—or a changing landmass at Europe's Atlantic edge—where cold open habitats, wetlands and large mammals existed before the fullest reach of the last ice sheet. They also reveal how quickly that world could disappear beneath ice and how much evidence it took with it.

The great development of this period was therefore environmental: a habitable but severe landscape was being overtaken by the conditions that would culminate in widespread glaciation. The human story is not yet one of communities, institutions or remembered events. It is a question preserved in a few bones and sediments. Derrynvree's sedges, mosses and insects provide firmer testimony than any imagined Ice Age drama: they show that, within a broad calibrated interval embracing this modern date, life persisted in cold Irish wetlands beneath the shadow of the advancing ice.

Chapter 062 of 100

31639 BCE

Derryvree's Sedgebound Interval ^[62]



The label 31,639 BCE is a modern way of locating a point deep in prehistory, not a year that anyone in Ireland could have named or recorded. No archaeological method can isolate events in a single calendar year so far back. It is better treated as a notional point about 33,600 calendar years before 1950, within Marine Isotope Stage 3 of the Late Pleistocene. Radiocarbon measurements from this depth of time calibrate to broad probability ranges, rather than yielding anniversary-like precision. The responsible history of Ireland at this point is therefore a history of sediments, fossil plants, animal bones, changing ice and carefully limited inferences—not a chronicle of rulers, battles or settlements.

At the broad scale, the evidence indicates that parts of Ireland were still ice-free around this horizon, before the great expansion of the last Irish ice sheet. This did not make the country mild, wooded or densely inhabited. It was a cold, exposed landscape in a period of abrupt North Atlantic climatic change. Later glaciers would reshape much of it and remove or bury many traces. That destructive history explains both why the surviving evidence is precious and why it cannot bear more narrative weight than it possesses.

Time Measured in Ranges

The most useful chronological anchor is Derryvree, near Maguiresbridge in County Fermanagh. Road works exposed a sequence inside a drumlin: glacial till below, organic-rich freshwater silts and fine sands in the middle, and a later till above. Till is debris deposited directly by glacier ice. The arrangement proves that there was an interval between two glacial episodes when water, plants and small animals

occupied this spot. A conventional radiocarbon determination from the organic material was 30,500 radiocarbon years BP, with a substantial uncertainty. Subsequent calibration has been expressed as an approximate range of 36,900–31,700 calendar years BP.

That range encompasses the modern label 31,639 BCE only in the loosest chronological sense. It cannot show that the Derryvree pool existed continuously throughout that span, nor that every specimen from its layers belonged to the same season or generation. The date is nevertheless important: alongside comparable deposits at Greenagho and other Fermanagh sites, it supports the conclusion that north-central Ireland retained ice-free ground until at least roughly 34,000 years ago. The later Last Glacial Maximum, when ice covered Ireland and extended across much of its continental shelf, lay ahead.

A Wetland Beneath the Drumlins

Derryvree is the clearest local window onto the environment. Its fossil flora included freshwater mosses and sedges, while other identified remains include bogbean and water-milfoil. Insect evidence was of cold northern aspect. Together these remains support an interpretation of shallow freshwater, wet ground and treeless tundra or muskeg vegetation under periglacial conditions: a climate in which seasonal freezing and thawing were fundamental landscape processes. The scene was not an empty sheet of snow. It included pools, saturated margins, low plants and patches of exposed mineral ground, all changing with water level and season.

Yet this reconstruction must remain local. A sediment-filled hollow in Fermanagh is not a complete map of Ireland. Conditions varied with altitude, drainage, distance from the sea, the presence of local ice and the rapid climatic oscillations characteristic of the period. Nor does ‘tundra’ imply one uniform plant community. It is a useful ecological description for an open, cold landscape with little or no tree cover, rather than a claim that every modern Irish county looked identical. The organic silts preserve a rare surviving habitat; much of the wider evidence has either been eroded by later ice or now lies beneath sea and younger deposits.

Castlepook’s Animal Record

In north County Cork, Castlepook Cave—historically called Mammoth Cave, near Doneraile—offers a different kind of archive. More than 2,000 bones have been recovered from its passages and chambers. Geological Survey Ireland describes it as Ireland’s richest site for vertebrate fauna in the period leading towards the Last Glacial Maximum. Individual bones range widely in age, roughly from 45,700 to 19,950 years BP, so the cave was a repository accumulating material over a long interval, not a frozen snapshot of one living community.

The fauna associated with its older Ice Age deposits includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; later cold-stage material includes Arctic fox, wolf and lemmings. This is strong evidence that Ireland could at times sustain a varied large-mammal fauna, including predators as well as herbivores, during the Late Pleistocene. The remains also suggest that Ireland was not ecologically isolated in the modern sense. Animals had reached it from the wider north-west European landmass when changing sea level, ice and exposed shelf landscapes permitted movement. Precisely where dry routes, shallow waters, coastal corridors or ice barriers lay at any moment remains uncertain.

Cave assemblages require especial caution. Many Castlepook deposits were excavated in the early twentieth century, water has disturbed material, and carnivores themselves could carry, gnaw and redistribute bones. A hyena den is not a hunting camp, and a mammoth bone in a cave does not

automatically mean mammoths lived at its entrance. The scientifically secure conclusion is that these species occurred in Ireland within overlapping broad time ranges. Claims about direct predator-prey encounters, seasonal migration routes or the precise composition of a local herd go beyond the evidence.

The Human Question

There is no accepted settlement, hearth, house floor, stone-tool assemblage, burial or human skeletal remain securely dated to around 31,639 BCE in Ireland. Accordingly, there is no basis for describing a resident population's social organisation, language, kinship, religious practice or territory. Political affairs, diplomacy and warfare leave no identifiable record here because there is no demonstrated polity or community to which such terms can responsibly be applied.

A reindeer femur from Castlepook has been publicly presented as bearing a deep mark consistent with cutting by a sharp stone tool, and its age has been reported as about 33,000 years ago. If the surface modification is confirmed as human-made and contemporary with the death of the animal, it would be an exceptionally early sign that a person processed a reindeer carcass in Ireland. It would not, by itself, establish a camp, permanent settlement, named archaeological culture or population continuity. The distinction matters. A single modified bone records, at most, a brief action at a carcass; it cannot reveal how many people were involved, whether they travelled repeatedly, or whether they left descendants.

The more securely published evidence for a human presence is much later: a butchered brown-bear kneecap from Alice and Gwendoline Cave in County Clare, independently dated to about 12,810–12,590 calibrated BP. That discovery demonstrates why close study of old cave collections can change the story of Irish prehistory. It should not, however, be used to fill the much earlier interval with imagined hunters, camps or rituals.

Life, Economy and Culture: What Cannot Be Claimed

If people did visit Ireland in this broad period, they would have required knowledge, cooperation and practical skill to survive a cold, highly seasonal world. Across north-west Europe, Upper Palaeolithic groups made sophisticated stone and organic tools, used fire, shared food and maintained social links across considerable distances. But those are continental comparisons, not direct Irish finds. No Irish evidence of this age supports assertions about clothing, dwellings, food-sharing arrangements, exchange networks, artistic traditions, belief or learning. Equally, there is no evidence for farming, herding, cultivated crops, metals, pottery, monuments, trade goods or formal religion.

Economy at Derrynvree was ecological rather than human: wetland vegetation fixing carbon, insects inhabiting cold ground, herbivores feeding across open country and carnivores exploiting animal carcasses. At Castlepook, the co-occurrence of large herbivores and predators points to food webs capable of supporting both. It does not show a human hunting economy. The crucial regional change was environmental. Ice-free but severe habitats were being overtaken within millennia by the growing British-Irish Ice Sheet, which eventually transformed Ireland's terrain and erased or sealed much of what came before.

An Ireland Before Historical Ireland

This is therefore not yet Ireland of kingdoms, saints, languages or even demonstrable villages. It is Ireland as a shifting part of the north-west European Pleistocene world: a landscape of cold pools and sedges at Derrynree, caves accumulating the remains of mammoth, reindeer and hyena in Cork, and an ice sheet whose later advance would redraw the island. The evidence permits a vivid environmental history, but it also imposes discipline. Around this nominal date, Ireland's best-documented inhabitants are plants and animals. Human history remains a question, not a settled fact.

Chapter 063 of 100

31638 BCE

Castlepook's Open Corridor^[63]



The label *31,638 BCE* gives a useful point of orientation for a very remote past, but it must not be mistaken for a date that prehistoric Ireland can resolve. No written calendar, settlement sequence or archaeological layer identifies one particular year. In calendar conversion it is roughly 33,587 years before AD 1950 (cal BP), but that is a modern numerical translation, not an ancient Irish date. The responsible picture is therefore regional and approximate: Ireland lay in the later part of Marine Isotope Stage 3, a long, climatically volatile phase before the Last Glacial Maximum. The evidence can illuminate conditions across ranges of centuries or millennia, not the doings of a named generation in this nominal year.

A Cold Interval Before Maximum Ice

Ireland was not yet uniformly buried beneath the last great ice sheet at this point. The British–Irish Ice Sheet would later expand across the island and beyond its present western shoreline, reaching its greatest Late Pleistocene extent tens of centuries afterwards. Work on the chronology of the ice sheet indicates a long build-up from broadly ice-free conditions in parts of Ireland at about 34,000 years ago to major expansion later in the glacial cycle. That broad reconstruction matters more than any claim that an ice margin stood at a precise place in 31,638 BCE.

The island's geography also differed from the familiar modern map. Global sea level was substantially lower during the glacial period, exposing more of the continental shelves around Ireland and Britain. Yet lower sea level did not automatically create a simple, continuous walking route to every coast, nor can present evidence establish exactly which crossings were available in this particular year. It is safer

to say that Ireland was part of a changing north-west European zone in which coastlines, shallow seas, ice fronts and animal routes repeatedly altered. Migration to and from the island was possible during some phases, but difficult, contingent and vulnerable to abrupt climatic change.

In this setting, “Ireland” was not a country, a people or a political territory. There were no known rulers, boundaries, alliances, diplomatic contacts or organised wars that archaeology can assign to the island. Nor is there evidence for villages, farms, monuments, graves, ritual sites, art, spoken languages or teaching traditions. These are not omissions in a fuller historical record: they are questions for which the surviving Irish evidence around this date is silent. The principal historical actors recoverable here are ice, water, plants, animals and, perhaps, occasional people.

Derryvree’s Tundra Evidence

The most informative window on Ireland near this broad period is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed organic-rich freshwater silts and fine sands lying between two tills: deposits laid down by ice. This sequence is exceptionally valuable because it records an earlier glacial advance, a later interval when open water and wet ground existed, and renewed ice cover after the sediments accumulated. It is evidence for changing environmental conditions rather than for a stable Ice Age landscape.

A radiocarbon determination from Derryvree was reported as 30,500 years BP, with a large uncertainty. Subsequent discussion and calibration place the deposit broadly within an interval of about 36,900–31,700 calibrated years BP. The nominal year 31,638 BCE, approximately 33,587 cal BP, falls within that very wide calibrated span. This does not mean that the Derryvree wetland can be dated to the year in question. It means that the deposit is among the best available environmental comparators for Ireland around it.

The organic layers contained freshwater mosses and sedges, pollen of predominantly herbaceous plants, and insect evidence of cold northern conditions. Plant macrofossils included species associated with open, wet, tundra-like ground; pollen preservation was poor, so the record must not be read as a complete botanical census. Still, its combined signals strongly support a periglacial landscape: ground repeatedly affected by frost, sparse vegetation on better-drained surfaces, and pools, marshes or sluggish freshwater in sheltered hollows. It was not an evergreen wilderness or a blanket of snow without life. Nor was it later prehistoric Ireland stripped of its woods. Trees, if present locally at all, were not forming the closed forest familiar from the post-glacial Holocene.

The Derryvree evidence also helps to explain why later ice has made the earlier human record so elusive. Glaciers erode, redistribute and bury sediments. A habitat may have been available for centuries, yet camps, hearths, footprints and stone tools can subsequently be removed or concealed under till. The absence of a known camp from this period is consequently not proof that no person ever stood on Irish ground; it is, however, decisive against inventing a settled population or a continuous Irish community.

Castlepook and the Faunal Record

Far to the south, Castlepook Cave near Doneraile, County Cork—also called Mammoth Cave—offers another, very different archive. Excavations conducted principally in the early twentieth century recovered a remarkable collection of Pleistocene animal remains. Material from Castlepook includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The National Museum of Ireland regards the cave as the country’s most important source

of mammal remains from the last cold stage. These animals did not necessarily occupy the cave simultaneously, and the old excavations disturbed or inadequately recorded parts of the deposits. The collection is powerful evidence of a fauna over a lengthy period, not a snapshot of a single landscape on a single day.

Nevertheless, it shows that Ireland could at times support, or be visited by, a varied cold-stage animal community. Reindeer imply open ground and seasonal grazing opportunities; lemmings and Arctic fox point towards strongly northern ecological conditions. Mammoth and giant deer evoke a productive but exposed mosaic of herbs, grasses, sedges and low shrubs rather than dense woodland. Wolves and spotted hyaenas remind us that carcasses were contested resources. Cave accumulations may result from animals dying naturally, predators dragging in prey, scavenging, water movement and human activity. Bone assemblages therefore need painstaking contextual analysis before they become stories of hunts or households.

A reindeer femur from Castlepook has become central to debate about the earliest possible human activity in Ireland. Ruth Carden identified a deep mark on the bone as consistent with cutting or chopping by a sharp stone tool, and a date of roughly 33,000 years ago has been widely publicised for the specimen. If that interpretation and association are sustained by further research, it would suggest a brief Upper Palaeolithic human presence far earlier than the previously accepted Irish evidence. But it is not a securely excavated campsite, no human remains have been found, and the specimen derives from historic cave excavations with limited modern stratigraphic control. The National Museum of Ireland accordingly continues to state that clear Palaeolithic evidence for humankind in Ireland has not emerged.

That caution is not pedantry. A cut-marked bone can demonstrate a specific action only if the mark's origin, timing and archaeological context can be tested. It cannot, by itself, identify the hunter's language, sex, age, homeland, social group, route of travel or length of stay. Around 31,638 BCE, Castlepook is best understood as evidence for a potentially habitable animal corridor and a tantalising possibility of human butchery, not proof of Ireland's first settled society.

Mobility Rather Than Settlement

If people did reach Ireland in this phase, their most plausible economy would have been highly mobile hunting and gathering, comparable in broad terms to Upper Palaeolithic lifeways elsewhere in north-west Europe. Reindeer, other large herbivores and the predictable places where animals crossed valleys or approached water would have offered food, hides, bone, antler and sinew. But this is an inference from the animal record and continental comparison, not direct Irish evidence for a camp, tool kit or seasonal round. No traded object, quarry, boat, dwelling or food-processing area has been securely dated to this time in Ireland.

There is likewise no responsible basis for describing political affairs, conflict, diplomacy, formal religion or learning. Small mobile groups elsewhere in Ice Age Europe certainly possessed sophisticated knowledge, social relationships and symbolic practices, but none may simply be transferred to Ireland. An encounter over a reindeer carcass, a short hunting visit, or a predator's use of a cave would be historically significant here precisely because the island sat at the fragile north-western edge of a wider human and animal world.

An Unstable Future

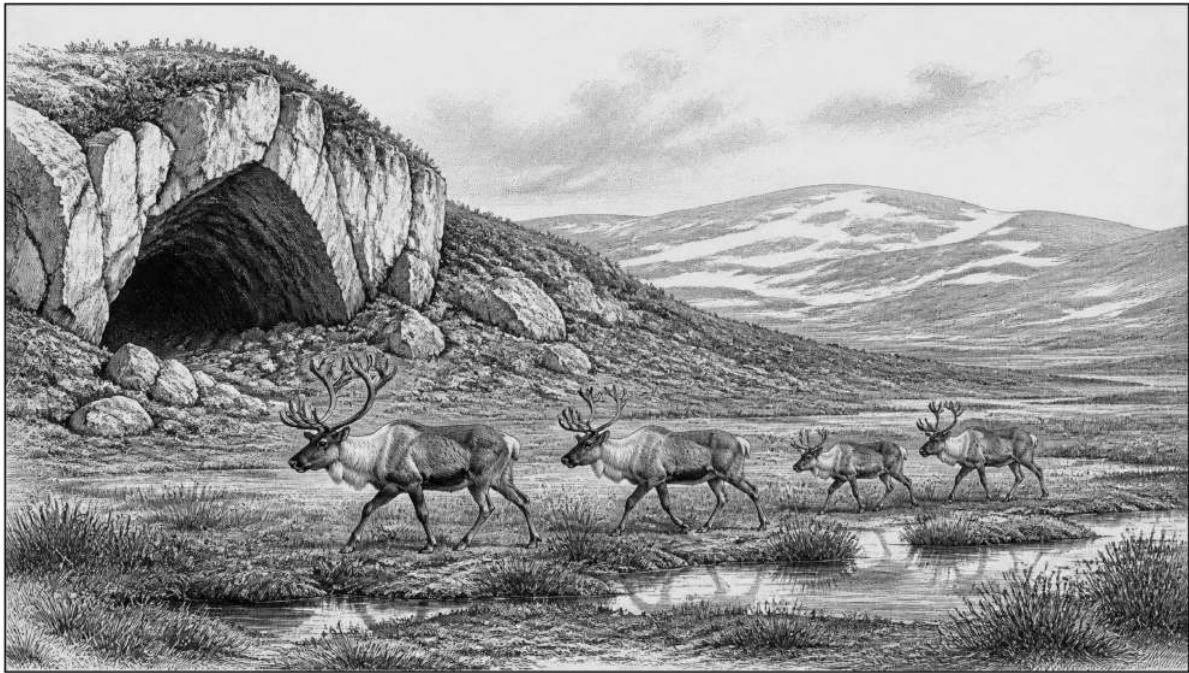
Crag Cave in County Kerry preserves calcite formations whose episodes of growth track warmer pulses during the last glacial period. Because stalagmites require infiltrating liquid water, their growth provides independent evidence that south-west Ireland responded sharply to millennial-scale climatic shifts. In colder phases, permafrost and frozen ground curtailed such growth; in milder interstadials, water could again circulate through shallow cave systems. The lesson for 31,638 BCE is not that the whole island shared one uniform temperature, but that Irish environments could change markedly over intervals short by geological standards and long by human ones.

That instability ultimately shaped the historical outcome. As climatic deterioration continued and the last ice sheet grew, habitable patches and animal corridors contracted or were rearranged. Any early visitors to Ireland left, if they came at all, no demonstrated continuous descendant community through the glacial maximum. Secure evidence for people returns only much later, after deglaciation, in a very different island world. Around this nominal year, the most defensible history is thus one of open, cold wetlands and grass-herb country; large mammals and carnivores moving through a changing landscape; caves preserving fragmentary bones; and a single contested clue that may yet bring people into the picture.

Chapter 064 of 100

31637 BCE

Awbeg's Reindeer Crossing^[64]



31,637 BCE is a modern label placed on a time far beyond the reach of written history. No community in Ireland counted years in this way, and neither radiocarbon dating nor glacial stratigraphy can isolate an event, individual or season within one calendar year so remote. The responsible historical frame is therefore broader: roughly 33,600 calendar years before present, within the unstable cold conditions of Marine Isotope Stage 3, part of the last Ice Age. For Ireland, the evidence comes not from settlements or chronicles but from cave bones, buried wetland sediments, pollen, plant remains, insects and the geological traces of advancing ice.

A Date Within Broad Ranges

Calibrated dating is essential to this subject. Radiocarbon laboratories measure remaining radioactive carbon and produce a radiocarbon age; that result must then be calibrated against independently established atmospheric records. At depths of more than thirty millennia, the resulting ranges can be wide. A useful northern Irish sequence at Derrynree, near Maguiresbridge in County Fermanagh, produced a determination of about $30,500 \pm 1,100$ radiocarbon years before present from organic sediments. Its calibrated span covers several thousand years, broadly about 36,900–31,700 calendar years before present. The notional year 31,637 BCE falls within the wider environmental interval that this deposit can illuminate, but cannot be pinpointed within it.

That limitation matters. Ireland around this time was not frozen in one uniform state, nor can a single deposit speak for every coast, upland or valley. Climate during the middle part of the last glacial cycle fluctuated sharply. Ice masses expanded and contracted; local conditions depended on elevation, exposure, snow cover, drainage and distance from the Atlantic. The later Last Glacial Maximum, when

the British–Irish Ice Sheet reached its greatest overall extent, still lay ahead. Around this date, some parts of the island could support animal life and tundra vegetation during milder intervals, while other areas were affected by severe periglacial conditions or ice.

Derryvree Between the Tills

Derryvree is especially valuable because its freshwater sediments were sealed between two bodies of till, the stony debris laid down by glacier ice. Roadworks exposed silts and fine sands containing a striking assemblage of biological evidence: pollen, seeds, other plant macrofossils, mosses and insects. Later glaciation covered much of Ireland, eroding or rearranging older surfaces. The survival of such a sealed deposit gives a rare view of a landscape that was subsequently concealed beneath ice-derived material.

The evidence indicates open, treeless country rather than anything resembling later Irish woodland. Sedges, mosses and hardy herbaceous plants grew in wet ground beside shallow water. Finds including bogbean and water-milfoil point to freshwater habitats, while dwarf willow, mountain avens and other cold-tolerant plants indicate tundra-like surroundings. Insects and mosses add texture to this reconstruction. The landscape has been described as muskeg: waterlogged, peaty ground, broken by pools and vegetated margins, subject to frost and short growing seasons. This was not necessarily a featureless white wilderness. In a favourable season, low vegetation and wetland plants could be productive, but it was an exacting world of frozen ground, limited shelter and rapid environmental change.

Such evidence is direct evidence for organisms and sediments, not a photograph of daily life. It does not identify a particular lake shore in 31,637 BCE, nor prove that all Ireland shared the same plant cover. Yet it firmly corrects two misleading pictures: an island wholly entombed under ice at every moment of the period, and a familiar green, wooded Ireland awaiting human farmers. The available evidence instead favours a patchy cold-stage environment in which open vegetation, freshwater pockets and seasonal animal movement were important.

Castlepook's Animal Archive

In north County Cork, the limestone caves at Castlepook, in the Awbeg valley near Doneraile, preserve another kind of archive. Excavations conducted chiefly in the early twentieth century recovered a large collection of animal remains. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Not every species need have occupied the cave at the same time: old excavations did not record deposits to modern standards, and cave floors can combine material brought in by animals, water, collapse and people over long periods. Nevertheless, the collection demonstrates that Ireland supported, at intervals in the Late Pleistocene, a fauna far different from that of recent centuries.

Castlepook is particularly important for dating the broad pre-maximum cold stage. The Irish Quaternary Fauna Project used accelerator radiocarbon dating to reassess cave collections and concluded that a wide range of mammals reached Ireland between at least about 45,000 and 20,000 years ago. Subsequent work has also demonstrated why caution is needed: improved collagen purification has shown that some earlier bone dates could be substantially misleading. Individual dates and species lists are consequently best treated as evidence to be continually tested, rather than as a seamless timetable of occupation.

Even with that caution, the ecological implications are substantial. Reindeer and mammoth indicate open feeding grounds; lemmings and Arctic fox point to severe cold; wolves and hyaenas reveal a food web with active predators and scavengers. Hyaenas may have used caves as dens or repeatedly dragged in carcass parts, helping to explain damaged and scattered bones. A cave assemblage therefore records animal movement, predation, scavenging and geological processes as much as it records the place where an animal died. Castlepook was not a village, and it should not be casually described as one.

The Reindeer Femur Question

One Castlepook object is directly relevant to a date in the early thirty-second millennium BCE: a reindeer femur fragment reported as roughly 33,000 years old and carrying a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone edge during carcass processing. County Cork heritage material has presented the find as possible evidence that Upper Palaeolithic people handled reindeer in Ireland tens of millennia earlier than the previously accepted terminal-Pleistocene evidence.

The possibility is important, but the conclusion must remain conditional. The femur was recovered from an historic collection, not from a recently excavated occupation surface with its position, associated tools and overlying deposits recorded in detail. A date on bone establishes when the animal lived and died, not automatically when a surface mark was made. Identifying a cut mark also requires taphonomic judgement: trampling, carnivore activity, breakage, excavation damage and other processes can alter bone. No securely associated hearth, dwelling, stone-tool assemblage, burial, ornament, artwork or repeated butchery floor of this age has been published from Ireland.

If the incision is confirmed as a fresh-bone tool mark and is contemporary with the animal, it would show a remarkably small but consequential human footprint: at least one person used a sharp implement on a reindeer carcass. It would not show whether people killed the animal, found it after a predator's attack, took meat, hide, sinew or marrow, camped nearby, crossed the island regularly, or remained for more than a brief visit. Still less could it establish a tribe, language, political community or continuous ancestry linking those visitors to later inhabitants. The evidence permits the possibility of transient human incursions; it does not yet establish settled Palaeolithic Ireland.

Society Beyond Recovery

There is no responsible basis for describing political affairs, diplomacy, rulers, territorial boundaries or organised conflict in Ireland at this date. No human settlement is securely known from the period, and there are no records from which to recover names, beliefs or institutions. Likewise, there is no Irish evidence for houses, clothing, family organisation, ritual, art, burial practice, learning or language around 31,637 BCE. European Upper Palaeolithic communities elsewhere made sophisticated stone tools, ornaments and art, but proximity is not proof. Those wider traditions are useful context for what a hypothetical visiting hunting party might have known; they are not evidence that such objects or practices existed in Ireland.

The same restraint applies to economy and trade. The animal record shows resources potentially available in the landscape: large herbivores could yield meat, fat, hide, sinew and bone, while small mammals and birds may have added other seasonal opportunities. But Ireland has yielded no securely contemporary evidence of exchange networks, transport routes or a local economy. The sea level was much lower than today because considerable water was held in ice sheets, altering coastlines and the

extent of continental shelves. Yet the precise routes by which animals, and perhaps people, reached Ireland at particular times remain unresolved. Ecological connection with neighbouring lands should not be converted into a confidently drawn land bridge for this exact year.

An Island of Windows, Not Certainties

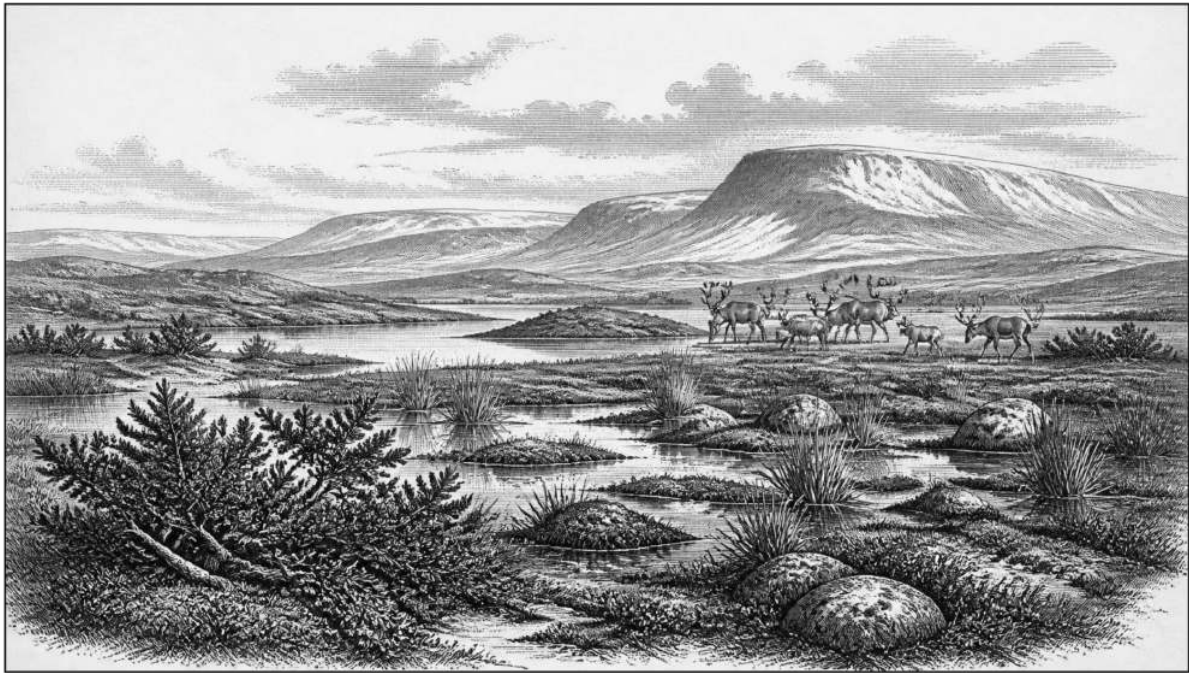
The most defensible picture is therefore one of environmental windows. During suitable phases, cold-adapted animals reached parts of Ireland and exploited open, wet, treeless habitats. Their remains survived especially in caves and in unusual sedimentary traps, although later ice and erosion removed much else. Derrynvree records freshwater tundra and muskeg in Fermanagh; Castlepook records an extraordinary southern fauna and the unresolved possibility of human butchery. Together they show that Ireland was neither absent from the ecology of Ice-Age north-west Europe nor yet a documented human homeland.

For 31,637 BCE, uncertainty is not a failure of history but a fact to be explained. The evidence is fragmentary because the landscape has been repeatedly glaciated, because caves are complex archives and because modern calendar years are much finer than Pleistocene dating can sustain. What can be said with confidence is more modest and more vivid: around this broad horizon, parts of Ireland contained cold open ground, freshwater wetlands and mobile herds and predators. Whether a very small number of people briefly joined that world remains one of the most compelling unanswered questions in Irish prehistory.

Chapter 065 of 100

31636 BCE

Castlepook's Earliest Question^[65]



31,636 BCE is a modern chronological label, not a year that can be recovered from the Irish archaeological record. It corresponds roughly to 33,585 years before AD 1950, the conventional reference point for “BP” dating, but neither radiocarbon science nor glacial deposits can identify happenings in a single calendar year at this depth of time. The responsible frame is a broad interval in the later part of Marine Isotope Stage 3 (MIS 3), during the last Ice Age and before the Last Glacial Maximum. Ireland’s evidence is sparse, discontinuous and often disturbed by later ice. It can illuminate landscapes, animals and a disputed clue to human activity; it cannot provide a year-by-year narrative of rulers, battles or settlements.

An Interval Rather Than a Date

The most relevant dated Irish environmental sequence lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 exposed organic freshwater silts and fine sands enclosed between two thick beds of till, sediment left by glacier ice. The order matters. Ice had occupied the locality, then freshwater and vegetation developed there, and later ice sealed the deposits beneath another till. A radiocarbon result of about $30,500 \pm 1,100$ radiocarbon years BP has been calibrated to a broad range of approximately 36,900–31,700 calendar years BP. The nominal date of 31,636 BCE falls within that range, but the deposit is not a diary entry for that year: it accumulated across an interval and carries both laboratory uncertainty and the limits of calibration.

Derryvree is especially valuable because later glaciation erased or buried so much of the contemporary land surface. Plant macrofossils, pollen, mosses and insects indicate a cold, open environment. Grasses, sedges, herbs, juniper and low-growing plants could survive where closed woodland could not; wet ground and shallow freshwater were locally important. This was not simply a

limitless white waste. Seasonal snow, exposed mineral soils, pools, streams, peat-like ground, slope and shelter would have created patches of differing productivity. Yet it was a treeless, periglacial world, far removed from the temperate, wooded island familiar today.

That local evidence should not be turned into a single map for the whole island. Ireland's climate was shaped by the Atlantic, changing sea level, relief and the shifting margins of the British–Irish Ice Sheet. Conditions could differ sharply between northern basins, southern limestone country, uplands and the then altered coastal margins. Crag Cave in County Kerry adds an important but different line of evidence: uranium-thorium dates show episodes of stalagmite growth during MIS 3. In this shallow cave, calcite growth required liquid water and is interpreted as evidence for intermittent climatic amelioration. It demonstrates instability rather than sustained warmth. Cold stadials and milder interstadials repeatedly reorganised water, vegetation, animal habitat and ice.

Ice, Water and Altered Coasts

There was no political Ireland in any meaningful later sense, and the physical outline of the land was not the modern coastline. Global sea level was lower during the Ice Age, exposing parts of the continental shelf, while ice, local crustal movement and changing drainage complicated the geography of the Irish Sea. It would be unsafe to picture a simple, permanent dry “land bridge” linking every part of Ireland to Britain or continental Europe. Equally, the present sea crossings cannot be projected unchanged into the past. Any movement of animals or people depended on a changing combination of exposed ground, water barriers, ice margins and favourable seasons.

Glacial reconstructions suggest that the bulk of the last Irish ice sheet expanded from relatively restricted or ice-free conditions around 34,000 years ago, with its advance unfolding unevenly over millennia; the southern coast was not crossed by inland Irish ice until much later, after about 24,000 years ago. Those are regional reconstructions, not a claim that every locality was open at 31,636 BCE. The Derryvree sediments nevertheless show that at least part of north-central Ireland had supported freshwater habitats during a pre-LGM interval. This is the principal environmental fact behind any responsible account of the island at this time.

Animals in the Cave Record

Southern Irish limestone caves supply the other major body of evidence. Castlepook Cave, near Doneraile in north County Cork, became known as Mammoth Cave after antiquarian excavations between 1904 and 1912 produced a remarkable accumulation of Ice Age bones. Much material entered the National Museum of Ireland's collections, where later zooarchaeological study and improved radiocarbon methods have transformed understanding of the assemblage. The Irish Quaternary Fauna Project showed that a wide range of mammals had reached Ireland between at least about 45,000 and 20,000 years ago. Subsequent re-dating, however, has also demonstrated that some earlier determinations were too young.

The lesson is caution. Cave bones do not necessarily represent one living community, one hunting episode or even one generation. Carnivores may drag carcass parts into a den; flowing water, collapse, excavation and museum curation can further disturb their context. At Castlepook and neighbouring caves, remains of animals including reindeer, brown bear, hare, fox, wolf, woolly mammoth, giant deer and spotted hyaena document changing Ice Age faunas across a very long span. Re-dating suggests that giant deer and spotted hyaena may have disappeared locally before around 40,000 calibrated years ago. They should therefore not automatically be placed beside a reindeer at the later point represented by this article.

Reindeer are the most important animals for the present question. Their presence is compatible with open, cold landscapes and with movements through north-west Europe during favourable phases. But even a reindeer bone cannot, by itself, tell us whether herds were resident, seasonal visitors or represented a brief range expansion. The bones establish that Ireland was part of wider ecological networks, not that it possessed a stable or uniform animal population.

The Marked Reindeer Femur

Castlepook has acquired wider historical importance through one fragment of reindeer femur from the old collection. It has been reported as dating to about 33,000 years ago and bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made while fresh bone was being cut or chopped with a stone tool. If that interpretation is confirmed, it would be evidence that people handled and processed a reindeer in Ireland during the Upper Palaeolithic, many millennia before the well-established post-glacial settlement record.

“If” is indispensable. The fragment came from an old and disturbed cave assemblage rather than an excavated occupation floor. No stone tool has been found with it; nor is there a securely associated hearth, dwelling, human bone, butchered assemblage or stratified campsite. Recent work at Castlepook has sought intact deposits and further traces of activity, but the 2022 excavation also underlined the damage caused by early investigations and the scarcity of surviving undisturbed material. The femur is therefore a significant research prospect, not proof of a settled Palaeolithic population.

The older, better-published evidence for human presence is a cut-marked brown-bear kneecap from Alice and Gwendoline Cave in County Clare, directly dated to about 12,810–12,590 calibrated BP. That find is much later than 31,636 BCE, but it provides an important methodological contrast: it was independently dated and analysed in a focused peer-reviewed study. The Castlepook reindeer claim invites further testing to the same demanding standard. Responsible history should preserve the distinction between a compelling interpretation and a demonstrated occupation.

What Society Can, and Cannot, Be Seen

No known Irish house, camp surface, hearth, tool kit, grave, ornament, image or monument can securely be assigned to this interval. There is consequently no evidence for political authority, diplomacy, organised warfare, formal religious practice, farming, craft specialisation or trade within Ireland. There were no states, kingdoms or named peoples to describe. Conflict with animals or other people cannot be inferred from a marked bone, and hunting must not be recast as warfare.

If the Castlepook modification was made by people, the most economical interpretation is a brief encounter by mobile hunter-gatherers exploiting animal resources. Upper Palaeolithic communities elsewhere in Europe used stone tools, clothing, shelters and extensive social connections, but those facts are comparative context, not discoveries from Ireland. They cannot establish the language, identity, beliefs, numbers, route or duration of any visitors here. Nor can they show whether a group returned after one successful hunt. The word “settlement” is particularly misleading unless future excavations produce evidence of repeated or sustained occupation.

A Fragile Historical Horizon

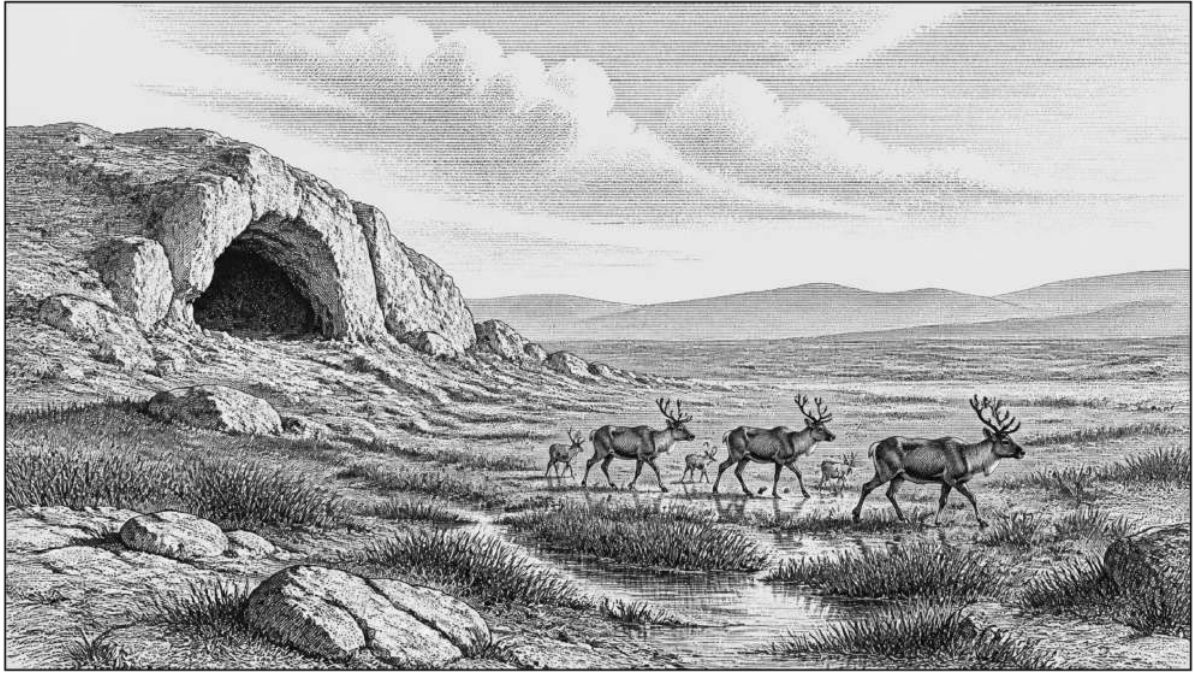
The economy visible in Ireland was ecological rather than agricultural: wild plants and animals, freshwater and seasonal opportunity shaped what was possible. There is no evidence for crops, livestock, pottery, metalworking or exchange of manufactured goods. Caves may have served carnivores more often than humans. A carcass processed in the open could have had parts carried into a cave by hyaenas or wolves, which is one reason the Castlepook evidence must be read with taphonomic care.

For this period, Ireland's history is therefore a history of evidence as much as of the past itself. Silts below a drumlin reveal a wet tundra landscape; calcite in a Kerry cave records episodes when water could drip and freeze-thaw conditions eased; bones from Cork caves disclose faunal change; one modified reindeer femur raises the possibility of a far earlier human presence than previously recognised. None supplies calendar-year precision. Together, they show an island—or a changing north-western peninsula and shelf landscape—at the edge of ice, intermittently habitable for cold-adapted life, and perhaps briefly reached by people whose story has almost entirely vanished.

Chapter 066 of 100

31635 BCE

The Doneraile Cutmark ^[66]



The label 31,635 BCE cannot denote an eventful Irish “year” in the ordinary historical sense. No written calendar, named people, settlements, rulers or dated acts survive from this depth of time. It is a modern chronological shorthand for a point roughly 33,500 years before AD 1950, within the Late Pleistocene. Even that conversion should not imply false precision: radiocarbon results are measurements with uncertainty, and must be calibrated against changing atmospheric carbon levels. For Ireland at this date, the responsible account is therefore one of broad archaeological phases, dated deposits and cautious interpretation rather than a year-by-year chronicle.

That broad setting was Marine Isotope Stage 3, a cold and climatically unstable part of the last glacial cycle. Ireland was not yet simply the uniformly ice-covered land associated with the later Last Glacial Maximum, generally dated in this region to roughly 27,000–19,000 years ago. Ice sheets, sea level, vegetation and animal ranges were all changing over long periods and differed considerably from place to place. The closest Irish evidence is not an occupation site with a date equivalent to 31,635 BCE, but cave-fauna collections in north County Cork and organic deposits preserved beneath later glacial sediments in County Fermanagh.

A Date Range, Not a Day

At this age, a calendar date is best treated as a filing device. Archaeologists normally report laboratory radiocarbon ages in BP, where “present” conventionally means AD 1950, and express their calendar equivalents as calibrated years BP or BCE. The calibration curve for the period beyond about 30,000 calendar years ago is based on several kinds of evidence—such as floating tree-ring sequences, cave mineral deposits, lake sediments and corals—not on a continuous annual record. Calibrated ranges can

consequently be broad or divided into several possible intervals. A specimen dated to a particular range need not have been deposited in the same season, decade or even century as another apparently nearby find.

There is an additional difficulty in Ireland. Later ice advance, erosion and sediment movement removed or disturbed many older land surfaces. The evidence that remains is patchy, and much of the best-known animal material was recovered by early twentieth-century excavators whose methods did not meet modern standards of stratigraphic recording. Re-dating and re-examining these museum collections has therefore been as important as digging new trenches. The result is a richer picture of Ice Age Ireland, but also a lesson in restraint: a bone can establish that an animal lived in the wider landscape; it cannot alone prove a human camp, a political territory or a continuous population.

Castlepook and the Reindeer Femur

The most consequential object for this period is a reindeer femur from Castlepook Cave, near Doneraile in north County Cork. Castlepook—long called Mammoth Cave because of its woolly mammoth remains—is a limestone cave system whose passages yielded a large and mixed Ice Age bone assemblage. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena are among the animals identified from the old collections. Their presence does not mean that all were alive together: individual bones have produced different ages, and carnivores, water movement and later disturbance could bring remains into the caves from outside.

County Cork heritage material places one particular reindeer bone at about 31,000 BCE. Ruth Carden's study of the femur identified a deep linear modification interpreted as a cut or chopping mark made on fresh bone by a sharp stone edge. If that specialist identification is accepted, it is potentially Ireland's earliest evidence of human activity: somebody used a lithic tool while processing a reindeer carcass during the Upper Palaeolithic. It is an important possibility, not a licence to invent an Irish hunting community with known customs or a permanent home.

The distinction matters. The radiocarbon determination dates the animal bone, while the interpretation of the incision concerns how the bone was modified. Neither result establishes whether people killed the animal, scavenged it, removed meat, hide, sinew or marrow, or worked elsewhere before the limb entered the cave. Early investigators believed that many carcass parts had been dragged into Castlepook by predators, especially hyaenas, wolves or bears. The cave is consequently better understood as a complex faunal and carnivore archive than as a demonstrated human dwelling. No securely associated stone tools, hearth, built shelter, human remains, grave, ornament or artwork has yet been published from Ireland for this horizon.

An Open, Cold Landscape

The creatures represented at Castlepook give the clearest impression of the country beyond its cave entrances. Reindeer and collared lemming suit cold, open ground; Arctic fox likewise points to severe conditions. Mammoth, giant deer, wolf, brown bear and spotted hyaena suggest a varied large-mammal community, not a modern Irish fauna transported intact into the past. It was an environment in which open herb-rich ground, sparse scrub, wet places and sheltered niches could exist in shifting proportions. "Tundra" is a useful shorthand, but not an exact map of every hillside and valley in the island.

Derryvree, near Maguiresbridge in County Fermanagh, offers a different kind of evidence. Road works cut through a drumlin there in 1969 and exposed freshwater silts and fine sands between glacial tills. The organic beds produced mosses, plant macrofossils and badly preserved pollen, alongside a radiocarbon result of 30,500 BP with a substantial error range. Researchers interpreted the assemblage as open tundra vegetation in a periglacial climate: a treeless, wet ground surface with sedges, mosses and cold-adapted plants, rather than forest. Such deposits are not a diary of north Cork, and their older radiocarbon measurement cannot be equated mechanically with 31,635 BCE. They do, however, independently show that parts of Ireland could support cold open wetlands during the Middle Midlandian phase of the last glaciation.

Plant evidence also corrects a simple picture of lifeless frozen ground. Derryvree's fossil flora included aquatic and wetland plants, and its moss record indicates local freshwater habitats. Waterlogged hollows, shallow pools and sedge-rich margins would have been significant to insects, small mammals and herbivores, as well as to predators following them. Seasonal snow, frost action and permafrost processes altered soils and drainage. The landscapes visible in modern Ireland—deep peatlands, enclosed farms, broad woodland patches and familiar shorelines—belong to much later environmental histories.

Routes Across a Changing Northwest

Ireland's present insularity must not be projected uncritically into this period. Global sea level was lower during the glacial cycle because much water was stored in ice sheets, exposing areas that are now seabed. Yet the geography of passage between Ireland, Britain and continental Europe depended not only on eustatic sea level but on local crustal movement, ice extent and the configuration of the Irish Sea basin. Scholarship continues to debate precisely when, where and whether a fully dry land bridge existed. It is safest to say that the distances and barriers were different, and that animal movement into Ireland was demonstrably possible, rather than draw a confident migration road across a modern map.

For any people represented by the Castlepook cutmark, mobility is the most defensible inference. Upper Palaeolithic groups elsewhere in north-west Europe used stone tools, planned movements through seasonal landscapes and drew resources from animal herds, plants and waterways. The Irish femur may fit such a world of brief forays or passing parties. But there is no direct Irish evidence at this date for the size of a group, language, kinship system, exchange network or the recurrence of visits. Trade cannot be demonstrated; neither can diplomacy, territorial rule or organised conflict. A sharp tool mark on one limb bone records an action, not a society in full view.

Human Worlds Beyond the Evidence

It would be equally misleading to imagine that any Upper Palaeolithic visitors lacked culture, learning or belief. People capable of travelling through Ice Age north-west Europe and making effective stone tools necessarily possessed practical knowledge: animal behaviour, raw materials, safe routes, weather, food preparation and cooperation. Their wider European contemporaries made distinctive tools, personal ornaments and images in some regions. None of those findings can, however, be transferred automatically to Ireland. At present there is no Irish evidence from around this horizon for ritual practice, burial, music, art, formal teaching places or symbolic objects.

The political history of Ireland in 31,635 BCE is therefore not a hidden sequence of chiefs and battles awaiting recovery. It is an era before political institutions can be recognised archaeologically on the island. The meaningful historical development is environmental opportunity and constraint: a cold,

changing land inhabited by large mammals and carnivores, reached at least intermittently by fauna from the wider north-west European world, and perhaps briefly visited by people. The Castlepook reindeer femur makes that final possibility unusually vivid. Its single marked surface is small evidence, but it directs future research towards the places where a firmer human story might one day be found.

What Can Be Said Securely

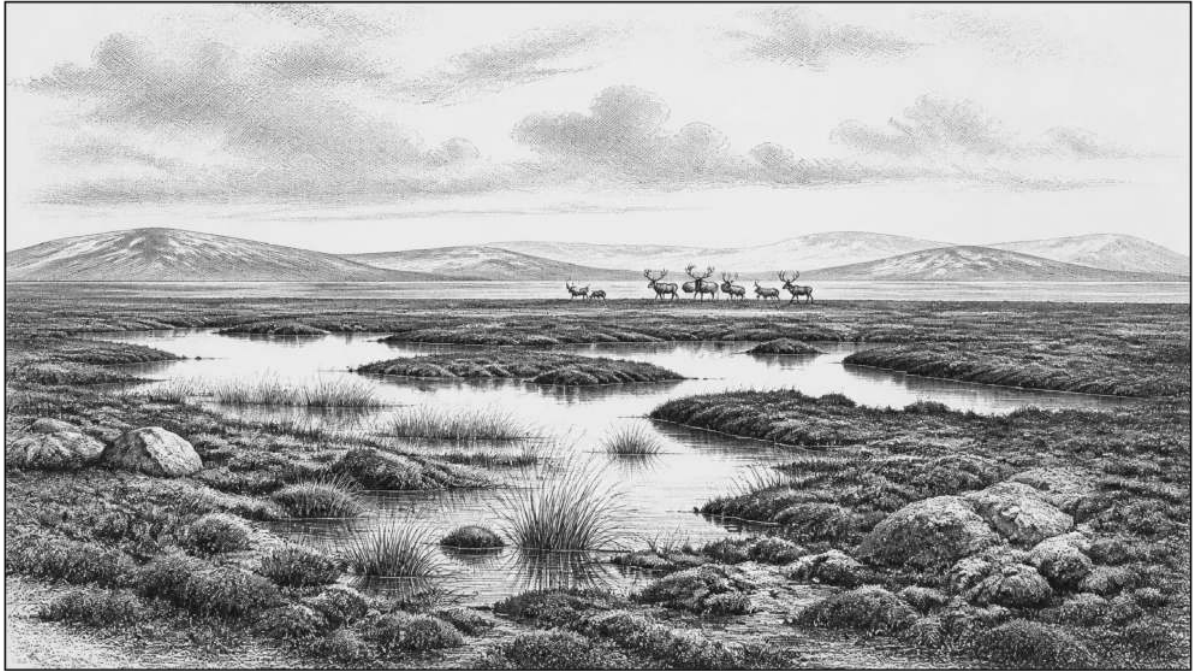
For the broad period denoted by 31,635 BCE, Ireland was part of an Ice Age world, not a settled island with recoverable named communities. Cave bones establish the presence of a cold-adapted and large-mammal fauna in southern Ireland across parts of Marine Isotope Stage 3. Derryvree's buried freshwater sediments document cold, treeless wetland conditions in Fermanagh during the wider Middle Midlandian record. The Castlepook femur provides a plausible, potentially transformative sign that a person used a stone edge on a reindeer bone around this broad timeframe. Its interpretation remains narrower than claims of permanent colonisation.

That uncertainty is not a failure of Irish history. It is the proper scale of the surviving record. Each newly dated bone, reanalysed collection and intact sediment layer can alter the picture. Until then, the most accurate account of this notional year is a landscape of open cold ground, wet hollows and limestone caves; reindeer and predators moving through it; and one enigmatic incision that may preserve Ireland's earliest known human gesture.

Chapter 067 of 100

31634 BCE

Fermanagh's Inter-Till World ^[67]



A Date Beyond Annual History

31,634 BCE is not a year that can be recovered from Ireland's archaeological record in the ordinary historical sense. No one on the island used a calendar capable of naming it, and no surviving deposit can distinguish what happened in one particular year so far back. Expressed in the conventions used by Quaternary scientists, it is approximately 33,600 calibrated years before present, where "present" means AD 1950. That places it in the Late Pleistocene, within Marine Isotope Stage 3: an unstable stretch of the last Ice Age, long before the last great expansion of the British-Irish Ice Sheet.

Consequently, this is not a year for kings, battles, treaties, farms or monuments. There are no securely dated Irish settlements, hearths, graves, stone-tool scatters, artworks or human remains that belong to this precise horizon. The responsible history of Ireland at this depth is instead an environmental and archaeological reconstruction: one assembled from freshwater sediments buried below glacial deposits, cave-bone collections, radiocarbon determinations, pollen, plant remains, insects and the marks left by ice. Its central lesson is not that the island was empty beyond doubt, but that the available evidence is too sparse to identify a settled human population.

Between Two Advances of Ice

The most illuminating Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road-cutting in 1969 exposed fine sands and organic freshwater silts trapped between two thick tills, the unsorted debris laid down by separate ice advances. The deposit was therefore a rare

surviving interval from a landscape that ice later buried and reshaped. A radiocarbon determination, Birm-166, returned an age of 30,500 radiocarbon years BP, with a substantial laboratory uncertainty. Calibration gives a broad range of roughly 36,900–31,700 cal BP, approximately 34,950–29,750 BCE.

That range encompasses 31,634 BCE, but it does not date the sediment to that single year. It establishes that north-central Ireland was ice-free during part of this broad interval, and that a freshwater environment existed before a later ice advance. The lower till tells of earlier glaciation; the upper till records subsequent overriding ice. Between them lies evidence for a cold but living landscape. This is a valuable corrective to any picture of Ice Age Ireland as permanently sealed beneath a uniform ice cap.

Derryvree also reveals the limits of regional certainty. A deposit in Fermanagh cannot provide a weather report for Cork, Galway or the Irish Sea basin in a specified year. Glaciers, sea level, vegetation and animal ranges responded differently across a varied western fringe of Europe. Yet the sequence does demonstrate that, around the general timespan represented by this modern date, Ireland could include exposed ground, standing or slow-moving freshwater, and habitats suitable for specialised cold-climate life.

Muskeg, Pools and Open Tundra

The biological remains at Derryvree point to a treeless tundra or muskeg environment. Mosses, herbaceous pollen, plant macrofossils and insect evidence indicate wet ground with shallow pools, mossy margins and abundant decaying vegetation, rather than woodland. Finds include plants associated with cold, open places, among them mountain avens, lesser clubmoss and bogbean. The result is an unexpectedly detailed glimpse of a lost Irish habitat: sedge-rich, waterlogged patches within a broader periglacial terrain, where frost action and seasonal thaw influenced the ground.

This was not necessarily a featureless white wilderness. “Tundra” covers varied micro-environments: wet hollows, mineral banks, gravelly ground, exposed slopes and stream edges could support different plants. Summers were sufficient for growth, insects and freshwater productivity, while winters were harsh. The surviving evidence does not permit reliable estimates of annual temperature or snowfall for 31,634 BCE itself. It does, however, support an open landscape very unlike the densely wooded Ireland of later millennia.

Crag Cave in County Kerry adds a different kind of climatic archive. Its speleothems, or cave calcites, formed only during episodes when liquid water could circulate through the shallow cave system. Uranium-series dating shows that calcite deposition in south-west Ireland was episodic during Marine Isotope Stage 3, matching wider North Atlantic climatic fluctuations broadly associated with Greenland interstadials. This does not prove that every part of Ireland became mild, nor does it give an annual chronology. It does show that the Ice Age climate at Ireland’s Atlantic edge repeatedly shifted, creating intermittent windows more favourable to water flow, vegetation and animal movement.

Animals at the Western Edge

Castlepook Cave, near Doneraile in north County Cork, supplies the principal faunal comparison. Its old collections and more recent investigations have produced remains of woolly mammoth, reindeer, spotted hyaena, brown bear, giant deer, arctic fox, hare, lemmings, wolf and other animals. They do not all belong to one moment. Cave deposits were disturbed by water, excavation and later re-sorting, while

different bones have yielded dates spread across many thousands of years. Nevertheless, the assemblage establishes that Ireland was at times part of a wider north-west European zone in which large herbivores and predators could reach the western edge of the continent.

Some Castlepook bones have radiocarbon ages broadly relevant to the period under discussion. Earlier dating programmes placed mammoth, hyaena, reindeer, bear and giant deer in pre-Last Glacial Maximum phases; modern reassessment has stressed that older bone dates require careful treatment and that cave contexts are complex. The secure conclusion is ecological rather than dramatic: animals conventionally associated with cold open country were present in Ireland during parts of Marine Isotope Stage 3. Their presence implies routes into Ireland across landscapes and seaways then very different from those of today, but it cannot on its own map a single migration route or prove a continuously connected land bridge.

Predators complicate the picture further. A cave may have been a den, a natural trap, a refuge, a place where water concentrated bones, or several of these at different times. Hyaena teeth, coprolites or gnawed bones would reflect carnivore behaviour; an isolated mammoth element might record scavenging, transport or accidental deposition. The cave fauna therefore documents food webs and movement, not a neat census of animals living together in one valley. It is tempting to imagine mammoths, reindeer and hyaenas sharing one scene, but the evidence supports repeated episodes across a long interval rather than a single reconstructed day.

The Human Question

The most consequential, and most debated, artefact-like evidence is a reindeer femur from Castlepook bearing a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made with a sharp stone tool during carcass processing. The bone has been publicised as dating to around 33,000 years ago, making it broadly comparable with the late Ice Age world represented by this article. If the modification is confirmed as anthropogenic, it would be evidence that one or more Upper Palaeolithic people handled a reindeer carcass in Ireland far earlier than the long-established post-glacial archaeological record.

Its implications must remain narrow. The date measures the age of the animal's death, not automatically the date of the incision, the location of its killing, or the length of a human visit. The specimen came from an old collection, not from a newly excavated occupation floor with associated tools and a hearth. No securely linked dwelling, burial, repeated camp, artistic object or stone-tool assemblage has yet been found. Renewed excavation and survey at Castlepook have identified surviving Pleistocene deposits and may eventually clarify the cave's chronology, but potential evidence of butchery is not evidence for permanent settlement.

For this reason, political affairs, diplomacy and organised conflict cannot responsibly be described. There is no basis for assigning language, kinship structure, leadership, belief or territorial ownership to people in Ireland at this date. If small hunting parties did arrive during favourable environmental windows, they may have been mobile foragers comparable in broad economic practice to Upper Palaeolithic groups elsewhere in Europe. But that is an interpretation drawn from wider European archaeology, not a demonstrated Irish social history. Ireland provides no direct evidence that such visitors formed a resident community, exchanged goods through durable networks, or left descendants on the island.

Connectivity Without Continuity

Lower global sea levels altered the geography of north-west Europe, exposing portions of the continental shelf and narrowing or changing water barriers. Faunal evidence and, more recently, sedimentary ancient-DNA work at Castlepook support the view that Irish animal populations were connected to wider Eurasian populations before the Last Glacial Maximum. This is best understood as biogeographical connectivity: animals could disperse through changing coastal and terrestrial corridors over long periods. It should not be simplified into a claim that Ireland was permanently joined to Britain, or that any particular route was open in 31,634 BCE.

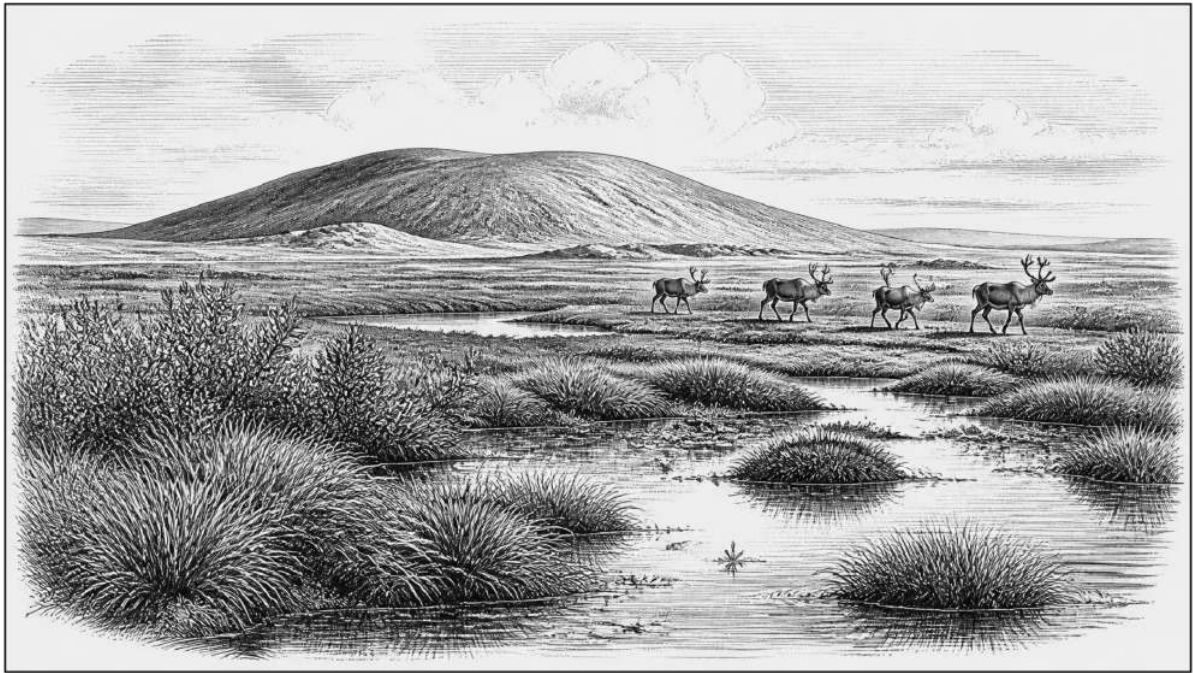
The approach of the Last Glacial Maximum would later transform the situation. Research on the British–Irish Ice Sheet places its maximum expansion substantially later, broadly around 26,000–19,000 years ago, although individual sectors advanced and retreated at different times. At 31,634 BCE, the Derryvree evidence belongs to an earlier, fluctuating world: not yet the island-wide landscape most thoroughly overwritten by late glacial ice, but already one shaped by severe cold, unstable margins and environmental change.

Thus the most important development around this notional year was neither a recorded human event nor an Irish polity. It was the existence, during a broad scientifically dated interval, of habitable cold-country environments between glacial episodes. Fermanagh's buried freshwater silts preserve their vegetation and invertebrates; Cork's caves preserve fragments of a wider animal world and a possible human trace. Together they make Ireland visible at the edge of deep time, while also insisting on intellectual restraint. The evidence is real, but annual precision, continuous occupation and the familiar institutions of history remain beyond its reach.

Chapter 068 of 100

31633 BCE

Beneath Maguiresbridge Drumlin^[68]



The label 31,633 BCE is a modern way of indexing deep time, not a year that anyone in Ireland could have named or recorded. It corresponds only approximately to 33,600 calibrated years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3. At this distance, archaeology cannot offer calendar-year precision: radiocarbon results must be calibrated, their ranges can be broad, and deposits often represent periods rather than single moments. The responsible task is therefore to describe the evidence relevant to Ireland around this horizon, rather than invent an event for a particular year.

A Changing Ice-Age Island

Ireland lay within the climatic world of the last Ice Age, but it was not yet simply an island buried beneath the ice sheet familiar from later reconstructions of the Last Glacial Maximum. The British–Irish Ice Sheet grew and altered over long timescales, with its most extensive late-glacial phase occurring substantially later, broadly after c. 27,000 calibrated years BP. A modern reconstruction places a major phase of ice-sheet growth between about 31,000 and 26,000 years BP, followed by maximum volume around 23,000 years BP. The numerical date represented by 31,633 BCE therefore belongs to an earlier and unstable interval, when conditions, ice margins and habitats could change greatly across centuries and millennia.

The best evidence does not permit a single map of Ireland for this particular year. Later glaciers eroded, redeposited and buried much of the earlier landscape. Yet surviving sediments show that parts of the island had ice-free ground during sections of this period. In County Fermanagh and County Antrim, organic layers, freshwater silts and sands occur between separate sheets of till, the stony sediment laid

down by moving ice. Their sequence records an important environmental rhythm: an earlier advance of ice, an interval in which water, plants and animals occupied the land, and a later glacial advance that sealed much of the evidence.

Freshwater Under Later Ice

At Derryvree, near Maguiresbridge in County Fermanagh, roadworks exposed such an archive inside a drumlin. Freshwater silts and fine sands, rich in organic material, lay between two distinct tills. The order of these deposits is more secure than any attempt to squeeze their history into a precise calendar date. It demonstrates that, before later ice covered the locality, there was a non-glacial freshwater setting in north-central Ireland. The site's conventional radiocarbon determination of about 30,500 BP carries a large uncertainty; when calibration is considered, it has been discussed as broadly relevant to c. 36,900–31,700 calibrated years BP. That is a wide interval, but it includes the approximate horizon denoted by 31,633 BCE.

The Derryvree evidence is unusually vivid. Plant remains, mosses, pollen and insects indicate a cold, largely treeless landscape, not the densely green and wooded Ireland of much later prehistory. Sedges, bogbean, dwarf willow and mountain avens point to wet hollows, shallow freshwater and open tundra-like ground. Seasonal thaw would have created pools and saturated margins, while severe winter frost shaped soils and restricted the growing season. Occasional tree pollen should not be treated as proof of local woodland: pollen can travel over considerable distances, and the wider assemblage supports open country. This was not an empty, uniform expanse of snow, but a patchwork of water, marsh, herb-rich ground and exposed mineral soil.

Nearby records reinforce the wider point while also showing why caution matters. Organic deposits at Hollymount and Greenagho in Fermanagh suggest cold, non-glacial phases during the Middle Midlandian, the Irish regional term often used for this part of the Devensian glaciation. But dates can be minimum ages, samples may be difficult to correlate, and one locality cannot automatically speak for every valley or coast. At Aghnadarragh beside Lough Neagh in County Antrim, a remarkable succession preserves tills, peats, water-laid sediments and a gravel horizon containing woolly mammoth remains. Together, these sites establish regional environmental change; they do not provide a weather report for all Ireland in 31,633 BCE.

Castlepook's Animal Archive

For animal life, the key Irish site is Castlepook Cave near Doneraile in north Cork. Its limestone galleries have yielded more than 2,000 bones and remain Ireland's richest known vertebrate archive for the long period leading towards the Last Glacial Maximum. Radiocarbon dating of individual bones has shown that the collection spans a considerable duration, rather than a single occupation or a single ecosystem. The material includes woolly mammoth, giant deer, reindeer, brown bear, wolf, fox, hare, lemmings and the only securely recorded Irish Ice-Age spotted hyaenas. These animals should not be imagined as standing together at one moment outside the cave entrance. The assemblage accumulated over many thousands of years and was affected by scavengers, natural deaths and the movement of bones within a complicated cave system.

Nonetheless, Castlepook makes the broader ecological setting intelligible. Reindeer, hares and lemmings are consistent with open, cold habitats. Mammoth and giant deer evoke a productive but harsh mosaic in which grazing and browsing animals could exploit seasonal vegetation. Hyaenas and wolves

indicate predators and scavengers capable of transporting carcass parts into sheltered spaces. The cave itself was not necessarily a human dwelling, a hyaena den or an animal trap at every stage of its history; its significance lies in the accumulated record of changing faunas. Reassessment of old radiocarbon samples has been essential, since early cave excavations disturbed deposits and older dates sometimes required improved pretreatment and redating.

The Earliest Human Question

Castlepook also raises the most tantalising question for Irish history at this date: were people present? A reindeer femur from the cave, recovered in the twentieth-century excavations and reported in 2021, has been dated to about 33,000 years ago. Zoologist Ruth Carden interpreted a deep incision on it as a mark made by a sharp stone tool during butchery. If that interpretation is sustained, it would indicate that Upper Palaeolithic people processed a reindeer in Ireland far earlier than the previously accepted evidence for human activity on the island.

The qualification is crucial. The radiocarbon result dates the animal bone, not automatically the cutting episode; a mark on a surface must be distinguished from damage caused by carnivores, sediment, excavation or later handling. No securely associated stone tools, hearth, shelter floor, butchered assemblage or human remains have yet been found at Castlepook to establish a settlement. Recent licensed excavations have sought undisturbed Pleistocene deposits precisely because the old collection, though invaluable, cannot answer every question about context. The femur is best regarded as important but contested evidence of possible human presence, not as proof of a resident Irish population in 31,633 BCE.

What Society Cannot Yet Be Seen

There is no basis for describing political affairs, rulers, tribes, diplomacy, territories or organised warfare in Ireland at this date. No written language existed locally, and the archaeological evidence does not identify a named community. Equally, there is no direct Irish evidence for religious ceremony, burial practice, art, schooling, exchange networks or a domestic economy. The word “Ireland” is useful geographically, but it should not imply a country, people or cultural tradition continuous with later Gaelic society.

If people did visit the island during this phase, the most cautious inference is that they would have been highly mobile hunter-gatherers, probably moving through a broader north-west European world in which animal migrations, weather, raw materials and safe routes governed decisions. Such groups elsewhere used stone tools, shared knowledge through oral teaching and maintained social ties across considerable distances. But these are comparisons with the Upper Palaeolithic of Europe, not observations of an excavated Irish camp. They cannot demonstrate whether people came once, repeatedly, seasonally or not at all.

Mobility, Not Trade

Nor should the movement of animals and possible visitors be called “trade”. The evidence supports natural colonisation and dispersal during windows when climate and geography permitted, rather than documented exchange between communities. Lower sea levels altered coastlines and may have reduced or

changed water barriers, but the precise availability of routes between Ireland, Britain and continental Europe varied through time. Any human crossing would have required knowledge, planning and favourable conditions; it cannot be reconstructed from the Castlepook bone alone.

The principal story illuminated by 31,633 BCE is therefore environmental opportunity and vulnerability. Freshwater wetlands survived in some ice-free districts. Cold-adapted plants and mammals used open landscapes. Cave deposits in Cork preserved fragments of a wider faunal world, while Fermanagh sediments retained a rare record of water and vegetation later buried by ice. Human activity is possible, and one specimen may eventually alter the accepted beginning of Irish prehistory, but it remains an interpretation being tested rather than a settled fact.

For this year, then, Ireland cannot responsibly be given a king, a battle or a founding event. Its history lies in silt under a drumlin, in seeds and insect remains from a frost-affected wetland, and in animal bones gathered in a north Cork cave. Those traces reveal a landscape on the threshold of major glacial change: inhabited certainly by wildlife, intermittently habitable for people, and still far beyond the reach of calendar history.

Chapter 069 of 100

31632 BCE

Castlepook's Stadial Fauna ^[69]



The label 31,632 BCE should not be mistaken for a date at which Irish prehistory can be read like an annal. No written record, settlement sequence or archaeological deposit can identify an event in that individual year. In modern chronological terms it is approximately 33,581 years before 1950, during the Middle Midlandian portion of Ireland's last glacial cycle and within Marine Isotope Stage 3. At this depth of time, radiocarbon results require calibration and retain wide uncertainties; the responsible subject is therefore Ireland in the broad interval around the nominal date, not an invented episode on a particular day.

There is, however, an extraordinary Irish archive for this part of the Ice Age. At Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, caves preserved bones from animals that occupied or reached Ireland long before the island's documented human settlement. Together with a freshwater deposit beneath a drumlin at Derryvree near Maguiresbridge, County Fermanagh, and with the changing record of ice, sea and sediments around the island, these remains allow a cautious reconstruction of an Ireland radically unlike the later wooded and inhabited country.

A Date Without a Calendar

Radiocarbon laboratories conventionally report ages in years "before present", where "present" means 1950, not the current year. Such measurements are not direct calendar dates, because atmospheric carbon-14 has varied through time. The internationally used IntCal20 curve converts radiocarbon measurements into probability ranges in calendar years before 1950. At c. 30,000–40,000 years ago, those ranges may be broad and may contain more than one plausible interval. A single BCE label is consequently useful for ordering a long chronology, but it has a precision that the evidence itself does not possess.

The same caution applies to climatic terminology. On the Greenland ice-core chronology, a date roughly equivalent to 31,632 BCE falls close to Greenland Stadial 6, conventionally dated from about 33,740 to 33,360 years before AD 2000. That identifies a cold phase in a high-resolution Greenland record, not a weather report from Cork or Fermanagh. North Atlantic changes strongly affected Ireland, but local landscapes responded through ice growth, wind, precipitation, vegetation, drainage and sea level in ways that need independent Irish evidence.

The Island at the Edge of Ice

Ireland lay in the outer zone of the British–Irish Ice Sheet system. It had experienced repeated glacial advances and retreats through the Quaternary, and its present relief was already being reshaped by ice, meltwater, frost action and sediment movement. The vast maximum of the last ice sheet came later, broadly between 26,000 and 19,000 years ago, though the timing and thickness of ice differed markedly between regions. The latest large-scale reconstructions show that the ice sheet's growth and decay were neither simple nor simultaneous around its margins.

For the interval around this article's nominal date, certainty is lower. Recent synthesis indicates substantial pre-Last Glacial Maximum ice growth somewhere in the British–Irish system, while Irish land evidence is patchy, often overrun or obscured by later ice. It would be wrong to portray every valley as sealed beneath a uniform cap. Equally, it would be wrong to imagine a wholly open Ireland awaiting colonists. The strongest inference is a climatically severe and unstable setting in which ice margins, exposed ground and periglacial terrain changed over millennial rather than annual timescales.

Lower global sea levels exposed much more of the continental shelf than survives above water today. Yet a lowered sea is not automatically a dry, walkable land bridge, and glacial ice, marine channels and shifting coastlines complicate every route. The presence of large mammals in Ireland demonstrates some form of faunal connection with Britain and north-western Europe at intervals during the Late Pleistocene. It does not by itself reveal precisely where, when or whether each population crossed on dry ground, coastal margins, seasonal ice or a changing mosaic of these conditions.

Derryvree's Treeless Wetland

The most informative inland environmental record comes from Derryvree, two kilometres north-east of Maguiresbridge in south Fermanagh. Road works in 1969 exposed fine sands and freshwater silts enclosed between glacial tills within a drumlin. Organic material from the deposit produced a conventional radiocarbon determination of $30,500 \pm 1,100$ years BP. That result is not interchangeable with 30,500 calendar years ago; calibrated equivalents are substantially older and uncertain. Nonetheless, the deposit securely belongs to the wider cold-stage world relevant to the nominal year.

Its plant and animal remains indicate open tundra and periglacial conditions. Pollen was poorly preserved but was predominantly herbaceous. Macrofossils included mosses and plants such as bogbean, mountain avens and alternate water-milfoil. These are not evidence for a modern Irish bog or a continuous carpet of the same species across the island. They document a particular freshwater or wet-ground habitat, surrounded by sparse, treeless vegetation, and show that cold-stage Ireland contained local pools, sedge-rich ground and sheltered ecological niches rather than only barren ice.

The word *muskeg*, used by researchers for the Derryvree environment, conveys waterlogged, mossy tundra ground. It should be understood as a comparison, not as a map of the whole island. Uplands, limestone country, river corridors and coasts would have offered different surfaces and vegetation. Sparse

cover also meant exposed mineral soils and sediments were vulnerable to frost heave, wind and meltwater. The familiar later ingredients of Ireland's landscape—dense temperate woodland, deep blanket peat, fields, hedges and villages—belonged to vastly later worlds.

The Cave Bone Archive

Castlepook gives this remote era its most vivid Irish evidence. Excavations from 1904 to 1918 recovered more than 2,000 bones from narrow limestone galleries and chambers given evocative names including Hyenahall and Elephant Hall. The cave was a repository, not a neatly sealed snapshot: water disturbance, old excavation methods and deposits of different ages mean that bones cannot simply be assembled into one simultaneous herd. Modern dating and re-dating have therefore been essential.

The assemblage demonstrates that Ireland supported, or was visited by, a remarkable Late Pleistocene fauna. Identified remains include woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; other levels have yielded wolf, Arctic fox, mountain hare, collared lemming and Norway lemming. The combination is powerful evidence for cold, open-country ecological connections. Mammoths and giant deer required substantial food resources; reindeer and lemmings point towards northern or tundra-like conditions; hyaenas indicate a carnivore capable of transporting and chewing bones into a den.

But the bone collection must not be treated as a census. A bone may record an animal's death, scavenging or transport into the cave, rather than a local breeding population. Some species are represented by few specimens. New radiocarbon work has also shown that several earlier dates on southern Irish cave bones were too young because older techniques could not always remove contamination adequately. That reassessment suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 calibrated years BP. The evidence is thus strongest for a long and changing Middle-to-Late Pleistocene faunal history, not for a precise animal encounter in 31,632 BCE.

Food Webs, Not an Economy

There was no Irish economy in the human sense that can be described for this date: no proven farm, market, craft industry, field system, mine, harbour or trading community. What the evidence does reveal is an animal economy of grazing, browsing, predation and scavenging. Herbivores converted sparse vegetation into meat; wolves and hyaenas competed or scavenged; cave deposits preserved traces of those relationships. The gnawed and accumulated bones at Castlepook make the hyaena especially important, not as an exotic curiosity but as an agent that shaped the archive archaeologists now study.

There is likewise no responsible evidence for Irish political affairs, diplomacy, warfare, religious practice, language, art, formal learning or human settlement at this date. These absences matter. They prevent the misleading transfer of later prehistoric categories—tribes, chiefs, rituals or trade routes—into a period where the record is chiefly geological and palaeontological.

The Human Question

Claims for very early people in Ireland require particular restraint. The National Museum of Ireland has long noted the absence of clear Palaeolithic evidence for human presence on the island. A bear kneecap from Alice and Gwendoline Cave, County Clare, dated to about 10,800–10,500 BCE, has been interpreted as bearing fresh-bone stone-tool cut marks. This is thousands of years later than the date

considered here. Reports have also drawn attention to possible marks on a Castlepook reindeer bone, but a marked bone alone cannot establish a securely dated settlement, hearth, toolkit, dwelling or enduring population.

Accordingly, the most defensible picture around 31,632 BCE is not one of known Ice Age Irish hunters pursuing mammoth or reindeer. It is an Ireland whose caves and wetlands record animal movements and cold-climate habitats, while direct human evidence remains absent or disputed. If people ever entered the island in this broader period, surviving archaeology has not yet demonstrated their lives with the clarity required to describe society or events.

What This Landscape Bequeathed

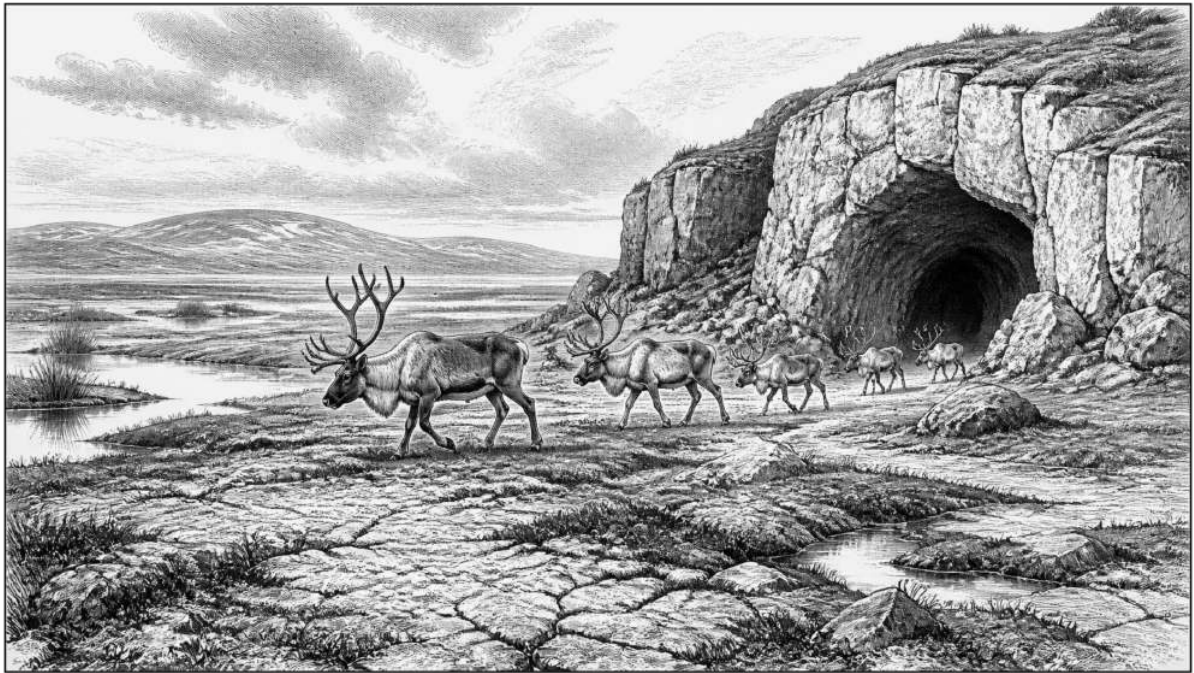
The importance of this interval lies in its deep legacy. Glacial erosion and deposition helped prepare the ground on which later rivers, lakes, soils and wetlands developed. Drumlins in Fermanagh, caves in Cork and sediments on the surrounding seabed are not merely scenery or scientific curiosities: they are archives of former climates and vanished animal communities. They show that Ireland's apparently familiar island environment was repeatedly reconfigured before people made their durable mark upon it.

For 31,632 BCE, then, the truthful history is one of qualified knowledge. A cold North Atlantic world, changing ice margins, treeless wetland in south Fermanagh and the long-lived faunal archive of Castlepook can be supported by evidence. A named year, a human leader, a battle, a ritual or a settlement cannot. Respecting that distinction makes the period more compelling, not less: beneath later Ireland lies a dynamic Pleistocene country of frost, water, open ground and animals now absent from the island.

Chapter 070 of 100

31631 BCE

Rangifer at Doneraile^[70]



The label 31,631 BCE is a modern chronological convenience, not a year that anybody in Ireland could have named or recorded. At this depth of time, apparent calendar precision is misleading: the date falls roughly 33,600 calendar years before AD 1950, but archaeology and palaeoclimate research work with ranges, uncertainties and correlations rather than a single season or event. The most responsible setting is the later part of Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. For Ireland, the evidence consists chiefly of animal bones, cave deposits, buried freshwater sediments, glacial landforms and radiocarbon measurements. It does not supply a political narrative, a named population or a map of settlement.

A Landscape Before Maximum Ice

At this broad horizon, Ireland was approaching the major expansion of the last Irish Ice Sheet, but was not yet necessarily engulfed by the continuous ice cover associated with the Last Glacial Maximum. Syntheses of glacial evidence suggest that much of Ireland may have remained ice-free until about 32,000 calendar years ago, after which ice thickened and spread across the island's uplands. That conclusion is itself a reconstruction, not a photograph of one moment. Ice growth was spatially uneven, and the evidence is better for some districts than for others. The later maximum, conventionally dated to about 27,000–23,000 calibrated years before present, would radically rework landscapes and destroy or disturb older deposits.

The Ireland of this period was consequently neither the familiar green island nor simply an unbroken white ice sheet. Open, cold country could occur beyond advancing ice margins: a periglacial world of frost-shattered ground, sparse vegetation, seasonal meltwater and exposed mineral soils. Sea levels were lower than today because vast quantities of water were stored in northern ice sheets. Yet it would be

careless to turn that fact into a confident picture of an easy land bridge from Ireland to Britain or continental Europe. The changing shape of ice, sea and shallow shelf created complicated routes and barriers. Any human or animal movement into Ireland depended upon conditions that are not recoverable in year-by-year detail.

Castlepook's Faunal Archive

The clearest Irish evidence relevant to this distant period comes from Castlepook Cave, near Doneraile in north County Cork, also known as Mammoth Cave. Its limestone passages yielded more than two thousand bones during excavations in the early twentieth century. Later radiocarbon work has shown that the assemblage spans a long interval, with dated individual remains falling broadly between about 45,700 and 19,950 years before present. The cave is therefore not a single event deposit. It is a time-averaged archive formed through repeated animal deaths, carnivore activity, sediment movement and later disturbance.

Nevertheless, Castlepook demonstrates beyond doubt that large mammals occupied southern Ireland during MIS 3. Its fauna includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, alongside smaller cold-adapted animals in later deposits. This is significant evidence for an Ice Age ecological community, but each species must be interpreted carefully. A bone in a cave need not mean that the animal lived there permanently; hyaenas and other carnivores could carry prey or scavenged carcass parts underground. Water could also redistribute material. The cave shows a regional faunal landscape, not a neat census of a single valley.

Reindeer are especially important for the date in question. They are well suited to open northern environments and their presence fits an interpretation of broad, treeless terrain rather than closed woodland. Mammoth and giant deer likewise point towards a richer large-mammal fauna than historic Ireland possessed. Spotted hyaena is a reminder that the cave itself could have been part of a carnivore's territory. Such animals were not merely background scenery for possible people; they were competitors, scavengers and hazards within an ecosystem structured by mobility, weather and seasonal resources.

The Reindeer Femur and Human Possibility

One Castlepook reindeer femur has altered discussion of Ireland's earliest human past. The bone has been reported as about 33,000 years old and bears a deep mark interpreted by the palaeozoologist Ruth Carden as an incision made on fresh bone with a sharp stone implement, probably during butchery. If that diagnosis is sustained, it is evidence that people reached Ireland during MIS 3, many millennia before the better-established post-glacial occupation of the island. It is an arresting possibility precisely because the Irish Palaeolithic record is so slight.

The distinction between evidence and interpretation matters here. The directly dated reindeer bone is evidence. The mark on it is evidence. Its identification as a human-made cut or chop mark is a specialist taphonomic interpretation, assessed from its form, depth and position rather than assumed from its existence. No securely associated stone tool, hearth, dwelling floor, human skeleton or stratified camp has yet been tied to that one act at Castlepook. The femur therefore supports a cautious claim of human activity or visitation, not proof of a settled population, a named culture, or continuous occupation across Ireland.

Nor can the bone tell us whether the person who made the mark was a recent arrival, how many companions were present, or whether the animal had been hunted rather than found dead or scavenged. Butchery of a carcass could have yielded meat, marrow, hide, sinew and bone; these are reasonable possibilities, not recoverable facts in this instance. A sharp stone edge would imply practical lithic knowledge, but the tool itself is absent. The scale of the evidence should govern the scale of the story: Castlepook permits a glimpse of a human encounter with an animal, not a reconstruction of a village.

Fermanagh's Buried Wetland

Environmental evidence from Derryvree near Maguiresbridge, County Fermanagh, helps to illuminate the wider Irish world, although it cannot be assigned precisely to 31,631 BCE. There, a freshwater series of silts and fine sands was found between two thick till sheets within a drumlin. Radiocarbon determinations centred on about 30,500 radiocarbon years before present, with substantial uncertainty; calibration places the deposit broadly in the same later MIS 3 environmental neighbourhood, measured in millennia rather than years. The stratigraphy is valuable because the sediments survived between advances of ice that later reshaped the region.

Plant macrofossils, pollen, insects and mosses from Derryvree indicate a cold, open, treeless wetland or muskeg landscape. Sedges, dwarf shrubs and herbaceous tundra plants, with shallow pools and waterlogged ground, supplied the material record. The picture is not of empty frozen desert. It is of a harsh but biologically active mosaic in which vegetation varied with drainage, snow cover, exposure and the short growing season. The evidence is local to the basin, however. It should not be inflated into a uniform description of every part of Ireland, still less a claim that Castlepook and Derryvree were occupied simultaneously.

Life Without Institutions

There is no evidence from Ireland at this date for political institutions, warfare, diplomacy, formal religion, writing, monuments or long-distance trade networks. Those subjects cannot responsibly be filled with imagined chieftains, rituals or tribal territories. If humans were present, their social world was more likely organised through small, mobile foraging groups than permanent settlements, as is broadly consistent with Upper Palaeolithic lifeways elsewhere in north-west Europe. But that is comparative interpretation, not a fact demonstrated by an excavated Irish camp.

Everyday survival would have required extensive environmental knowledge: reading animal movements, finding shelter, managing warmth and maintaining portable tools in a severe climate. Caves such as Castlepook could offer temporary shelter or a place to process an animal, but the available evidence also shows their use by carnivores and repeated natural processes. The absence of known houses is not proof that no people ever camped in the open; later glaciation, erosion and rising seas have removed or buried many likely traces. It is, however, a strong reason not to claim settlement where none has been found.

A Fragile Beginning

The principal development illuminated around this date is therefore ecological and evidential. Ireland contained, at least in some regions and intervals, habitable cold-country environments supporting reindeer and other Pleistocene mammals. Castlepook preserves the strongest presently known suggestion that

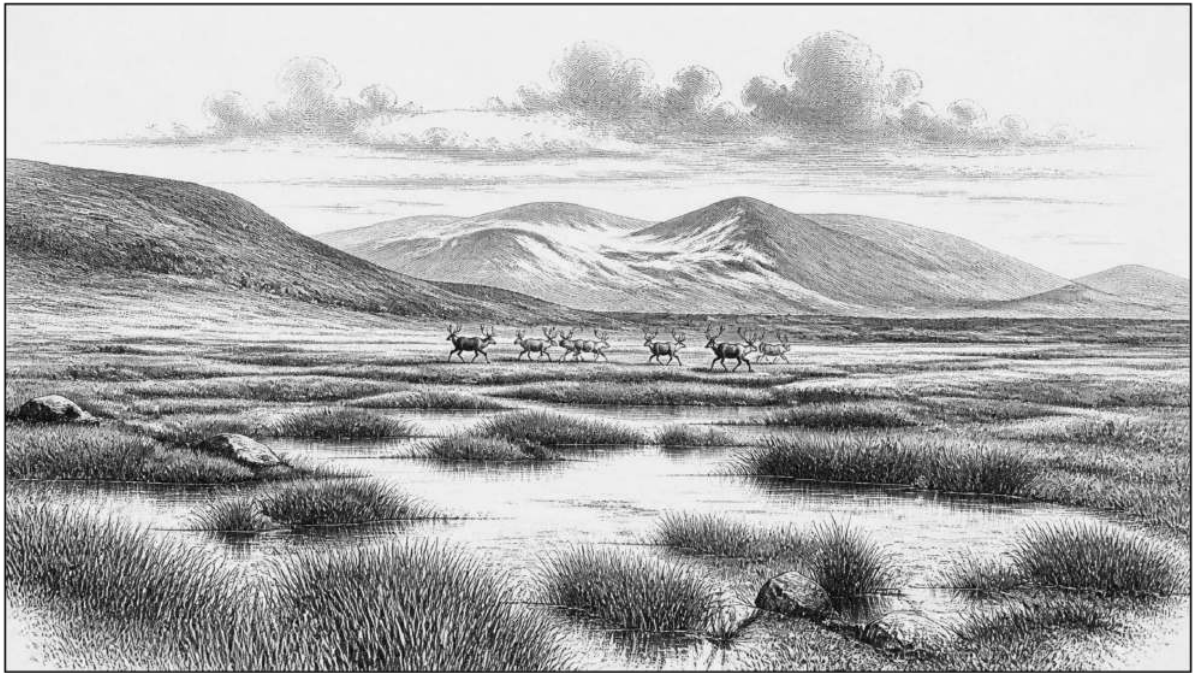
people may have entered that world and butchered one of its animals. Derrynvree preserves a different but complementary record of tundra wetland beneath later glacial deposits. Together they replace the older image of pre-ice-age Ireland as a blank on the human map, while also insisting on restraint.

For 31,631 BCE, the honest historical conclusion is not that an Irish society did a known thing in a known year. It is that the island's deep past contained episodes of open, cold habitat, mobile fauna and perhaps fleeting human presence before the last ice sheet became dominant. Future excavation, improved dating and microscopic reassessment may strengthen, qualify or overturn particular interpretations. For now, a reindeer bone in a Cork cave remains the most vivid witness: not a chronicle, but a small and difficult trace of lives lived at the edge of an advancing Ice Age.

Chapter 071 of 100

31630 BCE

Castlepook's Cave Fauna^[71]



The label 31,630 BCE is a modern device, not a date anyone in prehistoric Ireland could have known or recorded. It should not be treated as the year of a named event, a ruler, a battle or a migration. At this depth of time, the responsible unit is a broad environmental and archaeological interval. Converting the date mechanically places it about 33,580 years before AD 1950, but even that calculation must not create false precision: radiocarbon determinations have to be calibrated, their ranges can be wide, and deposits in caves or beneath glacial sediments are rarely neat annual archives.

In the North Atlantic climatic sequence, this notional point falls near the beginning of Greenland Interstadial 6, conventionally dated to roughly 33,740–33,360 years before AD 2000. An interstadial was a relatively milder episode within the last Ice Age, not a modern-style warm period. Its effects varied greatly across regions. Ireland lay on the north-western edge of Europe, exposed to rapid climatic shifts, changing ice margins and low sea levels. The island's evidence is too fragmentary to reconstruct weather, seasons or human activity for one numbered year, but it can illuminate the kind of country Ireland may have been during this unstable phase.

An Island Before Maximum Ice

31,630 BCE came long before the Last Glacial Maximum, the later phase in which the British–Irish Ice Sheet reached its greatest overall extent, broadly between about 26,500 and 19,000 years ago. That does not mean Ireland was comfortably ice-free. Ice had advanced and retreated repeatedly during the Pleistocene, and the build-up to the last major glaciation was neither uniform nor simultaneous across the island. Reconstructions differ over the scale and timing of earlier ice, because subsequent glaciers removed, mixed and buried much of the relevant evidence.

There are nevertheless grounds for seeing substantial parts of Ireland as not yet overwhelmed by the final ice-sheet expansion. Exposure-age evidence from north-central Ireland indicates ice-free conditions there until at least about 34,000 years ago. Other work suggests that the last Irish Ice Sheet expanded materially after this time and that Ireland was largely glaciated by about 32,000 years ago. The apparent tension is useful rather than fatal: it shows why a single all-Ireland description is unsafe. Around the date in question, different districts may have experienced very different realities—open ground, advancing local ice, periglacial frost action, ice-dammed water or terrain already modified by older glaciers.

For people today, “Ireland” naturally suggests an island with familiar coastlines. That image is misleading for the Ice Age. Global sea levels were lower than now, exposing parts of the continental shelves around north-west Europe. Yet lower seas do not automatically prove a walkable land bridge from Ireland to Britain. The Irish Sea basin, local topography, glacial loading and changing water levels made connections complex and temporary. It is therefore prudent neither to picture a permanent land route nor to assume that any animal or person reaching Ireland must have crossed open sea in the modern sense.

What the Caves Preserve

The most important Irish evidence for this broad period comes from limestone caves, particularly Castlepook Cave near Doneraile in north Cork. Caves are powerful but difficult archives. They can shelter animals, trap remains, receive washed-in sediment and later be disturbed by collapse, excavation or scavenging. A bone from a cave establishes that an animal died or was deposited there; it does not, by itself, identify the landscape immediately outside, prove that species lived there year-round, or reveal a single moment of human activity.

Even so, Castlepook preserves an exceptional record of pre-Last Glacial Maximum fauna. Re-dating has revised the chronology of several southern Irish cave collections and demonstrated that certain bones are significantly older than formerly thought. The implications are substantial. Mammoth, reindeer, giant deer, brown bear, wolf, spotted hyaena and smaller cold-adapted mammals occur within the wider Irish Late Pleistocene record. These finds reveal that Ireland was at times part of a broader north-west European ecological world in which large herbivores and carnivores could move through suitable habitats.

That list must not be converted into a census for 31,630 BCE. The dated bones have separate ages, uncertainties and archaeological contexts. Some species may have overlapped; others may represent different episodes spanning many millennia. Carden, Higham and Woodman’s reassessment suggests, for example, that giant deer and spotted hyaena may already have disappeared locally by around 40,000 calibrated years ago, well before the Last Glacial Maximum. Reindeer is especially evocative because it indicates open, cold-country habitats, but a reindeer bone is not proof of a continuously occupied reindeer plain at the exact point represented by this article.

The cave fauna nevertheless permits a careful environmental interpretation. Ireland’s landscapes included open country capable, at least at intervals, of supporting grazing animals. The presence of mammoth and reindeer in the wider record is consistent with a mosaic often described as mammoth-steppe or tundra-steppe: largely treeless ground with grasses, herbs, sedges and patches of wetter vegetation. Carnivores such as hyaenas and wolves would have followed prey, competed for carcasses and used sheltered sites. Brown bears may have used caves, complicating any attempt to treat caves as human places by default.

Fermanagh's Buried Wetlands

Evidence from Derryvree near Maguiresbridge, County Fermanagh, offers a different but complementary view. Road works exposed fine sands and organic silts caught between two layers of glacial till within a drumlin. The organic deposit produced a radiocarbon determination of about 30,500 radiocarbon years before present, with a large uncertainty; calibration places it broadly in the same late Marine Isotope Stage 3 world as the date considered here, rather than securely in one calendrical year. Its position between tills is as significant as its date: it records an interval of non-glacial or less intensely glacial conditions between major episodes of ice deposition.

The Derryvree plant and insect evidence indicates a treeless, periglacial wetland or muskeg landscape. Grasses, sedges, herbs, juniper and mosses point to saturated ground, shallow pools and open vegetation rather than woodland. This was not an empty white wilderness. In summer, low plants, wet hollows and standing water could support insects, waterbirds and herbivores; in winter, severe frost and snow would have imposed formidable constraints. Such environments could change quickly as temperature, precipitation, wind exposure and ice margins shifted. The local evidence is valuable precisely because it gives texture to a period otherwise known mostly through glacial landforms and cave bone.

There is no responsible basis for describing fields, villages or a settled Irish population in this landscape. No securely stratified dwelling, hearth, stone-tool assemblage, burial or repeated occupation surface has been identified in Ireland for around 31,630 BCE. Ireland has yielded securely dated evidence of Late Upper Palaeolithic human activity much later, at Alice and Gwendoline Cave in County Clare, where a butchered brown-bear patella dates to roughly 12,810–12,590 calibrated years before present. That important discovery confirms that hunter-gatherers eventually reached the island, but it cannot be projected backwards by another twenty thousand years.

People: Possibility and Silence

Claims of much earlier human activity require especially cautious wording. A reindeer femur from Castlepook has been presented publicly as bearing a deep modification interpreted as a sharp-tool cut, and as dating to about 33,000 years ago. If specialist analysis ultimately confirms both the mark's human origin and its association with the bone's age, it would be major evidence for Upper Palaeolithic visitors processing an animal in Ireland during this broad period. It would still not demonstrate a permanent colony, continuous occupation, named community or ancestral link to later inhabitants.

The limitations are fundamental. The specimen derives from an old cave collection, not from a modern excavation of an intact camp floor with associated tools, fire residues and food waste. Radiocarbon dating establishes when the animal lived, not automatically when a mark was made, where it was killed or how long humans may have remained nearby. Natural abrasion, carnivore damage, excavation history and post-depositional movement must all be excluded before a mark can bear historical weight. The most defensible conclusion for 31,630 BCE is therefore that human presence in Ireland remains unproven, though the question is now more open than it once was.

This evidential silence sets strict limits on social and political history. There were no known polities, chiefs, diplomatic relations, territorial institutions or wars in Ireland that archaeology can place here. If people did enter the island, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds documented elsewhere in Europe, where small groups relied on detailed knowledge of animals,

raw materials, routes and seasonal resources. But that is a regional comparison, not direct Irish evidence. It must not be mistaken for proof that Irish groups made similar tools, exchanged objects, practised particular rituals or spoke any identifiable language.

No Calendar, No Kingdoms

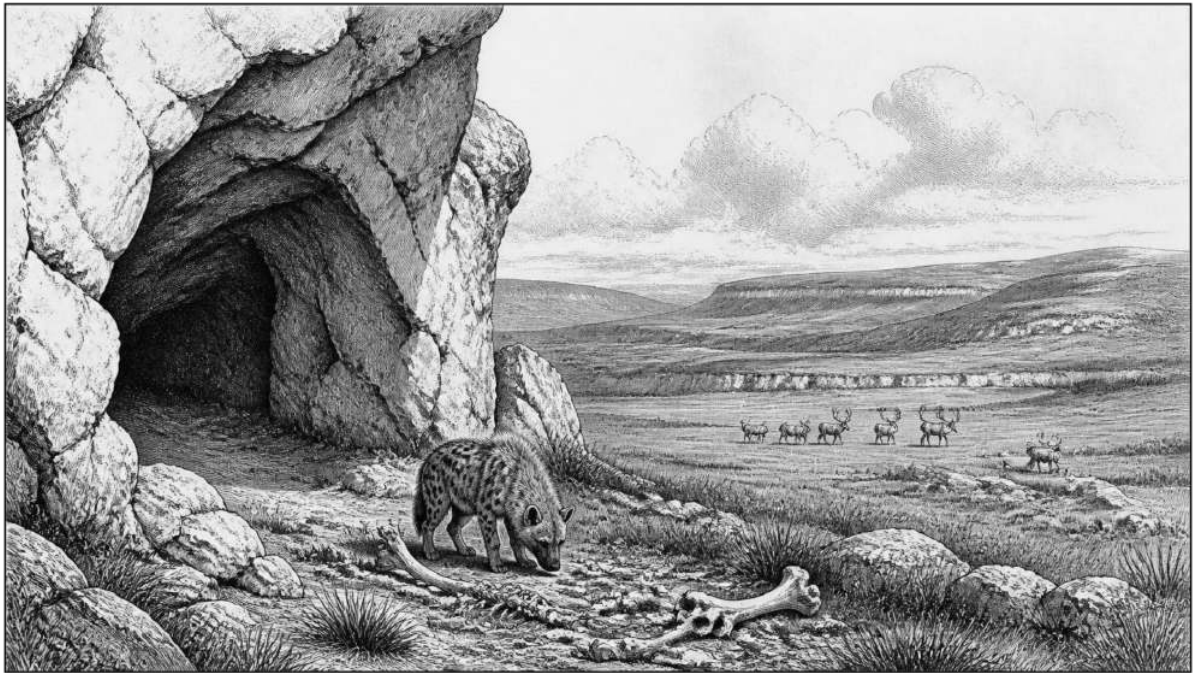
Religion, culture and learning are likewise beyond direct recovery for this date in Ireland. There are no Irish cave paintings, portable artworks, graves or ceremonial structures securely attributable to this time. Nor is there evidence for trade in the ordinary sense: no local assemblage proves exchange networks, imported stone or the movement of crafted goods. The absence of evidence is partly historical and partly geological. Later ice sheets eroded surfaces, redistributed sediments and lowered the likelihood that temporary camps on exposed ground would survive. Former coastal landscapes, meanwhile, lie beneath modern seas.

The real history of Ireland around 31,630 BCE is thus one of changing habitats and incomplete archives. It was a land approaching a major glacial transformation, yet one that still supported, at intervals, a distinctive cold-climate fauna and wetland vegetation. Castlepook's bones and Derryvree's buried silts do not supply an annual chronicle. They do something more fundamental: they show that Irish history begins not with kings or monuments, but with difficult evidence for life at the edge of ice—animals moving through open country, plants persisting in wet ground, and landscapes repeatedly altered by climate before any durable human record survived.

Chapter 072 of 100

31629 BCE

Awbeg's Hyena Bonehouse^[72]



The label 31,629 BCE cannot identify a day, season, event or generation in Irish history. No written calendar existed, and the evidence does not permit modern year-by-year precision. In archaeological terms it corresponds only approximately to 33,600 calibrated years before 1950, within the later part of the Last Glacial period, conventionally Marine Isotope Stage 3. The responsible task is therefore to examine dated ranges that overlap this point and to ask what they reveal about Ireland's changing landscapes, animals and possible human visitors.

A Landscape Between Advances

Ireland was not yet the uniformly ice-covered land often imagined under the phrase "Ice Age". The great British-Irish Ice Sheet was building towards its later maximum, but its growth was uneven across different regions and its margins changed through time. Modern reconstructions indicate major expansion from about 31,000 years ago, with the ice sheet attaining its greatest overall volume much later, around 23,000 years ago. That broad chronology matters: 31,629 BCE belongs to an early and uncertain phase of glacial growth, not automatically to a moment when every Irish valley lay beneath ice.

Evidence from County Fermanagh provides an important corrective to any simple map. At Derryvree, near Maguiresbridge, freshwater silts and organic deposits were sealed beneath later glacial till. A radiocarbon determination from this sequence has been calibrated to a broad range of roughly 36,900–31,700 years before present. The range overlaps the modern label 31,629 BCE. It indicates that, during some part of that interval, freshwater and terrestrial environments existed in north-central Ireland before later ice overrode the site. It does *not* demonstrate the exact weather, vegetation or human presence in that numbered year.

Greenagho, also in Fermanagh, supplies related but slightly earlier evidence. Organic material from lake deposits beneath till produced a calibrated age range of approximately 37,200–35,700 years before present. Taken together, the Fermanagh sites show that parts of inland Ireland retained ice-free or seasonally ice-free landscapes into the build-up of the last ice sheet. Their survival beneath later deposits is remarkable, but it also makes clear how fragmentary the record is: later glaciers erased or rearranged much of what had existed above ground.

Other records complicate the picture further rather than cancelling it. Marine deposits and reworked shells around Donegal Bay have been used to argue for substantial ice loading in western Ireland over a long span before the Last Glacial Maximum. Such evidence concerns particular coasts, sea levels and ice masses, not a single condition applicable everywhere. Ireland around 33,600 calibrated years ago was a region of contrasts: open ground and freshwater basins may have persisted in some areas while glaciers, ice caps or ice-fed seas affected others. The familiar outline of the modern island is also misleading, since lower sea levels had altered coasts and the connections between Ireland, Britain and the continental shelf.

Cold Open Country

The Derryvree deposits support a picture of a cold freshwater setting surrounded by sparse, open vegetation rather than a wooded Irish countryside. Fine sediments, plant remains and pollen can preserve evidence of water, marshy margins and the plants that grew nearby, yet they offer a local record rather than an island-wide botanical survey. The terrain probably included wet hollows, stream corridors, exposed mineral soils and wind-swept slopes. Trees, if present in sheltered pockets, would not have formed the extensive forests associated with later interglacial Ireland.

This was a dynamic periglacial world. Repeated freezing and thawing disturbed soils; seasonal meltwater shifted sand and silt; and vegetation had to exploit a short growing season. Cold does not mean lifelessness. Low herbs, grasses, sedges, mosses and dwarf shrubs could sustain grazing animals, while wetlands concentrated water and plant food. But productivity was seasonal and patchy. For any creature moving across the landscape, rivers, lake edges and sheltered limestone valleys were likely to have been more useful than the exposed uplands.

At this date, there were no Irish farms, fields, roads, villages or managed woodlands. Nor can historians responsibly identify a named territory, political community or boundary. The terms politics, diplomacy and warfare belong to societies for which people, institutions and enduring social relationships can be observed. Here the material record is far too thin even to establish a resident human population. Competition and predation certainly occurred among animals, but they should not be turned into a prehistoric version of state affairs.

The Cave at Castlepook

The most vivid evidence comes from Castlepook Cave, also called Mammoth Cave or Doneraile Cave, above the Awbeg Valley in north County Cork. Excavations in the early twentieth century produced Ireland's richest known assemblage of Late Pleistocene vertebrate remains. Among the animals identified from the cave are woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; later cold-stage deposits have also yielded such animals as Arctic fox, wolf and lemmings. The National Museum of Ireland holds important specimens, including a spotted-hyena skull from the cave.

These finds demonstrate that Ireland's Pleistocene fauna was once much richer than the fauna of the modern island. Reindeer and giant deer imply open grazing country; mammoth points to a still more formidable component of the wider cold-climate fauna; carnivores show that carcasses and herbivore herds supported complex food webs. Yet the cave is not a frozen snapshot of one season. Bones entered it over different episodes and by different processes. Hyenas may have carried prey remains into the chambers, while water movement, excavation methods and later disturbance mixed deposits. A species present at Castlepook cannot automatically be placed alive at the cave mouth in 31,629 BCE.

That caution is especially important for the cave's reindeer femur. A bone from Castlepook, publicised in 2021, was reported as approximately 33,000 years old and bearing a mark interpreted as damage from a stone tool during butchery. If that interpretation is sustained through detailed taphonomic study, it would be evidence for a human visit to Ireland far earlier than the formerly accepted Late Glacial record. The date is broadly relevant to this article's period, but it is not a precise calendar date, and the mark is not equivalent to a securely excavated campsite.

No associated hearth, stone-tool assemblage, dwelling floor, burial or repeated occupation horizon has yet established a settled Upper Palaeolithic community in Ireland at this time. A single modified animal bone, even if confirmed, could represent a brief hunting or scavenging episode by people moving through a wider north-west European landscape. Equally, researchers must keep testing whether natural damage, collection history or the cave's disturbed context affects the conclusion. The distinction between a dated bone and a dated human occupation is fundamental.

Life Beyond the Evidence

If people did reach Ireland during this interval, their immediate economy would have depended on mobility and local resources: animal meat and fat, hides, bone and antler, fuel where it could be found, freshwater and perhaps edible plants in season. Such possibilities are reasonable inferences from Upper Palaeolithic lifeways elsewhere in Europe and from the Irish fauna. They are not direct proof of an Irish hunting camp, food-sharing custom, family group or technology. No proven Irish art, ornament, ritual site or structured burial belongs to this horizon.

There is likewise no evidence for trade in the later sense. Lower sea levels and changing coastlines may have made animal and human movement between Ireland, Britain and the continental shelf more feasible at intervals, but neither an exact land route nor a network of exchange can be reconstructed for this date. The fauna proves that mammals crossed into Ireland during the wider Late Pleistocene; it does not tell us whether humans travelled alongside every migration, nor whether crossings were routine.

Religion, learning and culture must therefore be discussed through absence as well as possibility. Humans of comparable age elsewhere in Europe possessed sophisticated stone technologies, social knowledge and, in some regions, striking artistic traditions. It would be wrong to deny similar capacities to any visitors who reached Ireland. It would be equally wrong to project continental cave art, ceremonial practice or language onto Castlepook without an Irish object or context to support it. In 31,629 BCE Ireland has environmental history, animal history and perhaps a human trace; it does not yet have a recoverable cultural biography.

A Precarious Habitable Margin

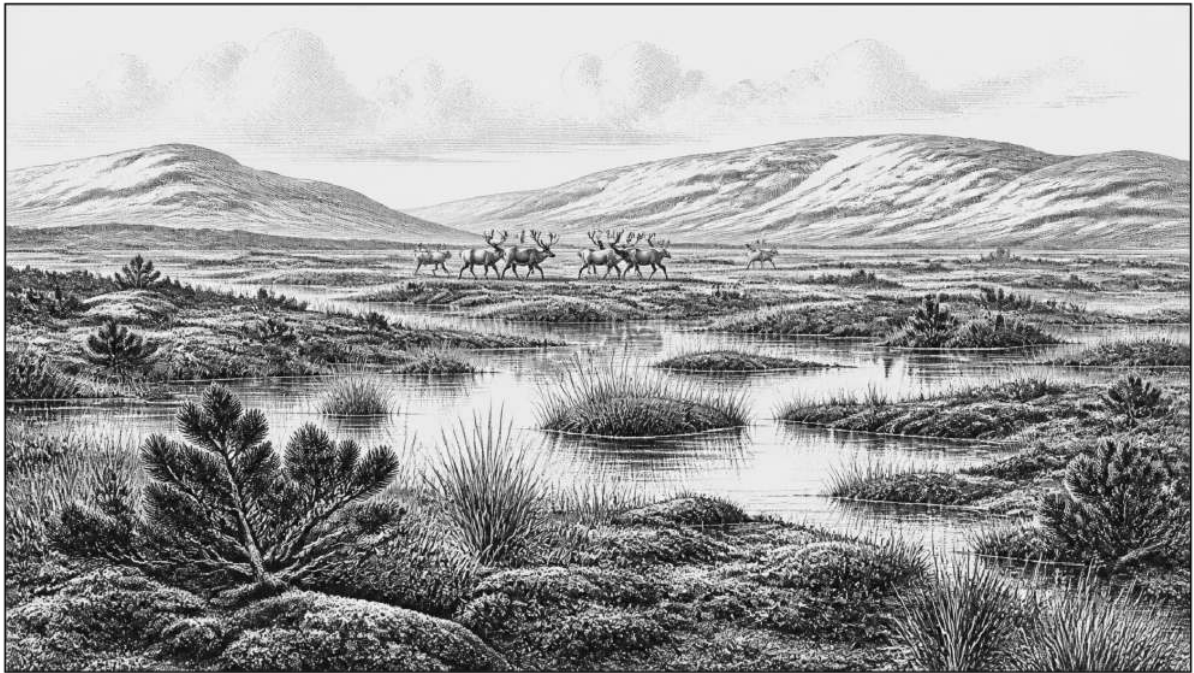
The enduring significance of this period lies in its instability. The Irish landscape was neither an empty white expanse nor a permanent homeland known through settlements and monuments. It was a shifting margin where freshwater basins could persist beneath cold skies, large mammals could move through open habitats, hyenas could use limestone caves, and advancing ice was beginning to reshape the possibilities for all of them. In later millennia, the growing ice sheet would cover and scour much of the country, destroying countless traces.

For that reason, the silts at Derryvree and the bones at Castlepook deserve emphasis out of proportion to their small size. They preserve different forms of evidence: one a local environmental sequence, the other a cave assemblage accumulated over time. Together they allow a restrained conclusion. Around the broad chronological horizon represented by 31,629 BCE, parts of Ireland could support cold-adapted ecosystems and substantial mammals. Human presence remains a promising but unconfirmed early possibility, not a basis for invented tribes, leaders or events. The proper history of this date is a history of evidence, uncertainty and a landscape on the threshold of profound glacial change.

Chapter 073 of 100

31628 BCE

Maguirebridge's Muskeg Pools^[73]



The label 31,628 BCE is a modern chronological marker, not a year that anybody in Ireland could have known, named or recorded. At this depth of time, it cannot responsibly be attached to a particular event, season, individual or generation. In the archaeological convention of years before present, counted from 1950, it lies roughly 33,600 calendar years ago, in the later part of Marine Isotope Stage 3, an unsettled interval of the Late Pleistocene. That conversion is only a guide to scale: radiocarbon ages must be calibrated, their ranges are often broad, and the surviving Irish evidence cannot be resolved to a calendar year. The appropriate subject is therefore Ireland in a wider environmental window around this notional date, rather than an imagined annal for it.

It was an Ice Age Ireland, but not simply an island buried beneath the ice sheet familiar from later glacial maps. The main Last Glacial Maximum expansion of the British–Irish Ice Sheet came afterwards, with major advances in the Celtic Sea and around Ireland occurring later in the glacial cycle. Around the 34th millennium before present, conditions varied sharply through time and place. Some land was available for plants and animals; other areas may have been affected by severe periglacial cold, local ice, frozen ground and unstable drainage. The evidence is fragmentary precisely because later ice and meltwater stripped, buried and rearranged so much of the older landscape.

A Date Without an Annal

The difference between a radiocarbon determination and a calendar age matters especially here. Organic silts at Derryvree, near Maguiresbridge in County Fermanagh, produced the important legacy result of 30,500 radiocarbon years BP, with a substantial uncertainty. Earlier published calibration placed that determination broadly between about 36,900 and 31,700 calendar years BP. Such a span includes the

notional date in this article, but it does not date a Derrynree pool, plant or animal to 31,628 BCE itself. Modern calibration curves extend to this period and improve the framework, yet they do not turn one old determination into annual precision.

This caution is more than technical. There was no writing, no calendar, no named polity and no secure settlement sequence in Ireland from which to reconstruct public affairs. Archaeology can establish that a freshwater habitat existed at Derrynree during an ice-free interval, that cold-adapted animals were present in Ireland during broadly comparable phases, and that climate and ice margins changed. It cannot identify a chief, a treaty, a battle, a ritual gathering or a trading voyage in this particular year. Silence on these matters is not a gap to be filled with picturesque conjecture; it is the historical result of what the evidence does and does not preserve.

Water Beneath the Drumlin

Derrynree is the clearest Irish environmental archive relevant to this period. Road excavations in 1969 cut through a drumlin and revealed fine sands and organic silts between two distinct sheets of till, the debris left by glaciers. The organic layer was therefore deposited during an interval when freshwater and vegetation occupied the site before a subsequent ice advance sealed it below the drumlin. Its value lies not in offering a complete landscape map, but in preserving biological detail from ground that later glaciation might otherwise have erased.

Pollen, plant macrofossils, mosses and insect remains indicate open, predominantly treeless vegetation. Grasses, sedges, herbs and juniper are among the signals reported from the sequence. The assemblage has been interpreted as tundra or muskeg-like terrain: wet, mossy ground with shallow pools and organic-rich margins, set in a harsh periglacial climate. ‘Muskeg’ should not be read as a precise modern habitat transplanted wholesale into prehistoric Fermanagh. It is a useful description of a wet, peaty mosaic rather than evidence for a uniform bog stretching across Ireland.

For everyday life, the chief lesson is environmental difficulty. Frost, short growing seasons, exposed ground and seasonal water would have shaped where animals could graze and where any people might move. Yet Derrynree was not a lifeless white wilderness. Open plant cover supported insects; wet hollows held freshwater; and the wider faunal evidence shows that sizeable mammals reached Irish landscapes in parts of the Middle Midlandian. Local conditions almost certainly shifted more rapidly than a single annual label can convey.

Caves and Cold-Stage Animals

Castlepook Cave, in the Awbeg valley near Doneraile in north County Cork, provides the most important Irish faunal collection for the broad pre-maximum interval. Its caves yielded remains attributed to mammoth, reindeer, giant deer, brown bear, wolf, foxes, arctic fox, lemmings and spotted hyaena. This is powerful evidence that Ireland could at times support, or at least be visited by, a far richer cold-stage animal community than the island’s later historical fauna would suggest. Reindeer and mammoth point towards open feeding grounds, while predators and scavengers imply a food web rather than isolated wanderers.

But Castlepook must be handled with care. Much of the material was recovered in antiquarian excavations, from chambers whose deposits were disturbed, reworked or accumulated over long periods. Direct dates on different bones demonstrate that the collection is not a single moment frozen in time. A mammoth bone and a hyaena bone were once among the key evidence for a fauna around 34,000

radiocarbon years BP, while later dating programmes revealed a complicated chronological mixture. A cave is also not a straightforward census of the surrounding countryside: carnivores can carry prey in, water can move bones, and animals may die there naturally.

The responsible picture, then, is of ecological possibility rather than certainty about every species being present together in 31,628 BCE. Around this broad phase, open habitats in parts of Ireland were capable of supporting herbivores and their predators. The cave record also demonstrates repeated animal movement into the island over the long Pleistocene. It does not establish a continuous, stable fauna across all regions, nor does it prove that a particular mammoth herd crossed County Cork in the year supplied by the modern chronology.

The Human Question

The most consequential but most limited human evidence is a reindeer femur from Castlepook that has been reported as bearing a deep mark consistent with fresh-bone processing by a sharp stone tool, and as dating to roughly 33,000 years ago. If the dating, context and interpretation are sustained by further study, it would move evidence for human activity in Ireland far earlier than the formerly secure post-glacial record. It would suggest that Upper Palaeolithic people reached the island during a comparatively habitable phase of the Ice Age. Recent fieldwork has sought to investigate Castlepook afresh and assess its remaining deposits.

That finding cannot, however, bear the weight of a settled national origin story. There is no securely associated dwelling, hearth, burial, human bone, stone-tool assemblage or repeatedly occupied living surface from Ireland that can be assigned to this narrow period. Nor is there evidence for a permanent population, kin group, language, social hierarchy or migration route. The femur may ultimately document a brief visit by highly mobile hunters, perhaps involving the processing of one carcass; even that remains an interpretation requiring corroboration. It cannot identify the makers as ancestors of later Irish communities.

This distinction also limits what can be said about political affairs, conflict and diplomacy. No territories, leaders, alliances or organised warfare are archaeologically visible. Similarly, there is no direct evidence for religious practice, art, formal learning, exchange networks or domestic economy in Ireland around this point. Upper Palaeolithic communities elsewhere in Europe made sophisticated tools, ornaments and images, but importing those achievements into Ireland without Irish finds would be inference, not evidence. The absence of proof is particularly understandable where portable camps and organic materials faced tens of millennia of weathering, glaciation and sea-level change.

Routes, Coasts and Regional Change

Lower global sea level altered the geography of north-west Europe, but it is unsafe to imagine a simple dry land bridge from Britain to Ireland at this date. Whether a traversable connection existed depended on the changing form of the Irish Sea basin, local sea level, crustal movement and the position of ice. The presence of Pleistocene mammals proves that they reached Ireland during favourable intervals; it does not settle how each species travelled or whether people followed the same route. Any human visitors implied by Castlepook would have moved through a landscape whose coasts and waterways differed profoundly from those of modern Ireland.

Regional contrast is therefore central. Fermanagh preserves a wetland record below a drumlin; north Cork preserves cave bones; other former habitats are now lost beneath later deposits, beneath the sea, or were removed by ice. Derryvree and Castlepook should not be treated as neighbouring scenes from one simultaneous Irish day. They are separate, imperfect windows into a prolonged and fluctuating period. Together, nevertheless, they replace an older picture of an entirely blank Ireland with a more rigorous one: intermittently open land, cold-adapted wildlife, freshwater refuges and a still-unresolved possibility of very early human presence.

What Can Be Said Responsibly

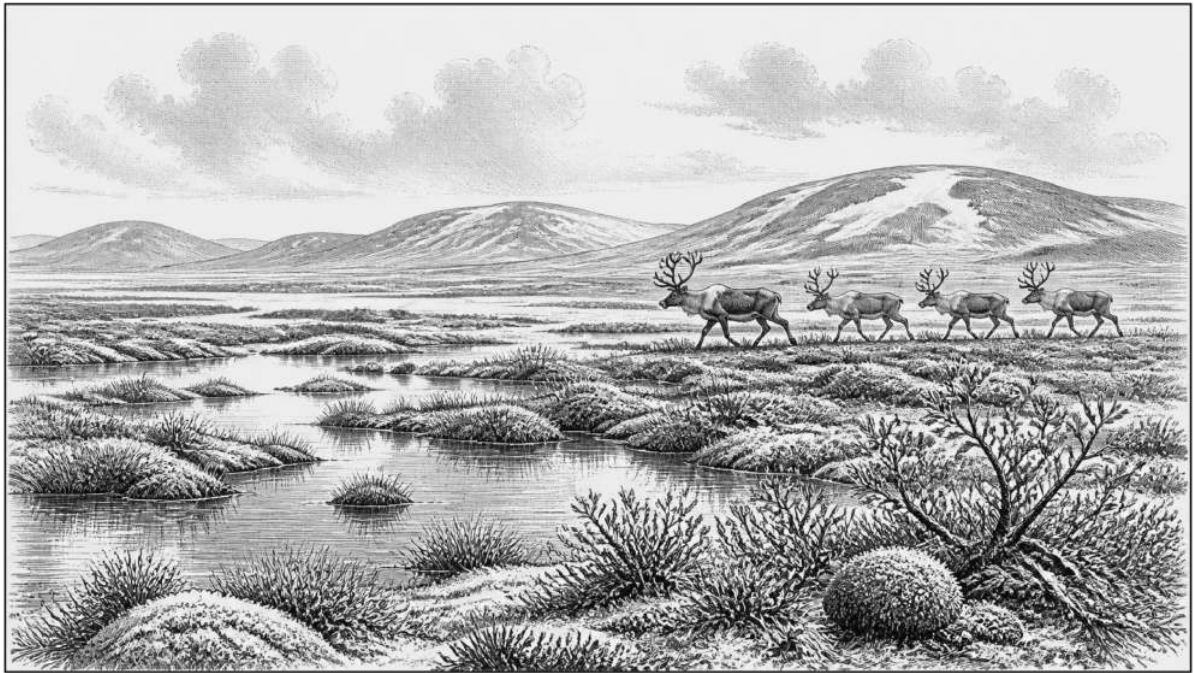
For Ireland around 31,628 BCE, the most important development was environmental rather than political. The island was within the volatile later stages of MIS 3, before the principal advance of the last ice sheet. At Derryvree, an ice-free freshwater landscape supported tundra-like vegetation under severe climatic conditions. At Castlepook, a complex cave archive preserves evidence of large mammals and carnivores from the wider cold-stage world. A contested but important reindeer bone raises the possibility that people were present, perhaps briefly, at roughly this time.

That is a substantial history, even without a named event. It shows Ireland as neither timelessly isolated nor securely inhabited: a changing northern landscape repeatedly opened to life and later transformed by ice. The discipline required by 31,628 BCE is to preserve the difference between evidence and imagination. The bones, silts, seeds, pollen and insects permit a vivid but bounded reconstruction. Beyond them lie questions that future excavation, improved dating and renewed study of museum collections may clarify, but which this single calendar label cannot answer.

Chapter 074 of 100

31627 BCE

Derryvree's Buried Marsh^[74]



The label “31,627 BCE” is a modern way of locating a point deep in prehistory, not a year that can be recovered from the Irish archaeological record. In the conventional system where “before present” is counted from 1950, it falls roughly 33,576 years ago. No written record, seasonal chronology, named individual or identifiable event permits calendar-year precision at this depth of time. The responsible history of Ireland at this point must therefore be framed through broader, calibrated chronologies and through fragmentary geological and fossil evidence.

That point lies within the later part of the Pleistocene, during Marine Isotope Stage 3: a long, climatically unstable interval of the last Ice Age. Ireland had not yet reached the fullest expansion of the last Irish ice sheet, generally placed at about 27,000–23,000 calibrated years before present. Yet it was already a cold, changing northern landscape, and its surviving record is exceptionally incomplete. Later ice, meltwater and erosion stripped away or rearranged many earlier deposits. What remains is not a continuous national story, but a handful of difficult archives: buried wetland sediments, cave bones, glacial landforms and, possibly, one modified animal bone.

A Marsh Between Ice Advances

The clearest Irish environmental evidence relevant to this broad era comes from Derryvree, near Maguiresbridge in County Fermanagh. There, organic silts and sands were found between two deposits of glacial till. This stratigraphic position matters. It shows that, for a time, an ice-free or less ice-dominated environment developed after one advance and before a later one buried the deposits beneath fresh glacial material.

A radiocarbon determination from the Derryvree organic beds produced an age of $30,500 \pm 1,100$ radiocarbon years BP. Such an old result cannot be converted into one neat calendar date: calibration produces a range rather than a single answer, and the dated material belongs to a deposit accumulated over time. Nonetheless, it places the site broadly in the environmental world relevant to the thirty-fourth millennium before present, close enough to illuminate conditions around the modern label 31,627 BCE.

The plant and insect remains point to a treeless muskeg: a wet, peaty landscape of mosses, sedges, grasses, herbs and shallow pools. Fossils include plants associated with cold, open settings, among them dwarf willow and juniper. This was not an Irish landscape of later oak woodland, enclosed fields or boggy pasture. It was a seasonally severe terrain in which waterlogged hollows, frozen ground, exposed mineral soils and windswept vegetation existed beside one another. Cold winters are strongly indicated; summer warmth was sufficient for a living wetland community, but not for forest.

Derryvree also demonstrates a larger truth about the period. Ireland's physical geography was unsettled. Ice masses expanded and contracted over millennia, while rivers, lakes and wet hollows formed, vanished and were overridden. The familiar outline of the island was not a reliable guide to its ancient habitats. Lower global sea levels exposed wider shelf areas, but the exact routes available to animals or people varied with sea level, ice, local relief and the persistence of marine channels. It is unsafe to picture a simple, permanent land bridge either to Britain or continental Europe.

Animals of the Cold Country

For evidence of animal life, Castlepook Cave near Doneraile in north County Cork is indispensable. Also known as Mammoth Cave, it is Ireland's richest cave archive for Late Pleistocene vertebrates. Its collections, assembled principally during early twentieth-century excavations and later reassessed, include remains attributed to woolly mammoth, spotted hyaena, brown bear, wolf, reindeer, giant deer, foxes, hares and lemmings. Together they show that Ireland was, at intervals before the Last Glacial Maximum, part of a broader north-west European zone through which large mammals could disperse.

The cave should not be mistaken for a perfectly preserved snapshot of one day or one generation. Caves can be dens, traps, shelters, drainage channels and repositories for material dragged in by scavengers. Many Irish cave assemblages were excavated before modern standards of recording, and their deposits were disturbed or poorly documented. A mammoth bone, a hyaena bone and a reindeer bone from Castlepook cannot automatically be assumed to have been deposited in the same season, or even the same millennium. Radiocarbon results from old collections are vital, but they date individual specimens rather than an entire cave "occupation".

Even so, Castlepook provides a compelling ecological outline. Reindeer and lemmings are especially suggestive of open, cold habitats; hyaenas, wolves and bears indicate a complex carnivore community; mammoths and giant deer attest to a landscape capable, at least intermittently, of sustaining large herbivores. The best interpretation is a mosaic rather than a uniform frozen desert. Open grassland, herb-rich ground, damp hollows and sheltered limestone country could support different species, while the severity and length of winter placed firm limits on plant growth and animal movement.

Recent sedimentary ancient-DNA work from Castlepook has added promising evidence for links between Irish animals and wider Eurasian populations. It has identified ancient DNA from a range of taxa and recovered mitochondrial sequences from Irish cave hyaenas and woolly mammoths. This research is currently a preprint rather than a peer-reviewed final publication, so its conclusions remain provisional. Its importance lies in reinforcing, rather than replacing, the fossil evidence: Ireland's fauna was not wholly isolated, but belonged to changing Pleistocene networks beyond the present coastline.

The Reindeer Bone Question

One Castlepook object has particular relevance to any account of this era: a reindeer femur bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool while the bone was fresh. County Cork heritage publications have presented the bone as dating to about 31,000 BCE and as evidence that Palaeolithic hunters butchered reindeer in Ireland. If that interpretation is confirmed through continuing specialist study, it would be an extraordinarily early indication of human activity on the island.

The claim must be stated carefully. The specimen is not from a modern excavation of an undisturbed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial, human bone, ornament or repeatedly used campsite of comparable age has been found in Ireland. The radiocarbon age of an animal bone establishes when the animal lived and died; it does not by itself date the cut, identify the place of killing, prove that the animal was hunted rather than scavenged, or establish how long people remained in the vicinity. Identifying a mark as human-made is also a specialist judgement, requiring alternatives such as carnivore damage, sediment movement and later breakage to be excluded.

The most defensible conclusion is therefore limited but significant. Around the broad period represented by 31,627 BCE, Ireland may have been visited by Upper Palaeolithic people who processed a reindeer carcass. That possibility is not evidence for a permanent population. It cannot support a named culture, a settled territory, a continuous ancestry or an Irish “first community” at this date. The reindeer femur is an invitation to further fieldwork, especially at Castlepook, rather than a licence to fill the archaeological silence with certainty.

No Politics, but a Human Question

There is no basis for describing political affairs, diplomacy, warfare, leadership, law, language or ethnic identity in Ireland at this point. None of the institutional evidence that would make such subjects meaningful exists. Nor is there evidence for domestic settlements, food stores, farming, exchange networks, seafaring technology, ritual monuments or formal religious practice. Agriculture lay tens of thousands of years in the future. The later monuments, myths and languages often associated with Irish antiquity have no demonstrable connection to this Ice Age landscape.

If people were present, comparison with better documented Upper Palaeolithic groups elsewhere in north-west Europe suggests that they would have been highly mobile hunter-gatherers dependent on close knowledge of animal behaviour, weather, fuel and shelter. But that is an interpretation drawn from neighbouring regions, not a reconstruction demonstrated by Irish finds. Ireland provides no excavated camp from which to infer group size, social organisation, clothing, hunting equipment, art or belief. The absence of evidence is partly the result of destructive glaciation and submerged landscapes; it is nevertheless a real limit on what can be claimed.

Approaching the Great Freeze

The most important long-term development was environmental, not political. Ireland was moving towards the Last Glacial Maximum, when the Irish component of the British–Irish Ice Sheet expanded across much of the land and continental shelf. Research indicates that the southern Irish coast remained ice-free until after about 45,700 calibrated years BP and before the later major advance, but the detailed

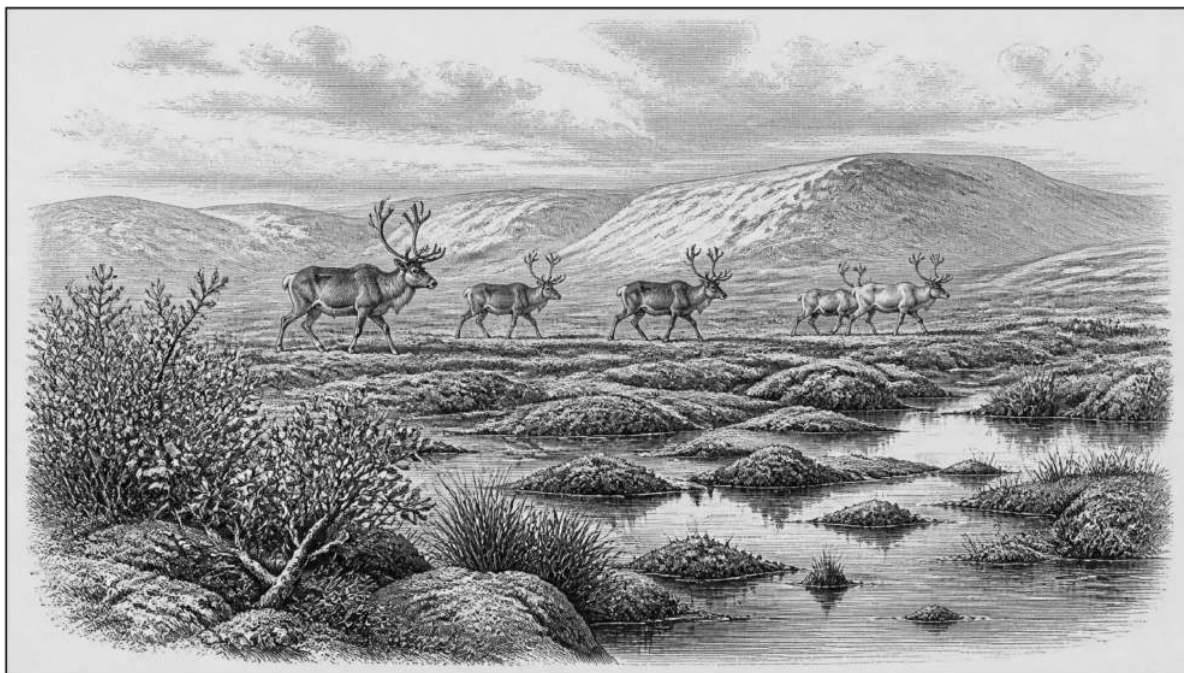
timing and extent of ice growth varied by region. Within several thousand years of the point represented here, conditions would become far less hospitable and much of the evidence for earlier landscapes would be sealed beneath or erased by ice.

Thus Ireland around 31,627 BCE was neither a familiar island society nor an empty abstraction. It was a cold, biologically active and unstable Pleistocene landscape: mossy Fermanagh wetlands lay between episodes of glaciation; Cork caves accumulated the remains of animals from open-country ecosystems; and a single marked reindeer bone raises the unresolved possibility of human contact. The scale of the uncertainty is itself part of the history. At this depth of time, Ireland's past survives not in annals or monuments, but in silts beneath drumlins and bones in limestone darkness.

Chapter 075 of 100

31626 BCE

The Reindeer Limb at Doneraile^[75]



31,626 BCE is a modern chronological label, not a year that anybody in Ireland could have named or recorded. There were no written calendars, rulers, states or dated events on the island. Archaeology cannot responsibly identify what happened during this individual year. It can, however, place it within a broad Late Pleistocene setting: roughly 33,600 years before 1950, during Marine Isotope Stage 3, an unstable interval of the last Ice Age. The most relevant Irish evidence consists of fossil bones, freshwater sediments beneath later glacial deposits, and the changing reconstruction of the British–Irish Ice Sheet. Their dates have margins of error measured in centuries or millennia, not days or years.

A Cold Phase in Deep Time

The nearest securely relevant environmental record is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed silts and fine sands trapped between two distinct sheets of till inside a drumlin. Till is sediment laid down by glacier ice. The sequence is therefore remarkable: it records a period when freshwater, plants and small animals occupied ground that had been glaciated earlier and would later again be overridden or sealed by ice. Its original radiocarbon determination, 30,500 +1,170/–1,030 radiocarbon years BP, is not itself a calendar date. Allowing for calibration and uncertainty, it belongs broadly in the middle-to-later part of MIS 3, approximately the 35,000–37,000 calibrated-years-BP range. That span overlaps the broad horizon represented by 31,626 BCE, rather than pinpointing it.

Derryvree's organic beds have been described as a cold-phase freshwater and muskeg environment: a waterlogged landscape with open pools, plant-rich margins and mosses. Poorly preserved pollen was mainly herbaceous, while plant macrofossils and insects indicate tundra or steppe-tundra conditions rather

than woodland. Fossils include cold-adapted taxa such as mountain avens, dwarf willow and arctic-alpine mosses. This does not mean that all Ireland was a single uniform tundra. It establishes what survived at one lowland site in Fermanagh, where water and sediment happened to preserve a fleeting ecological record. Local conditions could have differed greatly with altitude, proximity to ice, drainage, exposure to wind and season.

Ice, Water and Open Ground

Ireland's physical geography was changing rapidly on geological timescales. The island lay within the wider north-west European zone affected by recurring growth and retreat of the British–Irish Ice Sheet. Modern reconstructions agree that the great ice sheet had not yet reached its maximum extent; that came much later, around 26,000 years ago. Yet they also show why a simple picture of an entirely ice-free Ireland is unsafe. Around the transition towards 31,000 years ago, ice was accumulating in northern uplands and glaciers may have occupied high ground elsewhere. Newer work also argues that significant British–Irish glaciation may have begun earlier than once thought. The extent, thickness and exact timing of ice in particular Irish regions remain contested because datable deposits are scarce.

At the horizon relevant to this article, the Irish landscape was therefore probably a mosaic. Some ground supported cold, open vegetation and freshwater habitats, as Derryvree demonstrates. Other areas, particularly uplands and northern sectors, may have been affected by icefields, advancing glaciers, frozen ground or meltwater systems. Summer growth could be brief but biologically productive; winter conditions were severe. The later ice advance destroyed, reworked or buried many earlier surfaces. This helps explain why Ireland has so few surviving Palaeolithic sites compared with parts of Britain and continental Europe. Absence of a campsite is not proof that no person ever arrived, but it does set strict limits on claims for a population.

Lower global sea levels altered coastlines and enlarged some shelves, but they did not automatically create a convenient dry land bridge from Ireland to Britain or the Continent. The Irish Sea basin, local crustal movements, changing ice margins and marine channels all complicate the question. Animal movements show that routes or crossings were possible at intervals, whether over exposed ground, marginal ice, short sea passages or changing coastal corridors. They do not demonstrate a particular route, season or human journey in 31,626 BCE. Any visitor to Ireland would have entered a difficult, shifting frontier landscape rather than a settled island connected by an assured road.

The Castlepook Evidence

The principal possible evidence for people comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. The cave has produced more than two thousand animal bones and is Ireland's richest known Late Pleistocene vertebrate assemblage. Its faunal record includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later cold-stage deposits contain wolf, Arctic fox and lemmings. Individually dated bones span a long period, roughly 45,700 to 19,950 years BP. Castlepook is consequently an archive of repeated animal use and deposition over many millennia, not a sealed snapshot of one moment.

A reindeer femur from the old Castlepook collection has particular significance. It has been reported as dating to about 33,000 years ago and carries deep marks interpreted by zooarchaeologist Ruth Carden as cuts made by a sharp stone implement during carcass processing. If that interpretation is confirmed, it is evidence that a person used a stone edge on reindeer bone in Ireland during the Upper Palaeolithic,

vastly earlier than the traditionally accepted late-glacial human evidence. Around 31,626 BCE, it provides the closest potential human trace. It may reflect the removal of meat, hide, sinew or marrow, but the precise action cannot be recovered from the mark alone.

The cave's evidential limits matter as much as its promise. The femur was recovered from an antiquarian cave collection, not a recently excavated occupation floor with a secure suite of associated finds. A radiocarbon determination dates the death of the animal, not necessarily the instant at which a mark was made, the location where it was hunted or the duration of any human stay. Caves are complicated places: carnivores drag in bones, water moves sediment, people disturb deposits, and excavation methods have changed radically since the early twentieth century. Castlepook also contains evidence of hyaena activity, which is vital for understanding how remains accumulated.

Visitors, Not a Known Community

For these reasons, Ireland cannot yet be said to have had a demonstrated permanent human settlement at this date. There is no securely associated stone-tool assemblage, hearth, dwelling surface, grave, human bone, ornament, cave art or repeatedly occupied camp from Ireland around 31,626 BCE. Nor can the possible visitors be called Gaelic, Celtic or Irish in any ethnic, linguistic or political sense. Those later identities belong to vastly different worlds. The cautious conclusion is narrower but still important: short Upper Palaeolithic incursions into Ireland are possible, and the Castlepook femur may record one episode of reindeer processing.

Elsewhere in Europe, people of comparable age made sophisticated stone tools, travelled through cold environments, organised the sharing of large animal carcasses and, in some regions, created personal ornaments and cave art. That wider evidence makes a brief Irish visit plausible; it cannot fill the Irish gap by itself. No Irish artefact assemblage of this antiquity permits an assigned cultural label, and no local evidence identifies group size, kinship, language, seasonal routine or belief. A hunting party, scavengers exploiting a carcass, or a single small group passing through are possibilities, not established narratives.

Animals and Everyday Survival

Faunal remains nevertheless illuminate the resources and hazards of the landscape. Reindeer were mobile grazers adapted to cold, open country. Mammoths and giant deer indicate that, in suitable periods and places, Ireland could support large herbivores. Wolves and spotted hyaenas reveal an ecological community in which carcasses were contested and caves could be dens, shelters, traps or repositories. Brown bears, foxes, hares and lemmings add further evidence of environmental variety. The presence of a fossil species at Castlepook does not prove that it was widespread across the island or alive in precisely 31,626 BCE; dates must be considered specimen by specimen. Still, the combined record strongly contradicts any image of an empty, featureless frozen waste.

If people did enter, survival would have depended on knowledge rather than any known local infrastructure: reading animal movements, finding freshwater, preserving warmth, carrying portable tools and choosing temporary shelter. Reindeer would have offered meat, fat, hide, sinew and bone, but no Irish evidence reveals how a carcass was divided or shared. There is likewise no basis for identifying trade, exchange partnerships or regular seaborne traffic. Material from the Continent may supply an analogy for Upper Palaeolithic skills, but it is not evidence of commerce in Ireland.

No Politics, No Monuments

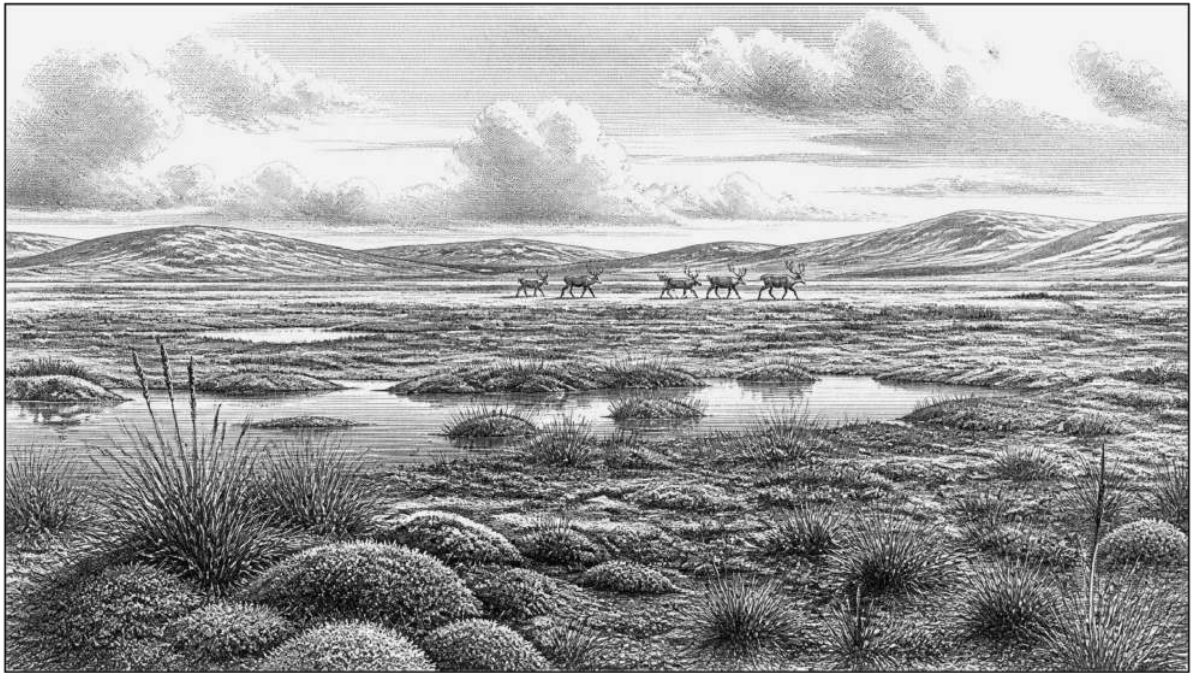
Political affairs, warfare and diplomacy cannot be reconstructed for Ireland at this date. There is no evidence for chiefs, tribes, territorial boundaries, alliances, organised conflict or formal authority. The same restraint applies to religion, learning and culture. No shrine, burial rite, monument, inscribed object or artwork is known from Ireland around this horizon. Natural caves may later invite stories of sacred places, but nothing in the Castlepook material establishes ritual use in the Late Pleistocene. The responsible history is not one of lost kingdoms beneath the ice; it is a history of fragmentary traces and carefully bounded inference.

What can be said is that this was a formative environmental chapter in the deep past of the island. At Derryvree, freshwater life and tundra plants persisted between glacial episodes. At Castlepook, animals repeatedly used or entered a limestone cave system, leaving a record that survived later climatic upheavals. One marked reindeer bone raises the possibility that people, too, briefly reached this northern edge of Upper Palaeolithic Europe. Continued excavation, redating, microscopic study of bone surfaces and analysis of undisturbed sediments may strengthen, qualify or overturn that interpretation. For now, 31,626 BCE is best understood not as a dated Irish event, but as a window onto cold open ground, mobile animals and the tantalising possibility of human passage.

Chapter 076 of 100

31625 BCE

Sedges and Reindeer^[76]



31,625 BCE is not a date that can be recovered as a particular Irish year. Nobody on the island used a calendar, wrote an account, named a ruler or recorded a season in terms recognisable today. The number is a modern chronological label: approximately 33,574 years before AD 1950, the conventional “present” used in archaeological dating. At such depth, even radiocarbon results must be calibrated and expressed as probability ranges. The responsible subject is therefore Ireland during a broad Late Pleistocene interval, rather than an invented event on a precise day or year.

In geological terms, this falls within Marine Isotope Stage 3 (MIS 3), a long, unstable stretch of the last Ice Age. It was before the maximum expansion of the last British–Irish Ice Sheet, which occurred much later, broadly around 27,000–25,000 years ago in the wider Irish sector. Ireland was neither permanently one uniform ice sheet nor a stable, hospitable island. Ice margins, rivers, plant cover and animal ranges changed repeatedly over millennia. The evidence closest to this notional date comes principally from a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh, and from faunal remains in Castlepook Cave near Doneraile, County Cork.

A Window Between the Tills

Derryvree is unusually important because roadworks in 1969 cut through a drumlin and exposed organic silts and fine sands lying between two thick layers of till. Till is the unsorted sediment deposited directly by moving ice. The lower till represents an earlier glacial advance; the upper till a later one. Between them lay the remains of an interval in which ice had withdrawn from, or at least no longer covered, this part of Fermanagh and freshwater conditions developed.

The Derryvree organic series produced a conventional radiocarbon determination of 30,500 BP, with a substantial laboratory uncertainty of $+1,170/-1,030$ years. Modern calibration does not convert that figure into one neat calendar year. Published treatments place its broad calibrated span at roughly 36,900–31,700 cal BP. The modern label 31,625 BCE lies within that broad window, but this must not be mistaken for proof that every plant, insect or waterbody represented in the deposit existed in precisely that year. Derryvree provides a time-depth archive, not a dated snapshot.

Its plant and insect evidence is nonetheless revealing. Freshwater mosses and sedges, together with other cold-adapted indicators, point to open tundra or muskeg-like ground under a periglacial regime. “Periglacial” does not mean covered by glacier: it refers to a severe cold environment shaped by frost, seasonal thaw, sparse vegetation and unstable ground near an ice-dominated world. There may have been shallow pools, sedge marshes, small channels and wetter hollows. Shelter, slope, drainage and season would have created local variation, but there is no evidence for the dense oak, hazel and elm woodland of later prehistoric Ireland.

The landscape around Maguiresbridge was thus not simply a blank field of snow. In the growing season, low vegetation could exploit wet soils and long daylight; in winter, freezing temperatures, wind exposure and limited forage would have imposed formidable constraints. The later ice advance that laid down the upper till sealed this fragile record. That burial is precisely why Derryvree survives and why comparable environmental sequences are so rare. Ice also eroded or redistributed much of the evidence that might otherwise have shown how widely such habitats extended across Ireland.

Cold Change, Not Climatic Stillness

MIS 3 was marked across the North Atlantic by abrupt climatic oscillations, often identified in Greenland ice cores as Dansgaard–Oeschger events. These provide a broad regional framework, not a weather diary for Fermanagh. They show that northern climates could shift markedly on timescales far shorter than an ice age as a whole. In Ireland, such change could alter the balance between ice, meltwater, exposed ground and wetland vegetation, as well as the routes by which animals entered or left the landmass.

It is not possible to draw an exact coastline for 31,625 BCE. Sea level was lower than today because water was retained in continental ice sheets, but the Irish Sea basin had a complex topography and shifting marine conditions. Ireland’s relationship with Britain was not equivalent to the much later, simple image of a dry “land bridge” open to all travellers. Animals and perhaps people may have crossed during favourable phases by routes that are now submerged, interrupted, or poorly understood. The evidence supports connectivity at times; it does not prove a permanent, broad land corridor at this particular point.

This uncertainty matters for regional change. Derryvree demonstrates an ice-free environmental interval in the north-western interior, whereas the cave record from north Cork shows that animals had reached southern Ireland during the middle part of the last glacial cycle. Neither archive can be expanded uncritically into a single all-island reconstruction. Ireland’s topography, proximity to Atlantic weather systems and the behaviour of ice masses ensured that conditions differed between upland and lowland, coast and interior, and from one millennium to another.

Castlepook's Animal Archive

Castlepook Cave, also called Mammoth Cave, lies near Doneraile in north County Cork. Antiquarian excavations and later research recovered a remarkable Pleistocene assemblage from its limestone passages. Reassessment and improved radiocarbon methods have shown that the cave preserves animals from several different phases, rather than one single occupation episode. Direct dates reviewed for its MIS 3 fauna place some remains around 34,000–35,000 years ago, close in broad terms to the date represented here, while the assemblage as a whole extends over a much longer span.

The fauna includes reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings, woolly mammoth, giant deer and spotted hyaena. Not every species need have lived together at the same moment, and a cave collection cannot by itself supply a census of Ireland. Yet the range is powerful evidence that cold-stage animal communities reached the island during suitable intervals. Reindeer in particular fit the open, cold landscapes suggested by Derryvree. Mammoth, hyaena and other large mammals indicate connections with wider north-west European faunal worlds, however intermittent those connections may have been.

A cave is not necessarily where these animals lived or died. It can act as a predator den, scavenger refuge, natural trap, drainage channel and sediment store. Hyenas may have carried bones into passages; water and excavation may have moved them again. This is why animal bones must be read with attention to their individual contexts and dates. Castlepook tells us that Ice Age fauna was present in Ireland, but it cannot reliably tell us the size of herds, the exact rhythm of migrations, or whether its caves overlooked a permanently occupied plain.

The Reindeer Femur Question

The most consequential human clue is a reindeer femur from Castlepook. County Cork heritage material and researchers associated with renewed study of the site have identified a deep mark on the bone as consistent with cutting or chopping by a sharp stone implement while the bone was fresh. The animal has been publicly reported as dating to about 33,000 years ago. If the interpretation of the mark is sustained, it would be potentially very early evidence that one or more Upper Palaeolithic people handled and processed a reindeer in Ireland, within the broad environmental world discussed here.

Its importance requires equal caution. The femur came from an old cave collection, not from a modern excavation of an intact occupation floor. A radiocarbon measurement dates the animal's death within a statistical range; it does not independently date the mark, establish where the animal was killed, or reveal how long any people stayed. Nor has a securely associated stone-tool assemblage, hearth, shelter floor, burial, human bone, ornament or artwork of comparable antiquity been published from Ireland.

The best evidence-based conclusion is modest but significant. A human butchery episode is possible, perhaps involving mobile hunters exploiting a reindeer carcass, but permanent settlement is not demonstrated. The animal could have been hunted, scavenged after a natural death, or taken from a predator kill; the surviving femur cannot decide among these possibilities. Nor can it establish a named culture, a migration route, family ties or descent from later inhabitants. It is a potentially transformative trace, not the foundation for a complete story of "Ireland's first people".

Society Beyond Recovery

There is no evidence from around this horizon for political institutions, chiefs, territories, diplomacy, formal warfare or organised states in Ireland. The same restraint applies to religion, language, art, teaching and ritual. Absence of such evidence does not mean that any visitors lacked social relationships, beliefs, knowledge or stories. It means that archaeology cannot responsibly describe them. A single altered bone and a handful of environmental archives cannot recover ceremonies, kinship rules or spoken traditions.

Economy is knowable only at its narrowest. If the Castlepook incision is human-made, it suggests animal processing: reindeer could have supplied meat, marrow, hides, sinew and bone. That is not evidence for farming, herding, exchange networks, markets or regular trade. There were no crops, domestic livestock, villages or monuments known from Ireland at this date. “Settlement” must likewise remain an open question. The evidence permits a brief visit or visits; it does not demonstrate a resident population, still less continuity through the later glacial maximum.

What can be said with confidence is that Ireland formed part of a changing Ice Age world, periodically accessible to cold-adapted fauna and perhaps, on at least one occasion, to people. Derryvree’s sedges and mosses record an exposed freshwater landscape between glacial advances. Castlepook’s reindeer and other bones record animal lives and deaths within a wider European ecological network. Together they replace a fictitious annual chronicle with something more valuable: a carefully bounded view of a land in transition, where survival depended on climate, movement and opportunity, and where the human record remains no more than a question cut into bone.

Chapter 077 of 100

31624 BCE

Maguiresbridge and Castlepook^[77]



The label 31,624 BCE cannot identify a year of Irish history in the usual sense. No calendar, written testimony, named people or datable event survives from Ireland at this depth of time. Converted only as a modern chronological convenience, it falls roughly 33,573 years before AD 1950, the conventional ‘present’ of radiocarbon chronology. That arithmetic conversion must not be mistaken for archaeological precision. For the Late Pleistocene, evidence is normally dated in calibrated ranges, often spanning centuries or millennia, and the relationship between radiocarbon and calendar years is not a simple subtraction.

This point lies within Marine Isotope Stage 3, a prolonged and highly unstable portion of the last Ice Age. In Ireland it belongs to the Midlandian cold stage, but not straightforwardly to the island-wide Last Glacial Maximum, whose fullest expansion came later, broadly between about 27,000 and 23,000 calibrated years BP in many reconstructions. Around 31,624 BCE, Ireland was a changing borderland of ice, exposed ground, freshwater basins and low sea levels. Its exact appearance differed by region and altered repeatedly over lifetimes and generations.

A Record of Intervals, Not Annals

The most illuminating evidence comes from deposits buried beneath later glaciers. At Derryvree, near Maguiresbridge in County Fermanagh, road works cut through a drumlin and revealed organic silts and fine sands between two distinct sheets of till. This was not a settlement layer. It was the residue of a freshwater environment later overridden and sealed by ice. The deposit produced a radiocarbon determination of 30,500 years BP, with a large laboratory uncertainty of +1,170 and –1,030 years.

Published calibrations express its possible calendar age as a broad interval, approximately 36,900–31,700 cal BP. That range encompasses the modern date-label 31,624 BCE, but it cannot tell us what happened in one particular year.

Derryvree is nevertheless exceptionally important. Its sediments demonstrate that, during part of this cold phase, north-central Ireland had ice-free terrain capable of sustaining ponds, marshy margins and tundra vegetation. The upper till proves that this landscape was subsequently transformed by glacial advance. Rather than offering a continuous narrative, the site gives a before-and-after sequence: freshwater life, burial beneath ice, and eventual exposure by erosion and excavation many thousands of years later.

Other Fermanagh localities broaden the picture without providing an annual timetable. Organic deposits at Greenagho near Belcoo lay beneath till and have been associated with a middle Midlandian interstadial; a conventional radiocarbon result of about 32,460 BP has been treated cautiously and has calibrated broadly to c. 37,200–35,700 cal BP. Hollymount, also near Maguiresbridge, preserves another inter-till freshwater deposit. Together, these sites show that Ireland's late Ice-Age history consisted of repeated climatic and glacial shifts, not one unbroken freeze. They do not justify mapping a single uniform landscape across the entire island in 31,624 BCE.

Tundra Water and Open Ground

The Derryvree plant and insect evidence is the closest direct guide to conditions around this chronological horizon. Its assemblage indicates an open, treeless tundra or tundra-steppe landscape under a periglacial regime: ground subject to prolonged cold, frost action and seasonal thaw rather than dense woodland. Mosses and sedges grew around freshwater; finds including bogbean and mountain avens point to wet, cold-adapted habitats. Such plants do not imply a luxuriant marshland. They suggest shallow water, saturated margins and patches of vegetation within an exposed environment where wind, freezing and short growing seasons shaped what could survive.

'Tundra' should not conjure a flat, identical plain from Donegal to Cork. Ireland's relief, geology and proximity to Atlantic waters would have created local differences. Valleys could hold water and sediment; limestone country offered caves and fissures; uplands were more exposed; and ice margins changed drainage routes. Seasonal snow cover, frozen ground and sparse vegetation were probable features in many places, but the precise temperature, snowfall and ice extent at the target point remain matters of reconstruction rather than observation.

Low global sea level exposed much of the continental shelf around north-west Europe. The modern coastline therefore did not define the land available to animals or people. Yet it would be misleading to picture an uncomplicated grassy bridge from Ireland to Britain or continental Europe. Glaciers, marine basins, shifting shorelines and local relative sea level all complicated the geography. Accessibility varied through time, and the routes that may have existed for large mammals were not necessarily dry, safe or continuously open routes for human groups.

Castlepook's Animal World

Southern Ireland's principal window onto this phase is Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations begun in the early twentieth century recovered a remarkable Pleistocene bone assemblage. Later study and re-dating have shown both the value and

difficulty of the collection: the cave contains evidence of animals from more than one episode, while early excavation methods did not provide the fine-grained stratigraphic control expected today.

Even with that caution, Castlepook establishes that Ireland supported, or was visited by, an Ice-Age fauna. Its records include woolly mammoth, reindeer, giant deer, brown bear, wolf and spotted hyaena. These are not a list of animals all demonstrably standing together in the Awbeg valley on the same day. Some remains may differ in age and some accumulated through carnivore activity. But the assemblage establishes the ecological possibilities of southern Ireland during the later part of MIS 3: large herbivores moving through open country, predators and scavengers following them, and caves acting at different times as shelters, dens, traps or repositories for bones brought in from outside.

Reindeer particularly suit the image of an open, cold-adapted landscape, while mammoth signals the wider north-west European mammoth-steppe world. Their presence does not mean that every part of Ireland was equally favourable. Nor does it make the island an ecological copy of the European mainland. Island geography, fluctuating access and changing ice cover could have made animal populations intermittent, small or locally absent. The surviving bones document occurrences, not stable population totals.

The Human Question

Castlepook has also changed the terms of debate about Ireland's earliest people. A reindeer femur from the old cave collection was reported in 2021 as bearing deep marks consistent with cutting by a stone tool, and its date was publicised as about 33,000 years ago. If the marks are securely anthropogenic, the specimen would be powerful evidence that people reached Ireland during the Upper Palaeolithic, long before the previously accepted late-glacial evidence.

That conclusion remains appropriately cautious. The date belongs to the bone, not necessarily to the instant when a mark was made; one modified bone cannot prove a permanent settlement, identify a cultural group or show that a hunt occurred at the cave. Natural abrasion, carnivore damage, excavation damage and other processes can complicate assessments of marks on old bone. The National Museum of Ireland still notes that no clear evidence has yet established human presence in Palaeolithic Ireland. The responsible position for 31,624 BCE is therefore neither to declare the island certainly empty nor to populate it with an imagined hunting community. Castlepook raises a serious possibility of human activity within the wider period, but the evidence needs continued contextual, taphonomic and dating work.

No Politics, No Proven Settlements

There can be no political history for Ireland at this date in the conventional sense. No kings, chiefs, territories, diplomatic alliances, warfare, laws, languages or religious institutions can be recovered from the evidence. There are no known houses, hearths, campsites, tools in secure context, graves, monuments, cultivated fields or trade goods attributable to Ireland in this particular horizon. Consequently, claims about social rank, kinship systems, ritual practice, learning or exchange would be speculation.

Were people present, the wider European comparison would suggest small, mobile foraging groups whose lives depended on detailed knowledge of animals, weather, fuel, stone and seasonal routes. Such a comparison can help explain why a cut-marked reindeer bone would matter: reindeer offered meat, fat, hide, sinew and bone. It cannot be converted into evidence for an Irish band, a fixed camp at Castlepook, or an inherited local population. Comparison supplies a model, not a fact about this island.

The strongest story for 31,624 BCE is thus environmental and evidential. Fermanagh preserves a freshwater tundra interval enclosed between glacial deposits; north Cork preserves bones from a cold-world fauna and a debated sign of human modification. These fragmentary archives reveal an Ireland that was neither historically silent merely because nothing occurred nor historically knowable in the manner of a later society. It was a landscape repeatedly remade by climate and ice, occupied certainly by animals, and possibly—though not yet beyond dispute—visited by people.

Chapter 078 of 100

31623 BCE

Birm-166's Tundra Record^[78]



A Date Beyond Calendars

31,623 BCE is a modern chronological label, not a year that anyone in prehistoric Ireland could have named, counted or recorded. Expressed in the archaeological convention of years before AD 1950, it lies roughly 33,570 calendar years before present, within the Late Pleistocene and Marine Isotope Stage 3, a climatically unstable part of the last Ice Age. At this depth in time, neither radiocarbon dating nor glacial stratigraphy can resolve Irish history to a single year, season or generation. The responsible approach is therefore to ask what dated deposits can illuminate the broad interval around this point, and what they cannot.

The evidence is exceptionally sparse. Ireland has no securely dated house, hearth, tool assemblage, grave, monument or settlement from this notional year. There are no written sources, named peoples, rulers, territories or institutions. Claims about politics, diplomacy, warfare, formal religion, trade or an enduring population would consequently go well beyond the record. Yet the island was not necessarily an empty white space. Sediments beneath a Fermanagh drumlin and bones from north Cork caves preserve rare, partial evidence for a cold but living landscape before the greatest expansion of the British–Irish Ice Sheet.

The Freshwater Layer at Derryvree

The most useful Irish archive for the broad environmental setting is Derryvree townland, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed an extraordinary sequence: organic freshwater silts and fine sands lay between two thick, distinct beds of till,

the debris left by moving ice. The sequence establishes a relative order with unusual clarity. An earlier glacier had deposited the lower till; a period without local glacier cover then allowed water, plants, invertebrates and sediment to accumulate; later ice buried the deposit beneath the upper till.

A radiocarbon determination, Birmingham laboratory sample Birm-166, gave an age of 30,500 radiocarbon years BP, with a substantial error range. Modern calibration is essential because radiocarbon years are not identical to calendar years. Published discussion places the broad calibrated span at approximately 36,900–31,700 cal BP, or roughly 34,950–29,750 BCE. The nominal date of 31,623 BCE falls within that large range. That overlap permits Derryvree to illuminate the general world of this article, but it does not demonstrate that any particular pond, plant, animal or human action existed in the precise numbered year.

The biological remains indicate open tundra vegetation and a periglacial climate. Pollen, plant macrofossils, mosses and insects point towards wet, mossy ground with sedges, grasses, herbs, low shrubs and shallow pools rather than woodland. The original investigators described a muskeg-like environment: waterlogged, plant-rich terrain broken by open water and damp margins. Winters were severe and the growing season short. Nevertheless, the deposit is important precisely because it records biological productivity. Cold Ireland was not uniformly lifeless, nor was it necessarily covered everywhere by permanent ice.

A Patchwork Rather Than an Ice Blanket

Derryvree must not be turned into a complete map of Ireland. It is one preserved locality in the north of the island, and its sediments accumulated over an interval rather than in a single instant. Conditions in Cork, the west coast, uplands and the Irish Sea basin could have differed substantially. Ice sheets advance, thin, stagnate and reorganise unevenly; local relief affects drainage, shelter and snow retention. Still, Derryvree decisively complicates the older image of Ireland as continuously smothered by ice throughout the later Pleistocene.

The major maximum of the last British–Irish Ice Sheet lay ahead. Large-scale reconstructions indicate considerable ice-sheet growth from about 31,000 years ago, with its maximum overall extent reached much later, around 27,000–23,000 cal BP, although timing differed across regions. Around the horizon represented by 31,623 BCE, Ireland was therefore entering a long transition towards harsher and more extensive glaciation, not standing at the maximum itself. The eventual ice advance both shaped the island's familiar drumlin landscapes and destroyed or disturbed much older ground surfaces. That destructive history helps explain why a thin freshwater bed trapped beneath a drumlin is so valuable.

Castlepook and the Animal World

At Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, excavations and later reassessment have produced Ireland's most important collection of pre-Last Glacial Maximum vertebrate remains. The cave yielded a remarkably varied fauna, including woolly mammoth, reindeer, giant deer, brown bear, wolf, hare, arctic fox and spotted hyaena. Not all bones are contemporary, and cave deposits are difficult archives: carnivores can drag remains into dens; water can move material; early excavations did not meet modern recording standards; and later disturbance can mix deposits. Individual dates and contexts must therefore be assessed separately.

Even with those cautions, Castlepook demonstrates that parts of Ireland supported, or were visited by, a substantial cold-stage animal community over the wider Late Pleistocene. Reindeer and mammoth suggest open grazing country with enough vegetation to sustain large herbivores. Predators and scavengers indicate food chains more complex than modern Irish fauna might imply. Spotted hyaenas should not be imagined as misplaced modern African animals: during the Pleistocene they ranged through cold, open parts of Europe. A cave packed with bone need not have been a hunting camp; it may chiefly record carnivore activity and the chance preservation of carcass remains.

Recent sedimentary ancient-DNA work at Castlepook has added a further line of evidence, detecting taxa not all represented among identifiable bones and linking several faunal lineages to wider western Eurasian populations. This supports the interpretation that Ireland was biologically connected, at intervals, to neighbouring lands before the Last Glacial Maximum. It does not settle the exact route. Lower sea levels altered coastlines, but they did not automatically create a single, dry and easily traversed land bridge between Ireland, Britain and continental Europe. Animal movement may have depended on changing corridors, exposed shelves, short water crossings or combinations of these conditions.

The Limited Human Question

One Castlepook object has particular importance: a reindeer femur in the historic collection has been reported as about 33,000 years old and bears a deep mark interpreted by zooarchaeologist Ruth Carden as damage made with a sharp stone tool while fresh bone was being processed. If that interpretation and association are confirmed through continuing research, it would be evidence that Upper Palaeolithic people handled a reindeer in Ireland during this broad part of the Ice Age. It would push possible human activity on the island far earlier than the long-established record of post-glacial settlement.

It remains a striking but limited item of evidence, rather than proof of a permanent colony at Derryvree, Castlepook or anywhere else in Ireland. No associated stone tools, hearth, dwelling floor, grave or repeated occupation surface has yet been securely recovered from the relevant period. Nor can the femur identify the language, ancestry, numbers or social organisation of the people who may have made the mark. The safest conclusion is that a human visit or brief episode of carcass processing is possible, perhaps increasingly plausible, but continuous settlement cannot presently be demonstrated.

Everyday Life, Without Invention

If people did reach Ireland around this broad horizon, they would have belonged to the Upper Palaeolithic world of mobile hunter-gatherers known elsewhere in north-west Europe. Their survival would have depended on detailed knowledge of animals, weather, fuel, shelter, routes and the seasonal availability of water and plants. Reindeer could have provided meat, hides, sinews, antler and bone; however, no Irish camp has yet shown such a full range of activities. These are reasonable comparisons with contemporary European lifeways, not direct observations from an Irish household.

For the same reason, there is no responsible political narrative. There is no evidence for chiefs, territorial boundaries, alliances, raids, diplomacy or organised war. There is likewise no evidence for shrines, burials, ritual objects, visual art or formal religious practice in Ireland at this date. Caves can gain spiritual significance in later societies, but their use by carnivores or their capacity to preserve fossil bone does not make Castlepook a sanctuary. “Trade” is also the wrong word for the evidence. At most, faunal and possible human movement points to connectivity across the wider north-west European world.

An Archive of Survival

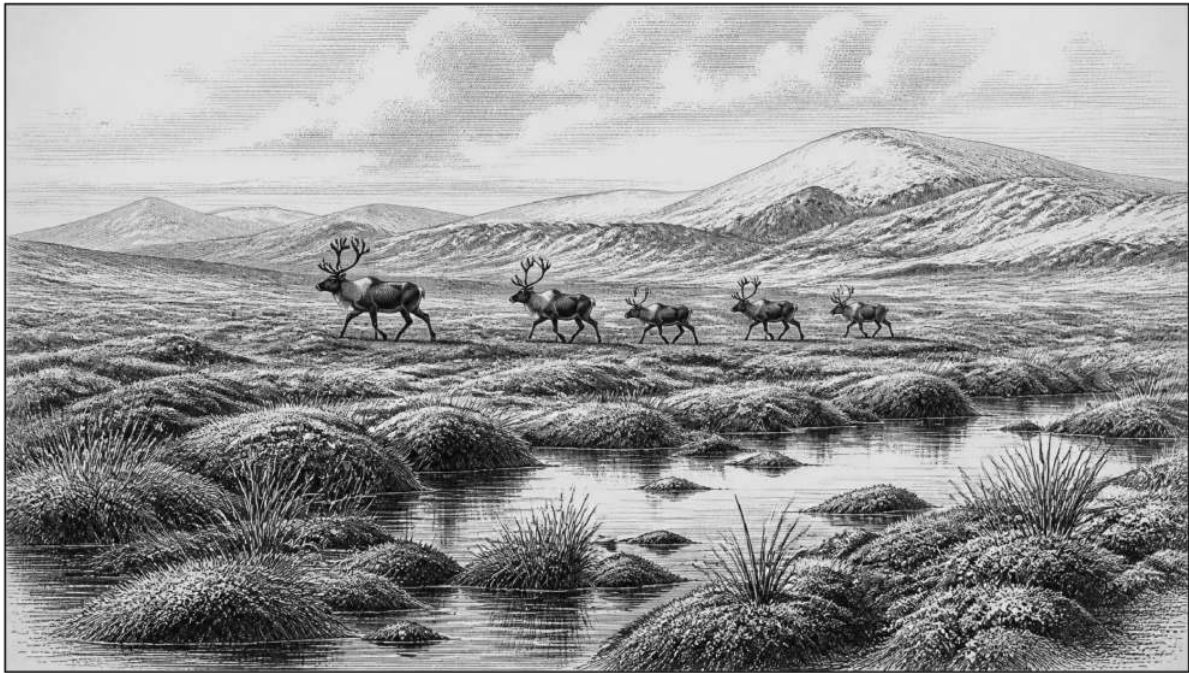
The significance of 31,623 BCE for Irish history lies not in an event assigned to that year, but in the survival of evidence from a period usually erased by ice. Derryvree's freshwater layer shows that a periglacial wetland, with pools and tundra vegetation, existed during an ice-free interval between glacial advances. Castlepook's bones show that cold-adapted mammals formed part of Ireland's Late Pleistocene ecology, while the marked reindeer femur raises an important yet unresolved possibility of early human presence. Together, these archives replace a simplistic tale of an eternally frozen island with one of environmental fluctuation, intermittent habitats and uncertain movement.

They also set a high standard for restraint. Modern calendar precision is unavailable; calibrated ranges, geological relationships and carefully assessed fossils are stronger than dramatic certainty. Ireland around this notional date was a changing Ice Age landscape, perhaps with temporary corridors to a wider world, certainly with plants and animals resilient enough to occupy its cold ground. Whether people were only nearby, briefly present, or absent altogether remains one of the most consequential unanswered questions in Irish prehistory.

Chapter 079 of 100

31622 BCE

BIRM-166 and Castlepook^[79]



The modern label 31,622 BCE cannot be treated as an anniversary in Irish history. No calendar was in use in Ireland, no written record survives, and archaeology cannot isolate an event, community or season to that particular year. Expressed through the convention that counts radiocarbon ages back from AD 1950, it falls approximately 33,600 years before present. That apparent precision is misleading: calibrated results for so remote a period usually span centuries or millennia. The responsible subject is therefore Ireland during a broad interval of the Late Pleistocene, within Marine Isotope Stage 3, rather than a year of identifiable human action.

At this date Ireland lay in a changing north-west European world of cold climates, fluctuating ice margins, exposed continental shelves and mobile animal populations. It was well before the Last Glacial Maximum, conventionally dated to roughly 26,500–19,000 years ago, when the British–Irish Ice Sheet attained its greatest late-Pleistocene extent. The evidence does not support a picture of an island continuously smothered by ice at 31,622 BCE. Nor does it license an imagined landscape of settled Ice Age villages. What survives instead is a demanding but informative combination of buried sediments, cave bones, pollen and plant remains, insects, landforms and laboratory dates.

Dating a Changing Landscape

The most useful Irish evidence close to this broad horizon comes from Derryvree in County Fermanagh. Roadworks exposed organic-rich freshwater silts and fine sands trapped between two separate tills: deposits left by ice, then an interval without local ice cover, then later renewed glaciation. The sample known as BIRM-166 produced a conventional radiocarbon age of $30,500 \pm 1,100$ radiocarbon

years BP. Calibration has placed it broadly between about 36,900 and 31,700 calibrated years BP. The modern date 31,622 BCE falls near the younger end of that wide range; it does not date an observed moment within the deposit.

That stratigraphic position is the crucial fact. Derryvree records a freshwater environment between episodes of glaciation. Plant and insect evidence indicates open, treeless ground, with mosses, sedges, grasses, herbs and shallow pools in a wet tundra or muskeg-like setting. Such evidence can illuminate local ecology and the presence of unfrozen ground and standing water. It cannot supply a national daily weather report, but it decisively complicates the old shorthand that imagines all of Ireland as an unbroken ice sheet throughout the Ice Age.

Other Fermanagh evidence gives the interval depth. Organic material beneath till at Greenagho, near Belcoo, has been calibrated to about 37,200–35,700 years BP. Together, Greenagho and Derryvree indicate that parts of north-central Ireland had ice-free landscapes during the earlier and middle stages of the last glaciation. Crag Cave in County Kerry adds a different kind of record. Its calcite deposits formed episodically during milder last-glacial phases, because dripping water and temperatures permitting liquid water were needed for speleothem growth. These archives show pronounced instability rather than a simple progression from warmth to cold.

Water, Moss and Open Ground

The environment around the date can therefore be described cautiously. In at least some Irish districts there were open habitats rather than closed forest, marked by strong seasonality and cold winters. Wet hollows and pools supported plant communities unlike those that dominate modern lowland Ireland. Frost action, sparse woody cover and periodically saturated ground would have shaped movement across the terrain. Rivers and meltwater channels were potentially important features, while the lower global sea level altered the outlines of the surrounding coasts and exposed areas now beneath the Atlantic and Irish Sea.

Yet Ireland was not environmentally uniform. The Derryvree sediments represent one locality in Fermanagh, and the cave sequences of the south represent another kind of archive. The spread and thickness of ice changed through time; so did the availability of vegetation and animal forage. It is safest to speak of a mosaic of local conditions, bounded by cold and influenced by the wider North Atlantic climate system. The later expansion of the last Irish Ice Sheet was beginning within this long phase, but the evidence does not allow a precise ice margin to be drawn for the calendar label 31,622 BCE.

Castlepook's Animal Archive

In north County Cork, Castlepook Cave near Doneraile preserves the most evocative evidence for Irish life in this wider period. Excavated principally in the early twentieth century, the cave yielded bones of animals including reindeer, woolly mammoth, horse, wolf, bear and spotted hyaena. Modern redating has transformed the significance of the collection. Improved pretreatment of bone collagen showed that some specimens were thousands of radiocarbon years older than dates obtained in the 1990s. The results demonstrate that a varied large-mammal fauna occupied or reached southern Ireland during Marine Isotope Stage 3, before later ice expansion profoundly restricted suitable habitat.

A cave bone assemblage is not, however, a census of animals peacefully living beside its entrance. Carnivores could transport portions of carcasses into a den; water, collapse and sediment movement could rearrange remains; and early excavation methods did not meet modern standards of stratigraphic

recording or recovery. The cave is thus a valuable archive of regional fauna, but not a sealed deposit from one episode. Reindeer are particularly important because their presence accords with open, cold-country grazing landscapes. Mammoth and horse reinforce the point that parts of Ireland could support large herbivores during favourable intervals. Individual species need not all have been present together or at precisely the date under discussion.

The Human Question

Castlepook also presents Ireland's most provocative possible evidence for people at this depth of time. A reindeer femur in the collection has a deep surface mark interpreted by zooarchaeologist Ruth Carden as damage made with a sharp stone tool during carcass processing. The bone has been presented as dating to about 33,000 BCE. If both the date and the interpretation of the mark withstand further scrutiny, it would indicate that humans handled a reindeer in Ireland far earlier than the formerly accepted record of human activity on the island.

That proposition must remain carefully qualified. A radiocarbon measurement dates the death of the animal, not automatically the cutting of its bone, the place where it was killed, or the duration of any human visit. The specimen derives from an old collection rather than a newly excavated and securely stratified occupation surface. No associated stone-tool assemblage, hearth, dwelling, human remains, burial, art or repeatedly used processing floor of comparable age has yet been recovered at Castlepook. Recent excavation has sought to establish whether surviving Pleistocene deposits can furnish stronger contextual evidence. Until such evidence appears, the femur is a significant but limited indication of possible human activity, not proof of a resident population.

The distinction matters for all social questions. There is no evidence for a named people, language, kin group, leader, territory or lineage in Ireland around 31,622 BCE. Nor can archaeology identify political institutions, warfare, diplomacy, trade routes or a formal religious system. If people did reach Ireland, comparison with Upper Palaeolithic communities elsewhere in north-west Europe suggests small, mobile hunter-gatherer groups with sophisticated knowledge of stone, animal behaviour, weather and seasonal terrain. But that is an informed comparison, not a direct portrait of an Irish community. It cannot establish whether visitors crossed once, returned repeatedly, hunted locally, scavenged a carcass, or moved on.

Livelihood Without a Settlement Record

There was no farming, herding of domestic livestock, metalworking, village market or monument-building tradition demonstrated in Ireland at this time. Any human subsistence, if the Castlepook interpretation is accepted, would have depended on wild resources. A butchered reindeer bone could imply the recovery of meat, marrow, hide or sinew, but it cannot reveal the entire diet or seasonal economy. No Irish artefact currently proves exchange with Britain or continental Europe, even though people elsewhere in Upper Palaeolithic Europe maintained far-reaching social and material connections.

Likewise, no direct Irish evidence documents stories, ritual, music, visual art or teaching. This absence should not be mistaken for evidence that people, if present, lacked culture or belief. It marks the survival limit of the record. Caves and wet sediments preserve certain things—bones, pollen, insects, mineral deposits—far more readily than speech, clothing, wooden implements, shelters or acts of memory. The archaeological task is not to fill those silences with imaginary chiefs and ceremonies, but to distinguish securely observed material from reasonable interpretation.

Before the Major Advance

The broader importance of this interval lies in what followed. Reconstructions indicate that the last Irish Ice Sheet expanded from conditions that included substantial ice-free ground around 34,000 years ago, later growing to cover much of the island and adjoining shelves during the Last Glacial Maximum. That expansion remade drainage systems, coastlines and habitats, and probably destroyed or buried many traces of earlier landscapes and any human visits. The scarcity of evidence from 31,622 BCE is therefore partly historical and partly geological: subsequent ice was an agent of erosion as well as a subject of study.

For Ireland at this notional year, the most defensible narrative is accordingly modest but remarkable. Fermanagh preserves evidence of cold freshwater wetlands between glacial episodes. Southern caves preserve animals adapted to an open Ice Age world. Castlepook offers a potentially momentous, but not yet conclusive, sign that people may have processed reindeer there. There were no kingdoms, treaties or recorded events—only a severe, changing landscape and a handful of archives through which its lost inhabitants, animal and perhaps human, can be approached.

Chapter 080 of 100

31621 BCE

Doneraile's Reindeer Butchery^[80]



31,621 BCE is a modern calendar label, not a date at which Ireland can be observed year by year. There are no written records, settlements, graves or securely dated human occupations that can be assigned to that single year. In archaeological terms it falls at roughly 33,600 calibrated years before present (cal BP, where “present” is AD 1950), during the later part of the Late Pleistocene, or Ice Age. The responsible approach is therefore to examine broad calibrated ranges and the few surviving Irish deposits that illuminate this phase, rather than inventing an event for a precise calendar year.

At this horizon, Ireland lay within Marine Isotope Stage 3 (MIS 3), an exceptionally changeable interval of the last glaciation. It was not yet the climatic nadir known as the Last Glacial Maximum, when the British–Irish Ice Sheet expanded dramatically across Ireland and its shelf. But conditions were cold, landscapes were unstable, sea level was much lower than today, and the extent of ice, open ground and water altered repeatedly. A nominal date in the 31,620s BCE must consequently be treated as an approximate point within a long environmental history rather than as a historical anniversary.

A Landscape Between Ice Advances

The most informative Irish environmental archive for this general period is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed fine sands and organic freshwater silts lying between two distinct sheets of glacial till. The sequence is important because it records order: ice deposited the lower till; an interval without local ice allowed water, sediment and plant remains to accumulate; then a later advance sealed the deposit beneath the upper till.

Organic material from Derrynvree produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty. When calibrated, scholarship places the deposit broadly at c. 36,900–31,700 cal BP. The modern year-label 31,621 BCE, roughly 33,600 cal BP, falls within that wide interval, but it cannot be pinned to a particular layer, season or generation at the site. The deposit is evidence for a cold, ice-free or locally ice-free phase in this part of northern Ireland; it is not proof that all of Ireland had the same conditions at the same moment.

Derrynvree's plant and insect evidence indicates open, treeless, periglacial ground. Mosses, sedges, herb pollen and the fossil seed of bogbean point to wet hollows, pools and muskeg-like vegetation within a wider tundra landscape. Dry ground was probably sparse, exposed to frost and wind, and low in plant cover. A few grains of tree pollen do not demonstrate local woodland: pollen can travel long distances, while the pollen itself was poorly preserved. The evidence is strongest for a mosaic of damp freshwater habitats and open cold-country vegetation, not for a uniform frozen desert.

Crag Cave and the Rhythm of Climate

South-west Ireland offers another, differently measured record. Uranium-thorium dates from broken and reworked calcite formations in Crag Cave, County Kerry, show that stalagmite growth occurred episodically during MIS 3. Calcite formation in this shallow cave required liquid water and conditions generally warmer than persistent annual freezing. Its repeated growth and interruption provide independent support for the idea that Ice Age Ireland experienced abrupt shifts between relatively milder interstadials and much harsher stadials.

This does not allow a precise weather report for 31,621 BCE. Yet it matters because it corrects an older image of the Ice Age as one unchanging deep winter. Temperatures, soils, vegetation and the availability of running water could change markedly over centuries or millennia. The contrast between Derrynvree's cold freshwater tundra and periods of cave-calcite growth in Kerry is best understood as evidence for a dynamic island-edge environment, strongly affected by North Atlantic climate oscillations.

Castlepook's Animal World

The richest Irish archive of animals from before the Last Glacial Maximum is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Its narrow limestone galleries and larger chambers yielded extensive bone assemblages during excavations in the early twentieth century. The cave contained remains of woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, Arctic fox, mountain hare and lemmings. These animals do not all belong to one moment. Radiocarbon dates show that bones accumulated across a long span of the middle and later Ice Age, and water movement later mixed parts of the deposits.

That cave history sets a necessary limit on certainty. Castlepook is compelling evidence that Ireland formed part of a wider north-west European faunal zone before the major ice expansion. It is not a neatly stratified camp-site. Some animals may have fallen into cavities; carnivores, especially hyaenas, probably dragged carcass parts into dens; water then redistributed material. The presence of mammoth or hyaena bone proves neither a mammoth hunt nor human use of the cave. It does, however, show a more varied and formidable animal community than the later, post-glacial Irish fauna.

Recent sedimentary ancient-DNA work at Castlepook reinforces the wider picture, identifying a range of Late Pleistocene animal taxa and genetic links between Irish fauna and Eurasian populations. It suggests that the island's megafauna were not necessarily isolated relics but belonged to populations

connected, intermittently, with Britain and continental Europe. The routes changed with sea level, ice and exposed shelf terrain. At this date, the evidence cannot settle whether particular movements used continuous dry ground, ice margins, coastal corridors or water crossings. It does show that the modern shoreline is a poor guide to the Ice Age geography through which animals moved.

The Reindeer Bone and Human Presence

The most consequential human question arises from a reindeer femur fragment in the Castlepook collections. Re-examination identified a deep mark interpreted by zooarchaeologist Ruth Carden as a cut made with a sharp stone tool during carcass processing. County Cork heritage material has presented the bone as dating to about 31,000 BC, and public reporting has described it as evidence of human activity in Ireland around 33,000 years ago. If that interpretation is sustained by further analysis, it would indicate that people reached Ireland far earlier than the previously secure terminal-Pleistocene evidence.

Nevertheless, the claim must remain carefully bounded. The find is a single modified bone from an old excavation, not a recovered hearth, stone-tool assemblage, dwelling floor or cemetery. Castlepook's complicated sediment history makes association difficult, and public accounts of an age do not substitute for a fully published, specimen-specific calibrated range with modern laboratory detail. The mark is significant precisely because it may be humanly made; it cannot support confident claims about a permanent population, its language, identity, numbers or political organisation. Current fieldwork and re-study of the cave have been designed to improve the chronology, sedimentary context and biological evidence.

Life, Society and Absence

If people did visit Ireland in this interval, the most defensible model is of highly mobile Upper Palaeolithic foragers moving through a cold, seasonal landscape and drawing on social knowledge extending beyond the island. Reindeer would have offered meat, fat, marrow, hides, sinew and bone; other large herbivores could also have been attractive resources. But that is an ecological inference from comparable hunter-gatherer economies and from the apparent butchery mark, not direct evidence of a local Irish band, hunting strategy or camp.

There is no basis for identifying rulers, territories, diplomacy, wars, tribal names, trade goods or organised religion in Ireland at 31,621 BCE. Nor are there known Irish artworks, inscriptions, monuments or formal burials from this horizon. "Culture and learning" can be discussed only at the most basic level: any successful visitors would have possessed sophisticated practical knowledge of stone edges, animal bodies, changing terrain, shelter and routes. Such knowledge would have been social and learned, but it has not survived in identifiable Irish artefacts from this date.

The economy, likewise, was not agriculture or trade in the later sense. There were no farms, fields, livestock or permanent villages evidenced in Ireland. The relevant economy was one of wild resources, mobility and risk management. Caves such as Castlepook were not necessarily homes; in the animal record they were often traps, dens, repositories and geological mixers. The strongest conclusion for Ireland around this modernly numbered year is therefore modest but remarkable: during an unstable pre-maximum Ice Age interval, parts of the island supported cold-adapted plant and animal communities, and one controversial but potentially transformative reindeer bone may preserve a trace of human handling.

Much was then still to change. The Last Glacial Maximum would erase or bury many earlier land surfaces beneath expanding ice, helping to explain why the archaeological record is so thin. Ireland's history at this depth is not a sequence of named events. It is a history recovered from silts under a drumlin, calcite in a cave, bones in limestone passages and a single marked reindeer limb—evidence powerful enough to widen the past, but too fragmentary to turn 31,621 BCE into a conventional year of history.

Chapter 081 of 100

31620 BCE

The Derryvree Drumlin Section ^[81]



The label 31,620 BCE is a modern way of locating a point very deep in the past, not a year that anyone in Ireland recorded or could have recognised. It is approximately 33,570 years before AD 1950, the reference point used for calibrated radiocarbon ages. At that distance, archaeology cannot distinguish one calendar year from the next. The responsible history is therefore of a broad interval around this notional date: later Marine Isotope Stage 3, within the Midlandian cold stage of Ireland's Pleistocene. Its evidence is indirect and uneven—buried wetland sediments, cave bones, pollen and plant remains, insects, cave calcite, ice-sheet landforms and radiocarbon measurements—not documents, monuments or settlements.

That distinction matters. A calibrated range is not an event date. Radiocarbon ages require conversion because atmospheric carbon-14 has varied through time, and the calibration curve itself incorporates uncertainty. At Derryvree, County Fermanagh, an organic freshwater layer produced a conventional determination of 30,500 radiocarbon years BP, with a large error margin; published calibration places it broadly about 36,900–31,700 calendar years BP. The modern year-label falls within that wide window, but it cannot identify a particular season, generation or occurrence at Derryvree.

A Wetland Beneath the Till

Derryvree, two kilometres north-east of Maguiresbridge, is the most revealing Irish environmental archive for this part of the last Ice Age. Road works in 1969 cut through a drumlin and exposed fine sands and organic silts trapped between two thick, distinct sheets of till—sediment laid down directly by or close to glacier ice. The layered sequence preserves an extraordinary proposition: after an earlier ice advance but before a later one, freshwater accumulated here long enough for plants and small animals to leave a record. The younger glacier then sealed that record inside the drumlin.

The original investigators identified a flora and fauna of full-glacial character. Plant remains, pollen and insect evidence indicate an open tundra or tundra-like landscape, with wet, organic ground and pools rather than woodland. The phrase should not summon an unbroken plain of snow. It describes a sparse, cold-adapted mosaic: sedges, mosses, herbs and low shrubs around waterlogged patches, with exposed mineral ground and seasonally severe conditions. The insect assemblage has been interpreted as compatible with muskeg—a mossy, plant-rich wetland with open pools. This was a living landscape, but a demanding one, shaped by frozen ground, meltwater and a very short productive season.

Derryvree is evidence for local ice-free conditions while those freshwater beds formed; it is not a map of all Ireland. Nor does the lower till prove that every part of the island had been ice-covered at the same moment. Ice sheets were dynamic, with centres, margins and corridors responding differently to topography and North Atlantic climate. The later till does, however, show that the Derryvree wetland belonged to an interrupted history of glaciation. Its landscape was eventually overridden or enveloped by ice and reshaped into the drumlin visible today.

Before the Greatest Expansion

At around 33,570 calibrated years BP, the climactic maximum of the last British–Irish Ice Sheet was still ahead, although the route towards it was neither simple nor uniform. Modern reconstructions place major growth and advance during the succeeding millennia, while offshore and onshore evidence shows that different sectors could advance, retreat, stagnate or reorganise at different times. Work on the western margin indicates shelf-edge glaciation by about 27,000 years ago; research in southern Ireland demonstrates that much terrain once assigned to much older glaciations was also affected during the last glacial maximum.

For this earlier period, it is safest to envisage regional change rather than an island either wholly ice-bound or wholly open. The Derryvree sediments show that a cold freshwater environment existed in Fermanagh within the dated span. Crag Cave in County Kerry supplies a different kind of clue: uranium-series dating of its calcite formations shows episodic water flow in south-west Ireland through much of Marine Isotope Stage 3. Because calcite growth in this shallow cave required liquid water and conditions broadly above the freezing threshold, it confirms that the last glacial climate on Ireland's Atlantic edge fluctuated substantially on millennial scales. It does not tell us that Derryvree and Crag Cave experienced identical weather in the same year, but it cautions against treating the Ice Age as climatically static.

Coastlines, too, were unlike those of modern Ireland. Global sea level was lower during the glacial period, exposing portions of the surrounding continental shelf, while ice, crustal movement and sea-level change continually altered routes across the Irish Sea region. Whether a usable land connection existed at any particular moment is a specialised and contested palaeogeographical question, not something that can be read from a modern map. For animals and any people, access depended upon shifting combinations of sea, ice, exposed shelf and local terrain.

Castlepook and the Animal Record

Far to the south, Castlepook Cave near Doneraile in north County Cork preserves the most important faunal archive relevant to Ireland around this broad horizon. Antiquarian excavations in the early twentieth century recovered a large, but imperfectly documented, collection from its chambers. Later work by the Irish Quaternary Fauna Project used accelerator radiocarbon dating to establish that mammals

had reached Ireland during the late Pleistocene. More recent redating, using improved pretreatment of bone collagen, found that several Castlepook results were thousands of radiocarbon years older than earlier determinations suggested.

The cave's pre-last-glacial-maximum fauna includes reindeer, woolly mammoth, giant deer, brown bear and spotted hyaena, alongside smaller cold-adapted species. These names offer a powerful corrective to the familiar green and wooded image of Ireland. They demonstrate that, during parts of Marine Isotope Stage 3, large mammals characteristic of open, cold European environments reached the island or its changing margins. Yet the assemblage must be handled carefully. A cave is not a census of a single valley on a single day. Carnivores could drag prey or scavenged remains underground; bones from different episodes may be mixed; and many early excavations removed sediment before modern stratigraphic recording existed. The list demonstrates regional faunal possibilities across a long span, not a guaranteed simultaneous community in 31,620 BCE.

Spotted hyaena is especially significant because a denning or scavenging carnivore helps explain why caves can contain concentrations of bones. Castlepook therefore records ecological relationships as well as species: large herbivores moving through open country, predators and scavengers exploiting carcasses, and caves acting as traps, shelters or bone accumulators. Mammoth remains should not be turned into claims for a settled 'mammoth-hunting' society in Ireland. They are evidence that mammoths occurred in the wider faunal history of the site, not proof of a local human hunting economy.

The Human Question

A reindeer femur from Castlepook has made this period newly important for Irish archaeology. Its incision has been interpreted as a cut mark made by a sharp stone tool, consistent with butchery. The bone has been presented as dating to about 33,000 years ago, and the possibility is consequently that Upper Palaeolithic people briefly visited or hunted in Ireland during a relatively favourable interval of the last Ice Age. If that interpretation is sustained, it would greatly extend the evidence for human activity on the island.

But it remains a limited inference, not the foundation for a detailed social history. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, art, food-preparation area or repeatedly occupied camp of this age has been demonstrated in Ireland. The reindeer bone was recovered from a cave archive shaped by early excavation and animal activity; the date of the bone cannot by itself date the cutting episode to a modern calendar year. It is therefore not responsible to name a group, assign an Aurignacian or Gravettian identity, reconstruct a household, or describe ritual from Irish evidence alone. Current excavations at Castlepook seek precisely the contextual evidence—charcoal, lithics, further modified bone and stratified deposits—that could test the case.

What Cannot Be Written

There were no recoverable political institutions, rulers, treaties, wars, diplomatic contacts, markets, religious sites or systems of learning in the evidence for Ireland at this point. That is not a judgement on the capacities of possible human visitors; it is a statement about the record. Mobile hunter-gatherers elsewhere in Upper Palaeolithic Europe possessed sophisticated knowledge, social ties and technologies, but comparison cannot fill Irish gaps with imagined camps, trade routes or beliefs. The only defensible

economic observation is ecological: any short-lived human presence suggested at Castlepook would have depended on the movement and processing of wild resources, particularly large animals, in a cold and unstable landscape.

The absence of settlements is also partly a product of preservation. Later ice eroded and reworked extensive surfaces, while rising seas changed or submerged parts of the surrounding shelf. Portable tools and brief open-air camps are intrinsically difficult to find; caves and sediments sealed beneath till are exceptional survivors. Consequently, silence is not proof that no person ever crossed this landscape. It is proof that the evidence presently available cannot establish continuous occupation, population size or everyday practice.

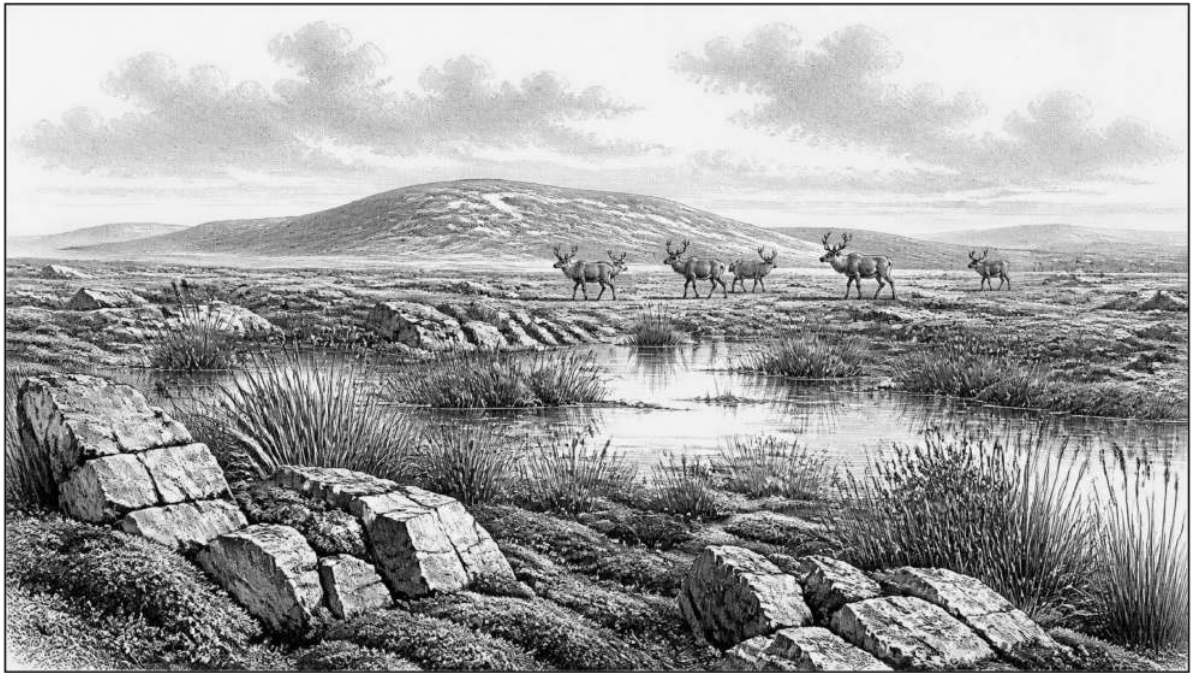
An Archive of Intervals

Ireland around the modern label 31,620 BCE is best understood as an archive of intervals rather than an annalistic year. Derryvree offers a cold wetland enclosed between glacial episodes; Castlepook reveals a changing fauna of reindeer, mammoth, deer, bears and hyaenas; Crag Cave records climatic pulses through the survival of calcite; and a single altered reindeer bone raises, without settling, the prospect of very early people. Together they show that Ireland was neither timelessly frozen nor securely peopled. It was a variable north-western landscape in which water, frost, ice, animals and perhaps small mobile human parties repeatedly altered the possibilities of life.

Chapter 082 of 100

31619 BCE

Castlepook's Open Hinterland^[82]



31,619 BCE is not a date to which Irish prehistory can be pinned with calendar-year accuracy. No people then living could have used such a year-number, and neither archaeological deposits nor radiocarbon results isolate an event to it. It is best treated as a modern reference point, roughly 33.6 thousand calendar years before the 1950 baseline used for radiocarbon chronology. It falls within the Late Pleistocene, during Marine Isotope Stage 3: a cold, climatically volatile part of the last Ice Age, long before Ireland's final glacial maximum. What can responsibly be said concerns ranges, deposits and changing environments rather than a named person, battle, settlement or political act.

A Landscape in Transition

At this broad point in time, Ireland was not yet the thoroughly ice-covered landscape of the Last Glacial Maximum, conventionally placed at about 26.5–19 thousand years ago. Evidence from beneath later glacial deposits indicates that parts of the island remained ice-free during earlier phases of the last glaciation. A study of the Irish ice sheet's development concludes that the bulk of the final ice expansion began from largely ice-free conditions around 34,000 years ago and only reached the south coast much later. That is an important qualification: around the notional year 31,619 BCE, advancing and locally persistent ice, snowfields, frozen ground, waterways and exposed terrain may all have mattered, but their precise arrangement cannot be mapped year by year.

The island's modern outline is also misleading. Global sea level was substantially lower during the Ice Age, and the coasts lay far beyond many present shorelines. Yet lower sea level does not automatically prove a simple dry-land route into every part of Ireland. The Irish Sea basin, changing ice margins, rivers, estuaries and seasonal sea ice created a shifting geographical threshold. For animals, and perhaps for

occasional human visitors, access could have varied greatly by route and by century. The evidence does not warrant a confident picture of a permanent land bridge, still less a regular migration corridor used by settled communities.

The strongest environmental window comes not from a single place in 31,619 BCE but from deposits whose calibrated ranges overlap this broad period. At Derryvree near Maguiresbridge in County Fermanagh, roadworks exposed organic silts and fine sands trapped between two substantial sheets of till. The original radiocarbon result, Birm-166, was 30,500 radiocarbon years BP, with a sizeable uncertainty; later calibration places it broadly around 36.9–31.7 thousand calendar years BP. That range encompasses the modern reference year in this article, but it must not be mistaken for proof that its plants and animals lived in one particular calendar year.

Derryvree's Tundra Wetland

Derryvree nevertheless preserves unusually vivid evidence for the kind of environment that could exist in northern Ireland before the last major ice advance. Its plant and animal remains indicate open tundra and a periglacial regime: ground shaped by severe frost, seasonal thaw and short summers rather than woodland. Grasses and sedges were important, with juniper and herbs, mosses and wetland plants. Fossil remains of bogbean and mountain avens are especially revealing. Bogbean suggests standing or slow-moving freshwater in a cold marshy setting; mountain avens points towards open, cold-adapted vegetation. These are direct environmental observations from the deposit, not names for a vanished 'Derryvree people'.

Such a landscape was not an empty white wilderness. It probably combined frost-shattered slopes, thinly vegetated ground, sedge-rich hollows, pools, rivulets and sheltered patches where plants could grow during a brief season. Insect evidence from another Irish Middle Midlandian locality, Aghnadarragh, has been interpreted as indicating sparse open vegetation and markedly cold winters; estimates published for that assemblage give mean July temperatures of approximately 11–13°C and mean January temperatures from about –18 to –7°C. Those figures are a regional palaeoclimatic reconstruction, not a thermometer reading for Derryvree or for 31,619 BCE itself. They do, however, convey the scale of climatic hardship under which Irish ecosystems functioned.

Regional variation matters. Fermanagh's freshwater silts record a lowland wetland caught between ice advances; cave deposits in north Cork preserve animals accumulated over long and complicated periods; mountain evidence records still different conditions. No single pollen list or bone assemblage can stand for the whole island. The responsible general picture is therefore an open, cold and heterogeneous Ireland, with potentially habitable refuges and corridors in some areas but with conditions liable to alter rapidly as climate fluctuated and the Irish Ice Sheet gathered strength.

Castlepook's Faunal Record

For the animal world of this period, Castlepook Cave near Doneraile in north County Cork is indispensable. Often called Mammoth Cave, it has yielded Ireland's richest known pre-Last Glacial Maximum cave fauna. Woolly mammoth, reindeer, giant deer, brown bear and spotted hyena are represented there; later cold-stage remains include Arctic fox, wolf and lemmings. This range demonstrates that Ireland was reached, at different times, by a far more diverse Pleistocene fauna than the island supported after post-glacial separation. It does *not* demonstrate that every species shared the Awbeg Valley at the same moment, or that a visitor in 31,619 BCE could have seen them all together.

The cave itself was a repository, not a straightforward prehistoric camp. Carnivores could drag in parts of carcasses; scavengers gnawed bones; water shifted material; and early twentieth-century excavations did not meet modern standards of stratigraphic recording. Thousands of bones reportedly came from the cave system, but only a portion entered museum collections. The surviving material is consequently precious but difficult. Modern re-dating has shown that some older radiocarbon determinations from Irish cave collections require reassessment because improved pretreatment methods can remove contaminants that make specimens appear too young. Castlepook's chronology has therefore become more informative, but also more clearly complex.

Reindeer are central to any reconstruction of this open country. They could exploit sparse tundra vegetation and were part of wider north-west European animal movements during cold phases. Mammoth remains imply the availability, at least episodically, of productive open habitats on a large scale; spotted hyenas indicate a predator and scavenger ecology capable of transporting bones to caves. Giant deer, wolves, bears, hares and small mammals each add to the impression of an interconnected food web. But an assemblage of bones is evidence first for species presence and depositional processes. It only cautiously supports broader interpretations of herd movement, seasonal use of valleys or changing predator territories.

The Human Question

Castlepook is also associated with the most debated possibility for a very early human presence in Ireland. A reindeer femur from the old collection has been described by zooarchaeologist Ruth Carden and by County Cork heritage authorities as bearing a deep mark consistent with cutting fresh tissue using a sharp stone edge. The specimen has been presented as dating to about 31,000 BCE, close enough to the period considered here to be historically striking. If that interpretation is upheld, it would indicate that people butchered a reindeer somewhere in the north Cork landscape during the Late Pleistocene. It would not establish that the cave was a home, that hunting occurred inside it, or that Ireland contained a continuous resident population.

The distinction is fundamental. The bone's age dates the animal, while identifying an incision as a stone-tool cut is a separate zooarchaeological judgement; the cave's disturbed collection history adds another layer of caution. A carcass may have been processed elsewhere and a discarded limb bone later taken into the cave by hyenas or wolves. Nor have securely associated Palaeolithic stone tools, hearths, shelters, burials or repeated occupation surfaces been recovered from Castlepook. Current work has identified surviving Pleistocene-bearing deposits and offers the prospect of better-controlled evidence, but the famous reindeer femur remains a small and exceptional trace, not a complete settlement archive.

Accordingly, no political history can be written for Ireland at this date. There is no evidence for rulers, tribes with recoverable names, territories, warfare, diplomacy, law or institutions. There is equally no direct Irish evidence for ritual practice, art, formal learning, trade networks or language. If people did reach the island, the most restrained inference is that they were probably members of small, mobile Upper Palaeolithic hunting groups familiar with stone cutting tools and able to operate in cold, open environments. That inference derives from the marked-bone claim and from comparison with continental Europe; it is not evidence for a distinct Irish society.

Economy Without Settlements

In this setting, 'economy' means subsistence rather than markets. Reindeer offered meat, fat, hide, sinew, bone and antler; large herbivores and smaller game could have supplied other resources. Yet there is no Irish assemblage from around this date that permits a confident account of hunting strategy, seasonality, food sharing or tool manufacture. The idea of groups following herds is plausible, particularly in a continent where mobile hunter-gatherers were well established, but it remains interpretation in Ireland. There is no sound evidence for farming, domesticated animals, pottery, metalworking, exchange goods or permanent villages.

What survives instead is a fragile conjunction of scientific records: silts beneath a Fermanagh drumlin, plant macrofossils and pollen, cave bones from north Cork, tooth and gnaw marks, modern radiocarbon recalibration, and the geomorphological scars of later ice. These sources illuminate environmental possibility far better than human biography. They show that portions of Ireland, shortly before final glacial expansion, could support freshwater wetlands, tundra vegetation and substantial mammals. They also show why the archaeological record is so sparse: subsequent ice, erosion, sea-level change and antiquarian excavation have removed, buried or mixed much evidence.

For 31,619 BCE, then, the defining Irish development was neither a recorded event nor a political turning point. It was the existence of a cold but living landscape on the threshold of profound glacial change. Derryvree gives that world a wetland texture; Castlepook gives it animal life and a tantalising, unconfirmed human dimension. The historical value of the period lies precisely in that restraint. Ireland's earliest possible visitors, if they came, left no story in words. They may have left only a cut on a reindeer bone amid the far larger record of ice, water, plants and animals.

Chapter 083 of 100

31618 BCE

Derryvree's Alpine Clubmoss^[83]



31,618 BCE is a modern chronological label, not a date that can be matched to a recorded Irish event. No calendar, writing system, named community or political institution existed in Ireland at this depth of time, and archaeology cannot responsibly isolate a single year. In radiocarbon convention, the date lies about 33,567 years before AD 1950, within the later part of the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). The evidence instead provides overlapping time-ranges: a cold, unstable environment; animal remains from caves; and a small, disputed indication that people may briefly have reached the island.

Intervals Rather Than Annals

The most directly relevant Irish environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two distinct sheets of glacial till. The order of these layers is important. Ice had deposited the lower till; later, in an interval without local glacier cover, water and organic sediment accumulated; renewed glaciation then laid down the upper till and sealed the deposit. This is not a historical episode in the usual sense, but it is a remarkably clear record of regional environmental change.

Organic material from the Derryvree deposit produced a conventional radiocarbon determination of 30,500 years BP, with a substantial error range. Later calibration places the relevant horizon broadly at about 36,900–31,700 calibrated years BP. The nominal year 31,618 BCE falls within that broad bracket, but cannot be identified as a particular layer, season or generation within it. The same caution applies to every date used here: a scientific age estimate allows an archaeological interval to be discussed; it does not create an Ice Age diary.

The plant and animal evidence from Derryvree indicates open tundra vegetation and a periglacial climate. Fossils include dwarf willow, lesser clubmoss and alternate water-milfoil. Together they point to a landscape with low-growing plants, wet ground and shallow freshwater, rather than the dense woodland now associated with Ireland. Sedges, grasses, herbs, mosses and small shrubs could thrive in sheltered or damp places, while frozen or seasonally frozen ground constrained drainage and soil development. This was not necessarily an unbroken, snow-covered waste. Even in a severe climate, ponds, springs, stream margins and sun-facing slopes created local contrasts in shelter, moisture and food.

An Island Before the Maximum Ice

Ireland at this time stood within the long Midlandian cold stage, but before the later maximum expansion of the British–Irish Ice Sheet. The precise history of the ice sheet remains an active subject of research. Some evidence indicates substantial earlier ice growth and fluctuating margins during MIS 3; other sequences demonstrate that areas of north-central Ireland were ice-free during part of this interval. The Derryvree and Greenagho deposits in Fermanagh are particularly significant because their freshwater sediments survived beneath later glacial deposits.

The responsible picture is therefore regional and changing, rather than one of an island uniformly buried under ice. Around the broad horizon represented by 31,618 BCE, portions of Ireland could support terrestrial and freshwater ecosystems, while glaciers, ice fields and meltwater systems influenced other districts or advanced and retreated through time. The familiar pattern of drumlins, scoured rock and glacial sediment visible across the modern country was still being made and remade. Later ice would alter valleys, strip soils, transport boulders and bury evidence of earlier landscapes.

Climate also changed rapidly on the scale of millennia and centuries during MIS 3. A warmer interstadial could encourage vegetation, animals and perhaps human movement into exposed northern lands; renewed cold could reduce plant cover, freeze ground and enlarge ice masses. It is not possible to assign an annual temperature or a single coast-line to 31,618 BCE. Sea levels were lower than today because much water was held in continental ice, but Irish approaches remained a complicated mixture of land, sea, shallow shelf and glaciated terrain. No evidence from this date demonstrates a permanent land connection, regular seafaring or a dependable route between Ireland and Britain or continental Europe.

Castlepook's Animal Archive

The richest evidence for the broader Irish animal world comes from Castlepook Cave near Doneraile, County Cork, in the Awbeg valley. Excavations beginning in the early twentieth century recovered more than 2,000 bones from its galleries. Direct dates from individual specimens span a long period, roughly 45,700 to 19,950 years BP. That range is far too wide to make the cave a single deposit or a direct portrait of one moment, but it establishes Castlepook as Ireland's foremost archive of fauna leading towards the Last Glacial Maximum.

Its Ice Age assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, as well as wolf, Arctic fox, mountain hare, stoat and lemmings in later cold-stage material. These animals did not necessarily all occupy the same valley at the same time, nor does their presence mean that every species was widespread across Ireland. Cave assemblages are selective records: carnivores drag in carcass parts, animals die in or near entrances, water moves bones, and early excavation can disturb their original relationship. Nevertheless, the collection demonstrates that Ireland was periodically accessible to a far richer large-mammal fauna than the modern island supports.

For living animals, the open country suggested by the Fermanagh flora would have offered different opportunities. Reindeer could exploit tundra plants and seasonal grazing; predators and scavengers could follow herbivore movements; caves and rocky ground provided shelter or dens for some species. Mammoths and giant deer belong to the wider ecological setting, but their remains should not be turned into a neat food-chain tableau. Each specimen has its own age, depositional history and uncertainty. The safe conclusion is that suitable habitats existed in Ireland during parts of MIS 3, allowing cold-adapted and open-ground mammals to move through the region.

A Reindeer Bone and a Cautious Claim

Castlepook also matters because a reindeer femur fragment in the National Museum of Ireland's Natural History collections has been reported as approximately 33,000 years old and as bearing a deep mark interpreted as having been made by a sharp stone tool while fresh tissue was being removed. If that interpretation is confirmed, it would be evidence that a person or very small group processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted evidence for human presence.

The qualification matters. A directly dated bone gives the age of the animal, not necessarily the instant at which a mark was made. Determining whether a groove came from a lithic edge, carnivore damage, trampling, sediment abrasion, breakage or old excavation requires careful taphonomic and microscopic study. Moreover, Castlepook's historical collections derive from complex cave contexts affected by water, carnivores and earlier digging. Recent excavation has located surviving sediments, but has not yet supplied an undisturbed Upper Palaeolithic occupation surface that securely associates people, tools and fauna.

Thus the reindeer bone is best treated as a significant and testable clue, not as proof of a village, a permanent population or a named culture. It cannot establish whether people hunted the animal locally, scavenged a carcass, arrived in a single short visit, or returned repeatedly. No human skeletal remains, hearth, stone-tool assemblage, dwelling, burial, art or securely dated camp is known from Ireland for this precise broad period. The stronger claim is also the narrower one: there may be evidence of human handling of a reindeer, but the scale and duration of human presence remain unknown.

Society Beyond the Evidence

For that reason, political affairs, diplomacy and organised warfare cannot be described for Ireland around this date. There were no documented polities, borders, leaders or negotiations, and archaeological evidence does not reveal conflict between human groups. Predation was real in the animal world, and survival in a cold environment would have been demanding, but it would be misleading to convert this into a human political history.

Equally, there is no Irish evidence for religion, formal learning, language, ceremonial practice or artistic traditions at 31,618 BCE. Upper Palaeolithic people elsewhere in Europe made sophisticated tools, ornaments and images, but those continental achievements cannot simply be transferred across the Irish Sea. They provide context for what was possible among contemporary *Homo sapiens*, not proof of what happened in Ireland. The same restraint applies to clothing, shelters and food: mobile hunter-gatherers would have needed practical knowledge of animals, weather, stone and seasonal landscapes, yet no Irish camp of this age allows its everyday routines to be reconstructed.

Economy, Movement and Loss

If people did reach Ireland, their economy was not farming, herding, metalworking or trade in the later historical sense. The plausible activity indicated by the Castlepook specimen is the immediate use of animal resources: meat, fat, hide, sinew, bone and antler were valuable materials to Upper Palaeolithic hunter-gatherers elsewhere. But there is no evidence in Ireland at this horizon for managed herds, cultivated crops, exchange networks, boats, imported materials or a settled population. Mobility, rather than permanent settlement, is the only interpretation compatible with the slender trace, and even that remains an inference rather than a demonstrated route or pattern.

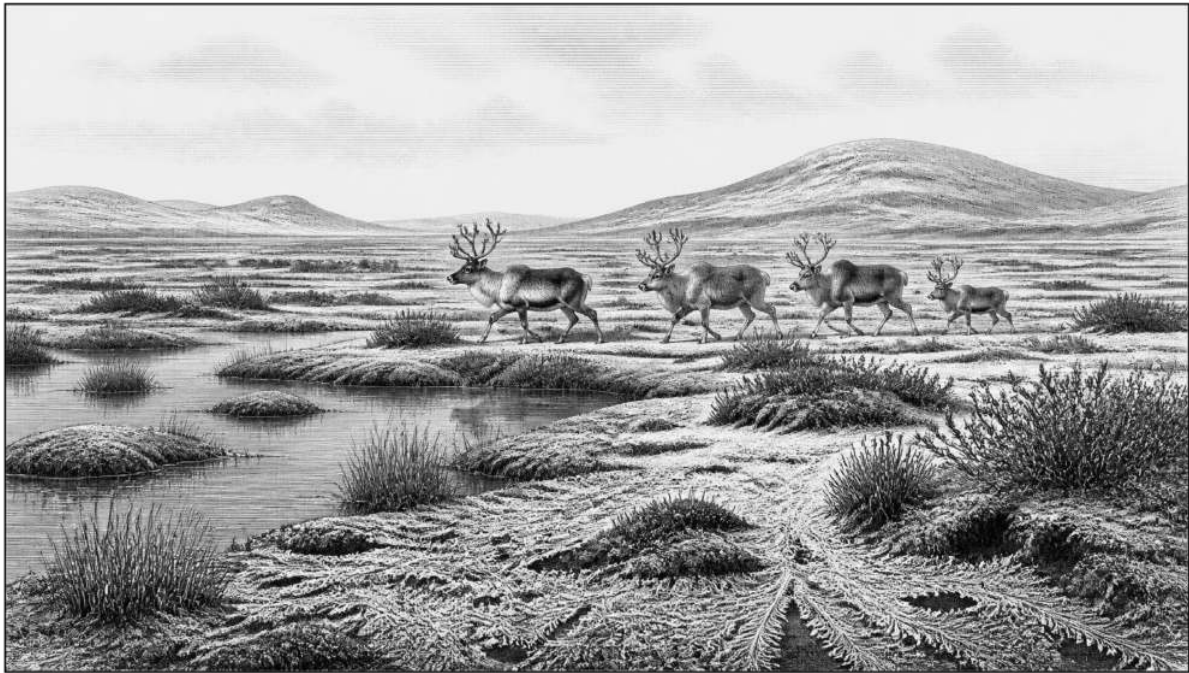
The overriding historical development was environmental instability. Landscapes capable of supporting wet tundra plants and roaming mammals were vulnerable to the growing power of ice. In subsequent millennia the British–Irish Ice Sheet expanded dramatically, covering much of Ireland and eroding, transporting or sealing earlier deposits. That process helps explain why evidence is so rare: the archaeological record was not merely never created; much of it was probably destroyed, displaced or concealed by glaciation and later rising seas.

Ireland around 31,618 BCE is therefore known not through kings, monuments or communities, but through a buried Fermanagh wetland and the bones of Cork caves. Derryvree's alpine clubmoss preserves the signature of cold freshwater tundra. Castlepook preserves the remains of animals that moved through a changing western edge of Europe, and perhaps one trace of people among them. Together they offer a rigorous, if fragmentary, beginning: not an annual chronicle, but a landscape in which Irish prehistory was briefly possible before ice transformed it again.

Chapter 084 of 100

31617 BCE

Birm-166 at Derryvree^[84]



The label “31,617 BCE” is a modern chronological convenience, not a year that anybody in prehistoric Ireland could have named or recorded. No written calendar, ruler-list, settlement sequence or archaeological layer can be assigned to that single year. The responsible history of this point in time is therefore a history of ranges, deposits and probabilities. It falls broadly within the later part of Marine Isotope Stage 3 (MIS 3), a highly variable phase of the last Ice Age, and just before the major expansion of the last British–Irish Ice Sheet. Ireland was not yet the familiar wooded island of later prehistory. Its landscapes were changing sharply between cold, open environments, local freshwater habitats and advancing ice.

A Date Range, Not a Dated Event

At this depth of time, radiocarbon dates require particular care. A radiocarbon measurement records the remaining carbon-14 in once-living material, not a calendar date; it must then be calibrated against independently constructed records of past atmospheric carbon. The modern IntCal20 calibration curve extends to 55,000 calendar years before present, but calibrated results at this age remain ranges, sometimes with more than one possible interval. “Before present” conventionally means before AD 1950. Thus 31,617 BCE lies approximately 33,567 calendar years before present, but that conversion should not imply accuracy to a year.

The most useful Irish evidence close to this horizon comes from Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater silts and fine sands exposed during roadworks in 1969 lay between two thick sheets of glacial till within a drumlin. The organic deposit produced a conventional radiocarbon determination of 30,500 radiocarbon years before present, with a substantial error range.

Later calibration has placed the wider Derryvree interval at roughly 36,900–31,700 calibrated years before present. The named year therefore belongs within the broad chronological world illuminated by the deposit, but Derryvree cannot tell us what happened there in that particular year.

Freshwater Between the Ice Advances

The arrangement of the Derryvree deposits is itself the central historical evidence. Till is sediment deposited directly by glacier ice. Beneath the freshwater bed lies one glacial deposit; above it lies another. Between those episodes, the locality supported standing or slow-moving freshwater and accumulated organic silt. This proves an interval in which ice did not cover that ground. It does not prove that the entire island was ice-free, nor does it map the exact edge of every glacier. Yet it decisively rules out a simple picture of Ireland as an unchanging, wholly frozen land throughout the period.

Plant macrofossils, pollen and small animal remains from Derryvree point towards an open, cold and largely treeless periglacial landscape. Pollen preservation was poor, and conclusions must remain proportionate to that limitation. Nevertheless, the plant evidence included herbaceous taxa associated with tundra, while mosses and wetland plants indicate waterlogged ground. Researchers have described a setting comparable in some respects to muskeg: sedge- and moss-rich wet ground, shallow pools and frost-affected soils. In a short growing season, low vegetation would have dominated exposed slopes and river margins. There is no sound evidence here for the oak, hazel and dense mixed woodland usually imagined as “Irish countryside”.

An Unstable Ice-Age Climate

Derryvree was not an isolated curiosity. Other Irish deposits beneath later glacial sediments, including records near Belcoo and Maguiresbridge, indicate that non-glacial environments survived during portions of the Midlandian glaciation. In south-west Ireland, uranium-thorium dating of broken cave calcite at Crag Cave has shown that speleothems formed episodically during MIS 3. Because calcite needs liquid water to grow, these episodes provide independent evidence that milder intervals interrupted the harsher conditions of the last glacial cycle.

That does not mean warmth in any modern sense. The Irish landmass stood on the Atlantic edge of north-west Europe, subject to abrupt climatic oscillations reflected in Greenland ice cores and North Atlantic records. Freezing conditions, snow cover, seasonal thaw, strong winds and ground frost would have structured life. Ice sheets did not necessarily grow as a uniform wall from all directions: their margins advanced, changed flow and sometimes paused or retreated. The best recent reconstructions place the principal growth of the last British–Irish Ice Sheet between about 31,000 and 26,000 years before present, with maximum extent reached later. Around this horizon, environmental transformation mattered more than any recoverable human political event.

Caves and the Animal World

The richest evidence for animals in southern Ireland comes from limestone caves, especially Castlepook Cave near Doneraile in north County Cork. Excavated in the early twentieth century and revisited by recent research, the cave has yielded a striking Pleistocene fauna. Re-dating has shown that some Castlepook material is considerably older than earlier laboratory results suggested. The wider Irish

Quaternary Fauna Project concluded that a varied mammalian fauna reached Ireland between at least about 45,000 and 20,000 years ago, though cave deposits frequently have disturbed histories and individual bones cannot always be treated as a single contemporaneous assemblage.

Reindeer are especially relevant to the landscape around 31,617 BCE. Their presence is consistent with open, cold country where lichens, sedges, grasses and dwarf shrubs could sustain seasonal movements. Castlepook also preserves evidence for animals now absent from Ireland, including spotted hyaena and woolly mammoth, alongside bears and smaller mammals. Such finds demonstrate that Ireland was periodically connected ecologically to wider north-western European faunal networks. They do not demonstrate that every listed species met at the cave, shared one habitat, or survived to the exact year under discussion. Cave bone collections record death, scavenging, denning, water movement and excavation history as well as living communities.

The Castlepook Human Question

This period has exceptional importance because a reindeer femur from Castlepook has been interpreted as carrying a deep cut made by a sharp stone edge during butchery. County Cork heritage material dates the object broadly to about 31,000 BC, and its identification has opened the possibility that Upper Palaeolithic hunters reached Ireland far earlier than the previously accepted evidence of human activity. The implication is considerable: people may have followed or encountered reindeer herds on the western edge of Ice-Age Europe.

But the distinction between evidence and interpretation is essential. The bone is direct evidence that a reindeer existed; the surface mark is the subject of a specialist interpretation as a tool cut. No stone tool has been securely linked to the femur, no camp floor of equivalent age has been excavated in Ireland, and the cave was not found in an intact modern excavation context. Furthermore, the cave may have been a carnivore den or a place where scavengers accumulated parts of carcasses, rather than a hunting station. The most cautious conclusion is not that Ireland possessed a permanent population, village or territory at this date. It is that a human visit or short-lived presence in southern Ireland is plausible and potentially signalled by the Castlepook bone.

Life Without a Recorded Society

If people did enter Ireland during this wider period, their lives would have been mobile and practical. Comparable Upper Palaeolithic groups elsewhere in north-west Europe used stone-edged tools, managed fire, made clothing and equipment from animal materials, and moved through seasonal landscapes in small social groups. Those comparisons can suggest what visitors to Ireland may have needed: warmth, shelter, fresh water, reliable routes and access to large game. They cannot supply Irish proof for clothing styles, language, kinship, ritual practice, artistic traditions or the number of people present.

There is no evidence for farming, livestock, fields, pottery, metalworking, permanent houses, exchange institutions or long-distance Irish trade at this date. Nor can archaeologists identify political affairs, warfare, diplomacy, chiefs, tribes or borders. The term “Ireland” is geographical here, referring to the landmass that later became the island, not to a state or people. Lower global sea levels changed coastlines and shelf environments, but this should not be turned automatically into a claim of a walkable land bridge. The channels, ice margins, changing sea levels and practical routes available to animals or people varied through time.

What This Moment Means

The enduring development around 31,617 BCE was the creation of a harsh but not lifeless Irish environment during an unstable Ice-Age interval. Derryvree's freshwater sediments preserve the strongest local picture: tundra-like wetland thriving between separate glacial advances. Castlepook's fauna shows that large mammals repeatedly reached southern Ireland, and its marked reindeer femur raises the serious, still limited possibility of a human encounter with that world. The record is fragmentary, but it is not empty. Its lesson is one of caution: deep Irish history begins here not with kings or monuments, but with silts beneath a drumlin, bones in a cave and the advancing shadow of ice.

Chapter 085 of 100

31616 BCE

Stone Mark in the Awbeg^[85]



The label 31,616 BCE is a modern chronological convenience, not a date that can be matched to an Irish event, ruler, settlement or season. No calendar, written record or archaeological sequence can resolve life in Ireland to this individual year. Expressed in the conventions used by Quaternary scientists, it lies approximately 33,566 years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a long and climatically unstable part of the last Ice Age. At this depth of time, radiocarbon results require calibration and are properly presented as ranges or broad phases. The evidence can illuminate an Ireland of cold environments, mobile animals and changing access to surrounding lands; it cannot provide a year-by-year national narrative.

A Landscape Before the Maximum

This was not yet the Last Glacial Maximum, the point at which the British–Irish Ice Sheet reached its greatest late-Pleistocene extent, broadly between about 27,000 and 23,000 years ago in different sectors. Ice was nevertheless an increasingly decisive force in the region. Later glaciers scraped away, buried or reworked much of the older Irish land surface. Their legacy is visible in tills, drumlins, scoured rock, meltwater channels and offshore landforms, but these features cannot identify conditions in a particular valley in 31,616 BCE.

The most responsible picture is therefore regional and provisional. Ireland was part of north-west Europe's glacial-world margin: a place whose climates changed sharply over millennia and sometimes more rapidly. Greenland ice cores demonstrate repeated abrupt switches between colder stadials and relatively milder interstadials across the last glacial period. Such records are essential for understanding

the North Atlantic setting, but they are not an Irish thermometer. Local topography, snowfall, wind, water and proximity to ice meant that conditions differed across the island. There is no basis for imagining Ireland either as a uniformly frozen wasteland or as a stable, welcoming plain.

Sea level was much lower than today because vast volumes of water were stored in continental ice sheets. The coastline consequently lay far beyond many modern shores, and portions of the Irish Sea basin were exposed at lower stands. Yet low sea level does not by itself establish an easy, continuous land route between Ireland, Britain and continental Europe at this particular date. The detailed timing, elevation and interruption of possible connections remain subjects for palaeogeographical reconstruction. Animals certainly reached Ireland during parts of MIS 3. How each population crossed, and whether people could have followed the same routes, remains less certain.

The Derryvree Wetland Window

A rare Irish environmental archive comes from Derryvree near Maguiresbridge in County Fermanagh. There, organic freshwater sediments survived between glacial deposits. Their plants, mosses, insects and sedimentary character have been interpreted as evidence for a cold, treeless, waterlogged landscape resembling muskeg: a mosaic of sedges, mosses, shallow water and frost-affected ground rather than woodland. Finds associated with the deposit include species adapted to open northern conditions, while plant evidence includes forms such as dwarf willow and mountain avens.

The Derryvree series has a conventional radiocarbon determination of about 30,500 radiocarbon years before present, with a substantial uncertainty. Calibration and the complexities of the deposit mean it cannot be treated as a photograph taken in 31,616 BCE. It does, however, provide a valuable nearby window on the sorts of periglacial wetlands that existed during the wider Middle Midlandian, or MIS 3, interval. It establishes environmental possibility: freshwater habitats and sparse tundra vegetation could occur in Ireland between phases of more extensive glaciation. It does not establish a settlement at Maguiresbridge, much less a continuous inhabited landscape.

For everyday animal life, this would have been a demanding but productive environment in season. Sedges, herbs, grasses, mosses and low shrubs could sustain grazing and browsing animals, while pools and wet ground attracted birds and smaller creatures. Winter cold, high winds and frozen soil would have constrained forage and movement. The rhythm of life was ecological rather than political: growth and dormancy, migration and scavenging, shelter and exposure.

Castlepook's Deep Archive

The chief Irish evidence for large mammals before the glacial maximum lies far to the south at Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, in the Awbeg Valley of north County Cork. This limestone maze cave is Ireland's richest known vertebrate archive for the period leading towards the Last Glacial Maximum. More than 2,000 bones have been recovered, and dates from individual specimens span a long interval, roughly 45,700 to 19,950 radiocarbon years before present. That span is itself a warning: the cave is an archive accumulated across many millennia, not a single contemporaneous scene.

Its fauna includes woolly mammoth, giant deer, reindeer, brown bear, wolf and spotted hyaena, with Arctic fox, lemmings and mountain hare represented in later cold-stage material. These animals should not be assembled into an imagined parade at the cave mouth in one year. Some remains belong to different climatic phases, and a cave can combine bones deposited by predators, scavengers, water,

gravity and people. Still, the assemblage decisively shows that Ireland was repeatedly connected ecologically to the wider north-west European world, and that open-country food webs could be sustained here before the peak of the last glaciation.

Spotted hyaena is especially important to interpretation. Hyaenas could carry carcass parts into dens, gnaw bones and leave accumulations that resemble human food debris at first glance. Wolves, bears and other processes further complicate the record. The cave's nineteenth- and early twentieth-century excavations also predate modern standards of stratigraphic recovery. Much original context was removed or disturbed. Recent fieldwork has sought surviving deposits, but the challenge is considerable: a scientifically valuable bone collection does not automatically preserve the relationships needed to reconstruct a hunt, a camp or a season.

The Reindeer Femur Question

A reindeer femur from Castlepook has given this period exceptional historical interest. County Cork heritage material identifies it broadly as c. 31,000 BC, and zooarchaeologist Ruth Carden has interpreted a deep incision on the bone as a mark made by a sharp stone tool during butchery. If that assessment is confirmed, it would indicate that one or more Upper Palaeolithic people processed reindeer in Ireland tens of millennia before the previously secure terminal-Pleistocene evidence for human activity.

That possibility must be stated with equal care. A radiocarbon determination dates the animal's death, not automatically the cutting action, the kill site or the length of any human visit. The femur derives from an older cave collection, not from an intact occupation floor associated with hearths, tools, food-preparation features or human remains. Stone-tool marks must also be distinguished microscopically from damage caused by carnivores, abrasion, breakage, excavation and later handling. No securely associated Palaeolithic stone-tool assemblage has yet been recovered from Ireland for this episode.

The femur is thus neither trivial nor conclusive. It is a potentially transformative object, and its importance lies precisely in the questions it raises. If it is humanly modified, it may record a short visit by hunters following herds or exploiting a carcass, rather than a settled community. It cannot demonstrate a permanent population, family group, territorial boundary or cultural continuity. The most secure later indication of Palaeolithic activity remains the cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare, directly dated to 12,810–12,590 calibrated years before present. That later evidence reinforces the value of rigorous dating and taphonomic analysis, rather than converting every marked Ice Age bone into proof of occupation.

Society Beyond the Evidence

There is no direct evidence from Ireland around this point for political affairs, diplomacy, warfare, named communities, burial rites, art, language, religious practice, trade networks or formal learning. Nor can archaeology responsibly infer them from the Castlepook femur alone. If people did reach Ireland, they would have belonged to Upper Palaeolithic worlds known elsewhere in Europe, where small mobile groups used stone technologies, shared knowledge through face-to-face networks and adapted closely to seasonal resources. But that is comparative context, not a description of a proven Irish society.

Likewise, there is no evidence for farming, livestock, permanent villages, cereal cultivation or an Irish economy in the later prehistoric sense. The only credible economic inference is ecological: reindeer and other large herbivores offered meat, fat, hide, sinew, bone and antler to any human groups capable of

reaching them. A single butchered element would suggest carcass processing, not a regular hunting territory or trade in animal products. The cave itself may have been a carnivore den or a natural bone trap rather than a human shelter.

What This Date Can Mean

For Ireland, 31,616 BCE is best understood not as an anniversary but as a point within a profound environmental transition. The island's landscapes were being shaped by climatic instability and by ice sheets that would later transform much of the terrain. Cold wetlands in Fermanagh and the rich, time-layered cave fauna of the Awbeg Valley reveal an Ireland capable, at intervals, of supporting tundra vegetation, reindeer, mammoth and formidable predators. They also reveal how fragmentary the record is.

The possible cut on the Castlepook reindeer femur gives human history a tantalising foothold in that world. It may prove that hunters briefly entered Ireland during MIS 3; it may yet require revision as research continues. Either way, the responsible story is not one of an established Ice Age nation, but of evidence patiently assembled from bone, silt, pollen, insects, cave passages, ice-sheet landforms and calibrated dates. Around this modernly numbered year, Ireland's most legible history is the history of an unsettled glacial landscape—and of the difficult work required to determine whether people ever crossed it.

Chapter 086 of 100

31615 BCE

Derryvree's Organic Silts^[86]



A modern calendar label such as 31,615 BCE gives a false impression of precision for Ice Age Ireland. No written calendar existed, and neither archaeology nor geological dating can identify an event in that individual year. The responsible frame is a broad, calibrated interval. This notional date falls within the later part of Marine Isotope Stage 3, a long, unstable phase of the last glacial cycle. The best directly relevant Irish evidence is not a settlement or a historical person, but a buried freshwater deposit exposed at Derryvree near Maguiresbridge, County Fermanagh.

Organic silts and fine sands at Derryvree lay between two thick sheets of glacial till within a drumlin. Their radiocarbon determination, 30,500 radiocarbon years before present, has been calibrated broadly to about 36,900–31,700 calendar years before present: approximately 34,950–29,750 BCE. The range, rather than any single point within it, is the meaningful result. It establishes that, sometime within that span, an ice-free or at least locally ice-free freshwater environment existed in north-central Ireland after an earlier glaciation and before a later advance. Around the date used here, Derryvree therefore provides a rare window onto a cold Irish landscape in motion.

A Landscape Between Ice Advances

The silts do not show a stable, temperate Ireland. They record an interval bounded by glacial action. Beneath them was older till, deposited by ice; above them was another till, evidence that ice later returned across the ground. Such a sequence is a reminder that the landscape was repeatedly reorganised by ice sheets, meltwater, frost and sediment. Many of the landforms now familiar in Ireland—drumlins, streamlined ridges, scoured rock and spreads of glacial debris—derive from these long episodes, though the surfaces visible today often reflect later phases rather than this particular interval.

The Derryvree deposit is conventionally associated with a cold phase and with open tundra-like conditions. Fossil plants, insects and other small remains point to wet ground with open pools, abundant plant material and mossy margins rather than woodland. This has sometimes been described as a muskeg environment: waterlogged, peaty or silty ground, interrupted by shallow water and exposed vegetation. It was a setting in which seasonality mattered intensely. Summers could permit plant growth and flowing water; winters were harsh enough for frozen ground and periglacial processes. The evidence supports a cold, largely treeless mosaic, not an unbroken white wilderness.

That distinction matters. “Ice Age” is not a uniform climate, and Ireland was not necessarily buried beneath ice everywhere at every moment before the Last Glacial Maximum. Millennial-scale shifts in North Atlantic climate produced alternations between colder stadials and relatively milder interstadials. Calcite growth in Crag Cave, County Kerry, has been dated across parts of this wider period. Because cave calcite requires liquid water moving through soil and rock, episodes of its formation provide independent evidence that conditions could ameliorate substantially, albeit temporarily. The Irish record is fragmentary, but it confirms that cold-stage environments changed repeatedly rather than simply worsening in a straight line.

The Reach of the Last Ice Sheet

At 31,615 BCE, the great expansion that culminated in the Last Glacial Maximum still lay ahead. The maximum extent of the British–Irish Ice Sheet is generally placed much later, roughly 26,500–19,000 years ago, although its growth and the timing of advances varied by region. Research on mountain trimlines, erratic boulders, offshore landforms and dated sediments suggests that a large part of Ireland was ice-free before about 34,000 years ago, followed by a prolonged build-up and expansion of the Irish Ice Sheet. This broad reconstruction makes Derryvree particularly valuable: its buried wetland belongs near the beginning of that transition, not at the point when the island was most extensively glaciated.

There are limits to that reconstruction. Individual ages have uncertainties, old samples can be contaminated or redeposited, and sediments may be reworked long after an organism died. Debate over deposits at Glenultra in County Mayo illustrates the problem. Marine shells and microfauna once seemed to support very old open-water conditions, but subsequent work has argued that some of this material may have been reworked and therefore supplies only a maximum age for the sediment containing it. This is not a weakness peculiar to Irish research; it is how Quaternary science proceeds. Competing explanations are tested against sedimentary context, new dating methods and the physical traces of former ice flow.

What can safely be said is that the island’s geography was very different from the modern Republic of Ireland and Northern Ireland. Sea level was globally lower than today because immense volumes of water were held in continental ice sheets, but lower sea level did not automatically create a simple, permanent walking route to Britain or mainland Europe. Ice margins, exposed shelves, rivers and marine channels altered through time. Any route into Ireland, whether for animals or people, must be considered in relation to this changing geography rather than imagined as a fixed land bridge.

Animals in an Open Country

Irish cave collections, especially from southern sites such as Castlepook Cave near Doneraile in County Cork, show that Ireland supported or received a striking Late Pleistocene fauna during parts of Marine Isotope Stage 3. The assemblages include reindeer, mammoth, giant deer, wolf, fox, arctic fox, bear and spotted hyaena, as well as lemmings. Their precise contemporaneity cannot always be assumed:

early excavations often removed deposits in ways that make it difficult to reconstruct every layer, and bones may have been moved by water or carnivores. Even so, improved dating of selected bones has shown that some southern Irish fauna is substantially older than previously thought.

These animals illuminate ecology rather than a complete food web for one year. Reindeer and lemmings are consistent with cold, open habitats. Mammoth and giant deer indicate that, at least during suitable intervals, the wider landscape could sustain large herbivores. Wolves and hyaenas show the presence of predators and scavengers. Caves were not neutral sample boxes: hyaenas and other carnivores could drag carcass parts inside, while bone gnawing, water movement and later digging mixed the evidence. A bone in a cave may therefore represent an animal killed nearby, carried there by a predator, or transported after death.

The Derryvree wetland and the cave faunas should not be fused into a single map of every animal living together. They come from different places and dating ranges. Taken cautiously, however, they suggest Ireland contained patches of usable habitat within a severe North Atlantic climate: wet basins, open ground, river corridors, sheltered limestone country and changing coastal or lowland routes. In such a world, animal populations may have expanded, contracted or disappeared locally as ice advanced and habitats shifted.

The Castlepook Human Question

There is no securely excavated camp, hearth, stone-tool assemblage, house, burial or artistic site that can be assigned to Ireland around 31,615 BCE. Political institutions, named communities, warfare, diplomacy, organised trade, farming and formal religious practice are consequently beyond the evidence. There is no basis for treating this date as the origin of a continuous Irish population, much less of later Irish languages, identities or traditions.

One find nonetheless makes this horizon unusually important. A reindeer femur from the old Castlepook Cave collection has been reported as carrying a mark interpreted as a cut made by a sharp stone tool, and the bone has been presented as dating to about 31,000 BCE. If the interpretation is sustained, it would indicate that one or more Upper Palaeolithic people processed reindeer in Ireland far earlier than the previously accepted evidence for human presence. It is an important possibility, not proof of a settled community. The bone derives from an antiquarian cave collection rather than a modern, sealed occupation surface, and no associated tool kit or hearth has been recovered.

The alternative explanations must remain visible. Carnivore damage, breakage, excavation history and surface alteration can complicate the reading of bone marks. Moreover, the date of an animal bone does not by itself date the moment of any incision, establish that hunters killed the animal, or show how long people stayed. A renewed excavation at Castlepook in 2022 demonstrated the continuing value of re-examining such sites, but also the difficulty of recovering intact Pleistocene deposits after earlier work. The appropriate description is possible early human activity, not established permanent occupation.

Society Beyond the Record

If people did reach Ireland in this period, they would have belonged to the wider Upper Palaeolithic human world of north-west Europe. Elsewhere, groups used sophisticated stone technologies, fire, hides, animal materials and extensive social connections. But none of those practices can be transferred

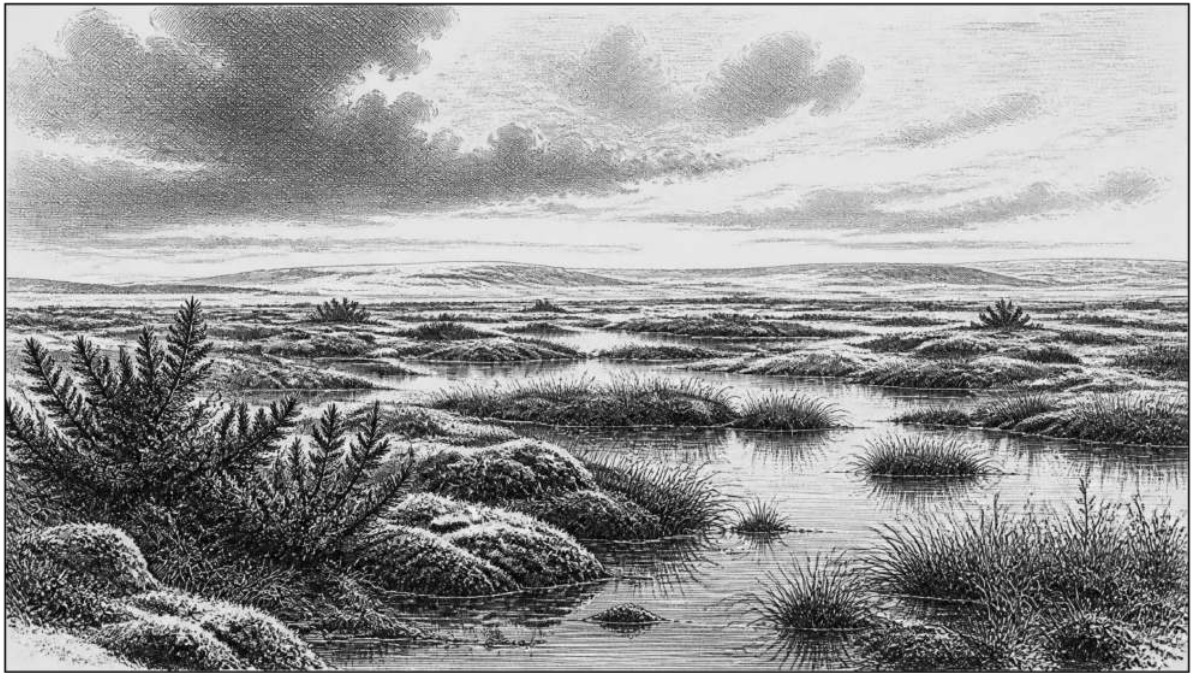
automatically across the Irish Sea. Ireland has yielded no demonstrable Gravettian or other contemporaneous tool tradition for this date. Nor can archaeology identify a language, a people's name, a religion or a political order from a single potentially modified bone.

The absence of evidence is itself historically significant. Ireland at this depth of time is better understood through palaeoenvironmental archives than through conventional history. Derrynvree's organic silts preserve the trace of a cold freshwater landscape between ice advances. Southern caves preserve a partial record of animals moving through, living in or being taken into Irish habitats. Together they reveal an island—or a changing north-western extension of the European margin—where climate and ice determined the possibilities of life. Whether people briefly entered that landscape remains a promising but unresolved question, and its answer must rest on new discoveries rather than on a falsely precise calendar year.

Chapter 087 of 100

31614 BCE

Derryvree's Treeless Fen^[87]



“31,614 BCE” is a modern way of pinning a deep prehistoric interval to a numbered calendar. Nobody in Ireland recorded such a year, and the evidence cannot distinguish one season, let alone one day, from the next. The responsible frame is therefore broader: this point falls in the Late Pleistocene, during Marine Isotope Stage 3, within the long, volatile last glacial cycle. The best Irish evidence is expressed in calibrated ranges and environmental phases, not annual events.

One especially useful range comes from Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater silts there returned a conventional radiocarbon age of $30,500 \pm 1,100$ radiocarbon years BP; calibration places the deposit broadly at about 36,900–31,700 calibrated years BP. Thus 31,614 BCE lies close to, but cannot be securely isolated within, the later end of the dated interval. The deposit illuminates an Ice-Age landscape that existed between episodes of glaciation, rather than furnishing a chronicle of a particular year.

A Fen Between Ice Advances

Derryvree was exposed in a road cutting through a drumlin, one of the streamlined hills fashioned by glacier ice. Its sequence is powerful because organic layers of freshwater silt and fine sand lay between two thick sheets of till, sediment deposited directly by ice. The lower till records an earlier glacial episode; above it, water accumulated and plants, insects and small organisms left their remains; the upper till shows that ice later returned across the site. It is a rare survival from a landscape that successive ice sheets repeatedly scraped away or buried.

The fossils identify neither a green Ireland nor a featureless white wilderness. Pollen, plant macrofossils, mosses and beetles point to cold, open, treeless ground with wet hollows and pools: a tundra-like muskeg, in the older Irish Quaternary terminology. Grasses and sedges were prominent,

accompanied by juniper and herbs. A bogbean seed, a small but telling fossil, indicates freshwater or wet ground capable of sustaining aquatic and marginal plants. Insects of northern, cold-climate aspect reinforce the conclusion. This was a patchwork of damp vegetated ground, mossy margins and open water, held within a periglacial climate of hard winters, short growing seasons, frost action and seasonal thaw.

That reconstruction is evidence-based, but it needs limits. The plants and insects came from one protected basin in Fermanagh, not from every valley and coast of the island at once. Pollen can travel and older material can be reworked. “Tundra” is consequently a useful ecological comparison, not a claim that every square mile resembled any single modern Arctic place. Nevertheless, Derryvree firmly demonstrates that at some point during its dated interval north-central Ireland was locally ice-free, watered and vegetated.

Ice Sheet in Formation

At this date Ireland had not yet reached the Last Glacial Maximum, the later phase—broadly around 26,000 to 21,000 years ago—when the British–Irish Ice Sheet covered all or almost all of the island’s low ground. Its ice history was neither simple nor synchronous. Glaciers expanded and contracted in response to abrupt North Atlantic climate shifts, while individual sectors advanced at different times. The Derryvree organic beds and related Fermanagh deposits place an important constraint on that history: extensive ice could not have occupied their sites while freshwater sediment was being laid down.

Some reconstructions infer that ice cover in Ireland was still limited before about 32,000 calibrated years ago, followed by build-up and expansion. Other evidence from the western seaboard, particularly dated marine microfauna and shells, indicates substantial ice loading during parts of the wider 40,000–19,000-calibrated-years-BP interval. These are not irreconcilable statements. They show why a single island-wide map for 31,614 BCE would imply precision the evidence does not possess: an ice margin could be advancing in one sector while an inland wetland or coastal marine environment survived elsewhere or at another point in the same millennia.

Sea level was much lower globally than it is now because enormous volumes of water were locked in northern ice sheets. Ireland was not the familiar island of modern maps. The Irish Sea basin and Atlantic shelves were altered landscapes of shallow sea, exposed ground and changing ice-fed waters. Yet lowered sea level did not automatically create an easy, permanent land route between Ireland and Britain. The reachability of Ireland by animals or people depended on shifting shorelines, channels, ice, weather and the availability of usable terrain, not merely on a line drawn between present coastlines.

Animals of the Open Country

Southern Irish caves provide a complementary, if complicated, record. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork has produced one of Ireland’s most important assemblages of Pleistocene vertebrates. Its identified cold-stage animals include woolly mammoth, reindeer, giant deer, spotted hyaena, wolf, foxes, brown bear, hare and lemmings. This is not a picture of an empty land. It is evidence for a food web capable, at favourable times, of sustaining large grazers and browsers, predators and scavengers.

But a cave bone assemblage is not a census. Many Castlepook remains were excavated in the early twentieth century, before present standards of stratigraphic recording, and bones from different deposits and ages may have become mixed. Carnivores carried and chewed some material; water and later

disturbance also altered contexts. Modern re-dating has shown that several earlier determinations from Castlepook, Foley and Shandon caves were too young, sometimes by thousands of radiocarbon years. The revised work indicates that particular mammals, including giant deer and spotted hyaena, were present in Ireland during MIS 3 and may have disappeared locally before the Last Glacial Maximum. It does not prove that every species in the collection lived together at Derrynvree's precise moment.

The animal evidence nevertheless gives scale to the Fermanagh wetland. Reindeer could exploit open, seasonal country; mammoths and giant deer imply access to extensive forage beyond a tiny pool margin; hyaenas and wolves point to carcasses, hunting opportunities and competition among carnivores. Ireland was part of a wider north-west European ecological zone, rather than an isolated biological enclave. Movements of animals would have been recurrent responses to climate, forage and passable routes, not evidence of organised migration controlled by a human authority.

People: A Possibility, Not a Polity

There is no securely excavated settlement, hearth, stone-tool workshop, burial, house floor or enduring camp from Ireland that can be assigned to 31,614 BCE. Accordingly there can be no responsible account of Irish government, diplomacy, tribes, named leaders, warfare, religious institutions, learning or trade networks in this year. Such subjects belong to historical societies with documentary or substantial archaeological records; they cannot be recovered from a handful of sediments and cave bones.

A reindeer femur from the Castlepook collection has, however, been reported as bearing marks consistent with cutting fresh tissue by a sharp stone tool and as dating to roughly 33,000 years ago in reporting on the find. If the marks and association are sustained by further specialist study, it would be exceptionally important evidence that one or more people processed a reindeer in Ireland during MIS 3. It would show an episode of animal use, perhaps by a very small and mobile party, not a settled population or a continuous occupation. The cave's complex excavation history and the broader problems of dating its fauna make caution essential. A bone's age is not automatically the date of a cut, and one modified specimen cannot supply a whole social world.

The absence of a settlement record is also not proof that nobody ever crossed into Ireland. Ice has eroded surfaces, rising seas have drowned former coasts, acidic soils damage bone, and hunter-gatherer visits may leave little behind. Yet historical method requires the opposite caution as well: absence cannot be converted into a story of Palaeolithic villages, seasonal hunting territories or cultural identity. The first substantial and unambiguous archaeological record of human lifeways in Ireland remains vastly later, among Mesolithic hunter-gatherers after the final retreat of the ice.

Daily Life Without a Household Record

If people did reach Ireland in this interval, the wider European Upper Palaeolithic provides only a comparative context, not direct Irish proof. Elsewhere, mobile groups used carefully made stone tools, worked hides and bone, shared food and knowledge, and adjusted movements to highly seasonal animal landscapes. Reindeer in particular could offer meat, fat, hides, sinew and bone. None of that permits us to state that a specific Irish group possessed a given tool tradition, language, ritual or artistic practice. No Irish artefact assemblage of this date demonstrates it.

Religion and culture are similarly beyond direct recovery. There are no known shrines, graves, images, ornaments or inscriptions from Ireland securely belonging to this interval. The Derrynvree flora shows resilience rather than belief; the Castlepook fauna shows an ecosystem rather than a mythology.

The most meaningful cultural lesson lies in the discipline of uncertainty: Ireland's deep past is not a blank page, but its surviving marks are fragmentary and must not be made to speak in invented voices.

A Landscape Before the Maximum

Around the modern label 31,614 BCE, then, Ireland should be envisaged as a changing cold-stage land on the threshold of much more extensive glaciation. In Fermanagh, a freshwater fen or wetland supported sedges, mosses, insects and other life amid open, treeless ground. Across longer MIS 3 timescales, caves in the south preserve traces of an unexpectedly varied mammal community. Ice, water, frost and shifting sea levels repeatedly reorganised habitats and later destroyed much of their evidence.

The chief development was environmental, not political: a habitable but severe periglacial mosaic existed during an unstable interval before the island was overwhelmed more fully by the later ice sheet. Derryvree's silts, rather than a king, battle or monument, are the closest thing Ireland has to a contemporary record. They preserve a small wet world between glaciers—and the reminder that even in the Ice Age, the island's landscape was dynamic, locally diverse and only imperfectly known.

Chapter 088 of 100

31613 BCE

Maguirebridge's Moss Basin^[88]



A label such as 31,613 BCE is useful for arranging a long chronology, but it cannot identify an event in Ireland that happened in a particular year. No calendar, writing, named community or dated human occupation survives from this depth of time. On simple modern arithmetic the label sits about 33,560 years before AD 1950; archaeology, however, works here with broad and revisable ranges rather than with single years. The best Irish evidence is the organic deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its calibrated radiocarbon range, about 31.7–36.9 thousand calendar years before present, encompasses this notional date. It offers a rare, local glimpse of an Ice Age landscape, not an annual chronicle.

A Cold-Phase Landscape

The period belongs to the later part of Marine Isotope Stage 3, an unstable interval within the last glacial cycle, known in Irish usage as part of the Midlandian cold stage. This was not the Last Glacial Maximum itself. The island would later be far more extensively overridden by the British–Irish Ice Sheet, but around the broad Derryvree interval there were ice-free parts of Ireland capable of supporting cold-adapted plants and animals. The important qualification is regional variation: the precise position, thickness and behaviour of ice changed through time, and evidence from one valley cannot furnish a weather report for the whole island.

At Derryvree, roadworks in 1969 exposed a drumlin section with freshwater silts and fine sands trapped between two substantial sheets of glacial till. The lower till records an earlier advance of ice; the upper one shows that ice later returned. Between them is a short-lived archive of conditions when the basin held water and accumulated sediment instead of being occupied by glacier ice. The deposit's conventional radiocarbon determination, Birm-166, was 30,500 radiocarbon years before present, with a

wide laboratory uncertainty. Calibration is essential because radiocarbon years and calendar years are not interchangeable. Modern calibration work therefore expresses the age as a range, not as an exact conversion to 31,613 BCE.

That stratigraphic position is the central historical fact. Ireland was neither a timeless white wilderness nor a stable, wooded country. It was a place repeatedly altered by glacial advance, meltwater, frost and sediment movement. The survival of the Derryvree silts is exceptionally fortunate: later ice reshaped much of Ireland and commonly removed, mixed or buried older surfaces. Consequently, the apparent scarcity of evidence should not be mistaken automatically for proof that cold-stage landscapes were empty of life.

Wet Ground Under Open Skies

The Derryvree samples contain pollen, plant remains and insects that point to treeless tundra and a periglacial regime. Grasses, sedges, juniper and herb pollen, alongside mosses and aquatic or wet-ground plants, indicate an open mosaic rather than forest. The term *muskeg*, used by the original investigators, conveys waterlogged, peat-forming ground with mossy surfaces and shallow pools. It should not conjure a modern Canadian scene transplanted unchanged to Fermanagh; it is a useful ecological comparison for saturated, cold terrain rich in plant matter.

Such a setting would have been seasonal and difficult. Frozen ground, snow cover and bitter winters constrained plant growth, while the short growing season made sheltered wet places disproportionately valuable. In summer, meltwater and local drainage could sustain sedges, mosses and low herbs; in other seasons the same ground could be frozen, snowbound or churned by frost. The evidence establishes broad habitat, not the precise temperature, rainfall or appearance of an individual year. Estimates of climate must remain interpretations derived from biological indicators, sedimentary context and comparison with other northern records.

Crag Cave in County Kerry adds a second, differently formed line of evidence. Its calcite formations grew only intermittently during Marine Isotope Stage 3, when liquid water could percolate through the cave system. Uranium-thorium dates link these episodes broadly to North Atlantic climatic oscillations recorded in Greenland ice. This does not mean that a specific Greenland interstadial can be assigned with certainty to every Irish deposit. It does demonstrate that Ireland's climate responded to abrupt, millennial-scale changes, and that warmer intervals within an overall glacial world could make a material difference to landscapes at the Atlantic edge.

Animals, Caves and Caution

Southern Irish caves preserve the other major body of evidence. Castlepook Cave, near Doneraile in north County Cork, has yielded remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, hare, lemmings and spotted hyaena. Together they show that parts of Ireland supported a richer cold-stage fauna than its later historical wildlife would suggest. Reindeer and lemmings are particularly compatible with open, cold habitats; hyaenas and mammoths underline Ireland's connection to the wider north-west European Pleistocene fauna.

Yet Castlepook is not a neatly sealed village deposit, nor are all its bones contemporary. Much material was recovered in early twentieth-century excavations, when recording methods did not meet present standards. Caves accumulate remains through scavenging, carnivore denning, natural deaths, sediment movement and excavation disturbance. Recent redating has shown that several older

radiocarbon results from southern Irish caves were unreliable and that some Castlepook animals were substantially older than previously thought. The assemblage is therefore powerful evidence for recurring animal presence during Marine Isotope Stage 3, but it cannot establish that every listed species stood together in Cork in the notional year 31,613 BCE.

A reindeer femur from Castlepook has been reported as bearing a deep mark interpreted as a stone-tool cut made during carcass processing. If that interpretation is confirmed, it would be an extraordinarily early indication of people in Ireland. It is not, however, a licence to populate the country with a settled hunting society. The bone has no accompanying stone-tool assemblage, hearth, dwelling, human remains or securely excavated occupation floor. Nor does a date for the animal's bone necessarily date the alleged cut precisely. Natural damage and carnivore action can complicate surface-mark analysis. The responsible conclusion is that the femur raises a serious and important possibility of human activity, while the evidence remains too slight to describe a confirmed population at this date.

No Politics, No Proven Trade

There is no basis for political history in Ireland at this horizon. Archaeology supplies no chiefs, territories, assemblies, alliances, conflicts between human groups or diplomacy. Equally, there is no Irish evidence for religion, burial rite, art, language, formal learning or social rank. The silence is not an invitation to fill the landscape with imagined clans and rituals. It reflects both the fragility of evidence from mobile hunter-gatherers and the destruction wrought by later glaciation.

Economy and trade must be framed just as cautiously. If people entered Ireland, they may have practised short-term, highly mobile hunting and carcass processing, as groups elsewhere in glacial north-west Europe did. Reindeer would have offered meat, hide, sinew, bone and antler; other large mammals were potential resources. But these are general possibilities, not demonstrated Irish activities. No contemporary worked flint, weapon point, butchered assemblage in secure context, imported material or exchange route has been recovered for this specific interval. It is safer to describe a potentially usable animal landscape than an Irish hunting economy.

Nor should the sea be treated as a settled fact. Lower global sea levels exposed broad shelves around north-west Europe, and later modelling indicates land connections between Ireland and Britain during portions of the last glacial period. The exact routes, dates and practical passability of crossings depended on sea level, ice extent, terrain and seasonal conditions. Whether animals and any people reached the island over exposed ground, ice, narrow water gaps or a changing combination of these remains an open geographical question. Evidence of fauna proves arrival, but does not reveal the route.

Regional Change Before the Ice Maximum

The most important development around this notional year was environmental rather than political: an ice-free, periglacial interval was preserved within a landscape bookended by glaciation. Derryvree shows that freshwater pools, mossy wet ground and tundra plants occupied part of Fermanagh. Castlepook and other cave sites show that cold-adapted mammals repeatedly reached Ireland during the broader period. Crag Cave suggests that climatic ameliorations could register even in the island's karst systems. Together these records replace an outdated picture of a uniformly lifeless Ireland before the final great ice expansion.

They do not make Ireland continuously habitable or continuously inhabited. Subsequent growth of the British–Irish Ice Sheet transformed the island again, at its greatest extent covering most of it and eroding many older landscapes. What can responsibly be said for 31,613 BCE is therefore modest but significant: Ireland lay within a dynamic North Atlantic Ice Age world; at least some ground was open and wet rather than buried beneath ice; tundra biota occupied it; and rare deposits now allow that vanished environment to be studied. The human story, if there was one, remains a question being tested rather than a chapter securely written.

Chapter 089 of 100

31612 BCE

Derryvree's Inter-Till Fen^[89]



“31,612 BCE” is a modern filing label, not a date that can be recovered from the Irish archaeological record. Nobody in Ireland counted years in this manner, no written testimony exists, and neither radiocarbon dating nor glacial deposits can distinguish one calendar year from the next at such depth in time. The label corresponds roughly to 33,561 years before AD 1950, the conventional radiocarbon ‘present’. It belongs to the later part of Marine Isotope Stage 3 (MIS 3), a fluctuating cold phase of the Late Pleistocene. The most responsible account of Ireland at this point is therefore not an annal of events, rulers or settlements, but a reconstruction based on sediments, fossils, landforms and carefully qualified dates.

A Broad Chronological Window

The best Irish evidence close to this nominal year comes from Derryvree, near Maguiresbridge in County Fermanagh. Road excavations in 1969 cut through a drumlin and exposed a striking sequence: freshwater silts and fine sands containing organic material lay between two separate thick layers of till, the unsorted debris deposited by glacier ice. The order of the layers provides the central fact. An earlier ice advance laid down the lower till; a period without local ice permitted water, sediment, plants and small animals to accumulate; a later advance buried the deposit beneath the upper till. The Derryvree evidence does not tell us what happened in 31,612 BCE itself. It does demonstrate that north-central Ireland had an ice-free interval during this wider cold-stage sequence.

Organic material from the freshwater beds produced a conventional radiocarbon age of 30,500 years BP, with a substantial uncertainty of +1,170 and –1,030 years. Published calibrations place the deposit broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE when expressed in BCE terms. The nominal year falls within that wide span, but cannot be located more precisely inside

it. Calibration is essential because radiocarbon years are not direct calendar years: atmospheric carbon-14 concentrations have altered through time. At around 34,000 calendar years ago, even the most sophisticated calibration curves provide ranges rather than a historical stopwatch. Derryvree should thus be read as evidence for an environmental interval, not for a dated episode.

Wet Ground Beneath the Drumlin

The plants, insects and sediments at Derryvree describe a cold, open landscape rather than the wooded Ireland familiar today. The original investigators identified a flora and fauna of full-glacial character and interpreted the setting as treeless tundra under a periglacial climate: ground shaped by repeated freezing and thawing at the margins of ice. Later syntheses have likened the local habitat to muskeg, a waterlogged mosaic of mossy ground, sedges, shallow pools and plant-rich margins. Such a landscape was neither a uniform frozen desert nor a modern bog transplanted into the past. It was a wet, exposed environment in which water could persist seasonally or locally even while winters were severe and frost was a powerful agent of change.

This modest Fermanagh deposit matters because it preserves a living surface later concealed by ice. Fine sediments retained pollen, plant macrofossils and insect remains that are normally lost when glaciers erode and redeposit older ground. The evidence supports the presence of open vegetation and freshwater habitats around Derryvree; it does not licence a map showing all of Ireland as the same kind of tundra at one moment. Conditions varied with altitude, drainage, latitude, proximity to ice and the changing North Atlantic climate. The record at nearby Greenagho, also beneath till in Fermanagh, is older, while cave deposits in the south have their own complex histories. Ireland was a changing patchwork, not a single climatic zone.

Ice Was Building, Not Yet at Its Greatest Extent

This was an age of instability rather than the final peak of the last glaciation. The great British–Irish Ice Sheet had not yet reached its maximum volume, which current large-scale reconstructions place much later, around 23,000 years BP, with different sectors advancing and retreating at different times. Ice expansion around Ireland was asynchronous. Some areas could retain or receive ice while others remained exposed; a local ice-free deposit does not prove that the whole island was ice-free. Nevertheless, Derryvree and other pre-Last Glacial Maximum records are important checks against an older, over-simple image of Ireland as continuously buried beneath one unchanging ice cap.

Climate shifts across MIS 3 could be abrupt on geological timescales. Greenland ice cores reveal repeated interstadials and stadials, episodes of relative warming and cooling whose North Atlantic effects reached the western edge of Europe. In south-west Ireland, the interrupted growth of calcite deposits in Crag Cave offers an independent indication that conditions alternated between periods when liquid water could circulate through shallow cave systems and periods too cold for such growth. Correlating a particular Irish sediment directly with a named Greenland event remains cautious work, especially where dates are broad. The important conclusion is not a precise weather report, but the sensitivity of Irish land, ice and drainage to repeated climatic shifts.

Animals and a Connected Landmass

Southern cave collections show that Ireland was inhabited at various times during MIS 3 by a far richer mammal community than survives today. Castlepook Cave, or Mammoth Cave, near Doneraile in north County Cork is the island's most important repository of fauna from the period leading towards the Last Glacial Maximum. Its assemblage includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, with later cold-stage records also including Arctic fox, wolf and lemmings. These animals should not all be placed together at Derrynree in the nominal year. Cave deposits can combine material accumulated over long periods, and renewed dating has shown that several older determinations from Castlepook require reassessment. Fossils establish presence somewhere in Ireland within dated intervals, not a single contemporary herd or hunting scene.

Even so, the animals reveal important ecological connections. Lower sea levels and changing ice configurations sometimes made movement between Ireland, Britain and continental Europe possible, whether across exposed terrain, coastal corridors or short-lived land connections. The exact geography and duration of such connections remain debated because relative sea level, isostatic crustal movement and ice margins all changed. It is safer to say that Ireland was not inevitably isolated throughout MIS 3. Mammoth, hyaena and reindeer remains show that terrestrial mammals did reach the island during the wider period. Their arrival required accessible routes and suitable habitat, while their later disappearance reflects both environmental change and the severe disruptions associated with advancing ice.

No Demonstrable Community

There is no securely published settlement, hearth, stone-tool assemblage, grave, house or worked object that permits a description of Irish human society in or specifically near 31,612 BCE. Nor is there evidence for political authority, diplomacy, warfare, trade networks, ritual practice, language, art or formal learning on the island at this date. It would be misleading to populate the Derrynree wetland with a named hunter-gatherer band merely because humans were present elsewhere in Upper Palaeolithic Europe. Human dispersal on neighbouring landmasses makes occasional visits to Ireland conceivable, particularly during phases of low sea level and faunal movement; it does not turn possibility into evidence.

A reported reindeer femur from Castlepook has attracted attention because surface marks have been interpreted as possible traces of stone-tool butchery and the bone has been associated in public discussion with an age of about 33,000 years. That claim has not supplied a published, securely contextualised archaeological occupation comparable to recognised Palaeolithic sites elsewhere in Europe. It should therefore remain separate from the environmental evidence. The appropriate conclusion for this date is that Ireland contained habitable, though demanding, landscapes for cold-adapted animals and perhaps transient human movement, but no known resident population. The earliest firmly documented human activity in Ireland belongs much later, after the main ice-sheet phase.

The History Is Environmental

For this remote point in Irish history, the great development was environmental change. Water gathered in a hollow near present-day Maguiresbridge; sedges, mosses and other tundra plants occupied its margins; insects lived in and around the wet ground; later glacier ice sealed the evidence beneath a

drumlin. Far to the south, cave chambers accumulated bones whose study continues to revise the chronology of Ireland's Ice Age fauna. These are not minor substitutes for lost chronicles. They are the primary record. Derryvree gives Ireland at 31,612 BCE a discernible setting: open, cold, wet, locally ice-free terrain within a wider world of shifting climate, mobile animals and approaching ice. What it cannot give is a year-by-year narrative, and recognising that limit is part of telling the period faithfully.

Chapter 090 of 100

31611 BCE

The Derryvree Freshwater Series^[90]



“31,611 BCE” is a modern chronological label, not a year that can be recovered from Irish evidence. No calendar, written record, named leader or dated event existed in Ireland at this depth of time. In archaeological terms, the label falls roughly 33,560 calendar years before present, with “present” conventionally fixed at AD 1950. Such conversions are necessarily approximate. Radiocarbon results must be calibrated, their uncertainties can extend across centuries or millennia, and an age for bone or sediment does not identify a particular season, community or historical incident.

The responsible subject is therefore Ireland *around* this point: a Late Pleistocene landscape within Marine Isotope Stage 3, long before the Last Glacial Maximum. The best evidence is environmental rather than political. Freshwater silts, pollen, plant macrofossils, insect remains, cave bones and the arrangement of glacial deposits offer fragments of a changing country. They illuminate ice-free ground in some areas, cold-adapted life and the possibility of fleeting human activity, but they do not support a narrative of settlements, tribes or rulers.

A Date Within a Range

The closest well-studied Irish archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road excavations in 1969 cut through a drumlin and exposed fine sands and organic freshwater silts trapped between two separate sheets of till, the unsorted sediment left by glacier ice. This sequence matters more than any single numerical date. Ice had affected the locality before the freshwater deposit accumulated; later ice covered and preserved it. Derryvree consequently demonstrates a substantial interruption in glacial conditions, not an unbroken frozen landscape across all Ireland.

Organic material from the deposit returned a conventional radiocarbon age of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. In calibrated form, scholarship has placed its probable age broadly within the later part of MIS 3; one commonly used calibrated range is about 36,900–31,700 calendar years BP. The modern year-label 31,611 BCE lies broadly within that kind of chronological horizon, but it cannot be assigned to a layer within the deposit. Derryvree is an archive of an interval, not a diary for a single year.

Comparable deposits elsewhere in Fermanagh reinforce the larger conclusion while showing why precision is difficult. Freshwater organic sediments at Hollymount and Greenagho were also preserved beneath later till. Their dates and stratigraphic histories are not equally secure, and some legacy determinations are treated cautiously, yet together they show that parts of northern Ireland experienced cold, non-glacial episodes before the later expansion of the British–Irish Ice Sheet. They do not prove that every Irish valley, coast or upland had the same conditions at the same time.

Wet Tundra, Not Empty Ice

Derryvree's biological remains give the clearest picture of everyday surroundings. The deposit contained freshwater mosses and sedges, herb pollen, insect remains and macrofossils associated with open tundra vegetation. Bogbean, dwarf willow, mountain avens, lesser clubmoss and water-milfoil are among the recorded indicators. Their presence does not mean that a neat modern plant community stood unchanged at the site. Rather, each is evidence that particular wet, exposed or shallow-water habitats could exist within a harsh periglacial environment.

The resulting landscape was probably a mosaic. Low ground could hold mossy, sedge-rich marsh, pools and slow water; better-drained patches supported herbs and sparse low shrubs; frost action repeatedly disturbed soils. Trees were absent locally or extremely scarce. Poorly preserved grains of pine and hazel pollen are not good evidence for a forest: they may have travelled far or entered sediments secondarily. The stronger signal is of open country, with a short growing season and severe winters.

“Periglacial” is important here. It describes ground shaped by intense freezing and thawing near ice, not necessarily ground permanently buried beneath a glacier. Water could flow and freshwater vegetation could grow during favourable seasons, while winter frost and low temperatures placed firm limits on soils and plant cover. This was not modern Fermanagh with its fields, woods and lough margins, though it was not a featureless polar desert either. Derryvree preserves a cold wetland in a landscape capable of supporting specialised plants, insects and, where routes and forage allowed, grazing animals.

Animals in a Mobile Landscape

Cave deposits in southern Ireland show that a varied cold-stage fauna reached the island during MIS 3. Castlepook Cave near Doneraile, County Cork, has produced remains attributed to reindeer, brown bear, Arctic hare, fox, spotted hyaena, mammoth and other animals. Dates have been repeatedly reassessed as radiocarbon methods and chemical pretreatment improved. The central conclusion is not that every species occupied every district simultaneously, but that Ireland was connected to wider north-west European ecological networks during portions of the Late Pleistocene. Sea levels were far lower than today, coastlines lay far beyond their present positions, and the Irish Sea region presented a very different geographical threshold.

Reindeer are especially useful for imagining the practical ecology of open ground. Herds could exploit tundra and steppe-like vegetation, moving seasonally through landscapes that also attracted predators and scavengers. Spotted hyaena bones and cave accumulations warn against assigning every

animal remain to people: caves were used or entered by carnivores, and bones may have been moved, gnawed, redeposited or exposed long after death. A mammoth or reindeer bone tells us that an animal reached Ireland; it does not by itself prove a hunting ground, a human camp or a permanent population.

At 31,611 BCE, then, the most defensible account of economy is an ecological one. There is no evidence for farming, domesticated animals, fields, stores, houses, craft production or organised trade in Ireland. Wild animals and plant resources formed the available subsistence base. If people were present, they would have depended on portable technologies, intimate environmental knowledge and short-term access to game, fuel, water and shelter. These are reasonable inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not demonstrated facts about a documented Irish community.

The Human Question at Castlepook

The possibility of people in Ireland during this broad period has made Castlepook exceptionally important. A reindeer femur from the cave, held in the National Museum of Ireland collections, has been described as bearing a mark made by a sharp stone edge on fresh bone. Public interpretation of the specimen has associated it with a date of about 33,000 years ago. If microscopic and taphonomic study ultimately confirms that the mark is an anthropogenic cut, it would indicate that a person or small group processed animal tissue in Ireland far earlier than the island's formerly accepted archaeological record.

That proposition must remain carefully bounded. The object came from older cave investigations, not from a newly excavated occupation surface containing a secure tool assemblage, hearth, shelter floor and repeated butchery debris. A cut mark, however suggestive, cannot establish whether people hunted the animal, scavenged it, stayed overnight or returned repeatedly. Nor can it identify language, ancestry, social organisation, ritual or a named Upper Palaeolithic culture. The proper description is possible human activity, not established settlement.

There is no responsible evidence for political affairs, diplomacy or warfare in Ireland at this date. Equally, there is no evidence for formal religion, monuments, burials, visual art or institutions of learning. People, if present, certainly possessed knowledge and social practices, but archaeology has not recovered Irish material that permits their content to be described. Silence in the record is not proof of cultural absence; it is a limit imposed by preservation, later glacial erosion and the very small number of securely investigated deposits.

Ice Yet to Come

The wider climatic setting was unstable. Ireland lay on the Atlantic fringe, where shifts in sea ice, ocean circulation and atmospheric circulation could alter temperature and moisture rapidly on geological timescales. U-series dates from Crag Cave in County Kerry show that speleothem growth during the last glacial occurred episodically during milder Greenland Interstadials. Because cave calcite requires liquid water moving through the ground, those growth episodes independently show that south-west Ireland periodically crossed the freezing threshold. They should not, however, be used to reconstruct a specific Fermanagh weather pattern for 31,611 BCE.

Later, during the Last Glacial Maximum, the British–Irish Ice Sheet expanded much more extensively, covering Ireland and reshaping or removing many earlier landscapes. Modern reconstructions place the global maximum broadly between 26,500 and 19,000 years ago, while the timing, thickness and

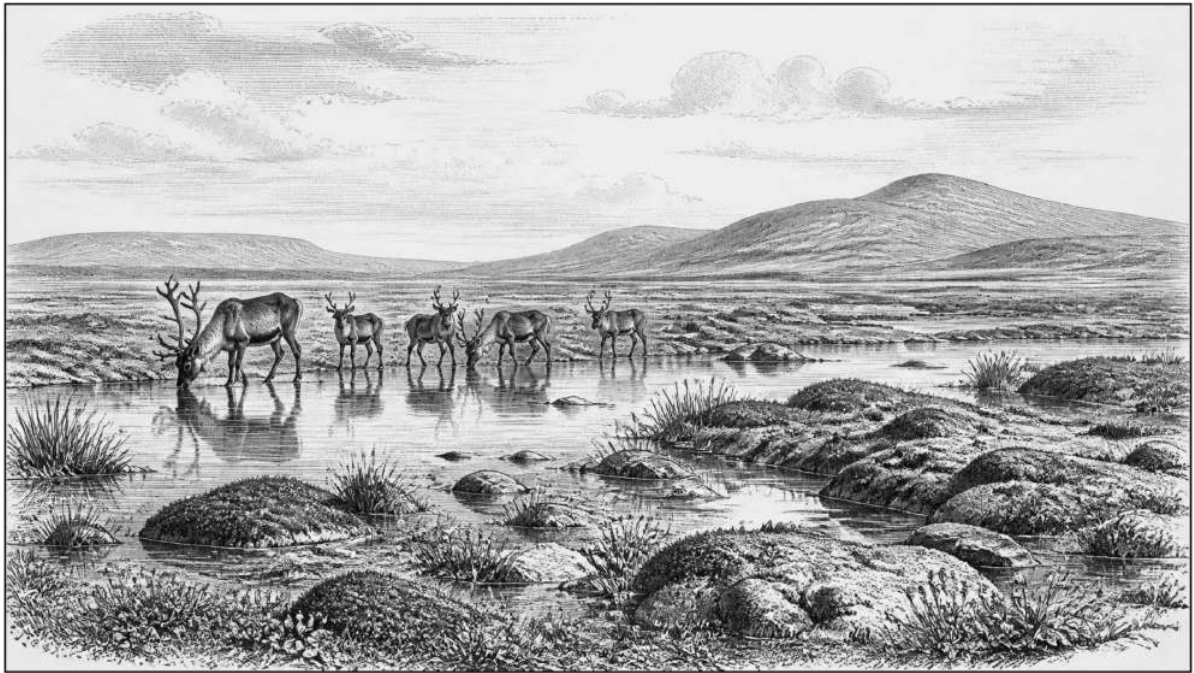
movement of ice around Ireland varied regionally. The till above Derryvree's freshwater sediments is physical testimony to that later transformation. What survived beneath it is precious precisely because most comparable evidence did not.

For Ireland around 31,611 BCE, the principal development was therefore neither a battle nor a dynasty but an environmental opening between glacial advances. In Fermanagh, cold freshwater pools and tundra plants occupied ground later sealed beneath ice. Across the island's changing lowland corridors, large mammals could enter and depart. In Cork, cave deposits retain an intriguing, still contested hint that people may have touched this world. The evidence is slight, local and often difficult to date, but it is enough to replace the old image of an utterly blank Ireland with a more compelling one: a severe, dynamic and intermittently habitable Ice-Age landscape.

Chapter 091 of 100

31610 BCE

Maguirebridge's Frostbound Waters^[91]



“31,610 BCE” is a useful modern label, not a date at which an event in Ireland can be identified. No inhabitants of the island recorded years, named rulers or left written accounts at this depth of time. In archaeological terms the point falls about 33,560 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). Radiocarbon dates from so far back must be calibrated and expressed as probability ranges; they cannot distinguish one modern calendar year from the next. The responsible subject is therefore an interval of environmental change rather than an Irish year of politics or biography.

That interval was significant. Ireland had not yet reached the greatest expansion of the last British-Irish Ice Sheet, but it was moving towards a colder, more unstable glacial world. Evidence from County Fermanagh and from cave deposits in the south shows that parts of the island could support tundra vegetation and sizeable mammals during this broader period. It also raises, without conclusively answering, the question of whether small groups of Upper Palaeolithic people ever reached Ireland before the ice expanded again.

Evidence Between the Tills

The clearest Irish environmental archive relevant to this date is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed a remarkable sequence: freshwater silts and fine sands, rich in organic material, lay between two thick and distinct layers of glacial till. The lower till testified to an earlier advance of ice; the upper till showed that ice later returned and buried the wetland deposit. Between them survives a brief geological window onto an ice-free, intensely cold landscape.

The Derryvree organic sediments produced the conventional radiocarbon determination Birm-166, 30,500 radiocarbon years BP, with a large uncertainty of $+1,170/-1,030$ years. Published calibration estimates place the deposit broadly around c. 36,900–31,700 calibrated years BP. That span includes the approximate horizon represented by 31,610 BCE, but it must not be mistaken for a date on a single layer, season or event. The sediments accumulated over time; later glacial action affected their setting; and radiocarbon calibration itself is refined as reference curves improve. What Derryvree securely demonstrates is that north-central Ireland experienced non-glacial freshwater and periglacial conditions during part of MIS 3, before the main late-glacial ice-sheet build-up.

The fossils make the point more vividly. Poorly preserved pollen was dominated by herbaceous plants, while plant macrofossils included mosses and water-associated species. Insect remains added evidence for cold conditions. Taken together, they support the interpretation of open tundra or muskeg-like wetland: wet, mossy and sedgy ground, shallow freshwater, sparse vegetation on drier surfaces, and a climate with severe winters and a short growing season. A few pollen grains from trees do not establish local woodland. They may have travelled far, been redeposited, or represent vegetation beyond the immediate basin. The landscape was not a familiar Irish countryside of oak woods, hedges and pasture.

An Island of Open Ground

“Ice Age” should not suggest an unbroken white sheet covering every place at every moment. Around this broad horizon, the evidence points instead to a changing mosaic. Low vegetation could colonise exposed ground; wetlands and pools persisted where drainage and local relief allowed; and frost processes shaped soils. In summer, herb-rich patches, sedge margins and open water could have been productive. In winter, wind, prolonged freezing and restricted plant growth imposed a much harsher rhythm. The exact balance differed from one region to another and shifted over centuries or millennia as temperature, snowfall and ice margins changed.

Derryvree cannot stand for the entire island. It is a northern inland locality, and its sediments tell us most directly about their own catchment. Yet other Irish records reinforce the wider conclusion that the last ice sheet did not simply arrive everywhere at once. Organic deposits at Greenagho, also in Fermanagh, and marine evidence from the western seaboard are among the records used to reconstruct intervals of ice-free ground or open water before the later major advance. Modern reconstructions of the British–Irish Ice Sheet describe growth as asynchronous and dynamic. By roughly 27,000 years ago the ice sheet had expanded far more widely; its maximum volume came later, around 23,000 years ago. At 31,610 BCE that transformation was approaching, not complete.

Sea level was much lower than it is now because immense quantities of water were locked in continental ice sheets. But it does not follow that Ireland was joined to Britain by a simple, walkable land bridge at this exact date. The geography of the Irish Sea basin, glacier margins, coastlines and marine passages changed repeatedly. Animal movement into Ireland demonstrates ecological connection at some points in the Late Pleistocene, but not the precise route, season or conditions of every crossing. Any reconstruction of a fixed highway across the sea is more confident than the evidence permits.

Castlepook’s Animal World

The best evidence for large animals comes from caves, especially Castlepook Cave near Doneraile in north County Cork, long known as Mammoth Cave. Excavations from the early twentieth century recovered an exceptional collection including woolly mammoth, giant deer, reindeer, brown bear, wolf,

Arctic fox, mountain hare, lemmings and spotted hyaena. This was a community of open, cold-country animals unlike anything now living in Ireland. Reindeer and hare evoke tundra grasslands and scrub; lemmings and Arctic fox indicate severe conditions; hyaenas, wolves and bears remind us that caves were used by animals as dens, feeding places and shelters rather than as straightforward human sites.

There is an essential chronological warning. Castlepook's historic collections were gathered before modern excavation standards, and the cave deposits have complex histories. Bones from the site do not necessarily belong to one moment, one landscape or one animal community living side by side. The Irish Quaternary Fauna Project showed the value of directly dating specimens, while more recent work has demonstrated that improved pretreatment can substantially revise older bone dates. Castlepook is therefore an archive of repeated animal deposition across a long phase of the Late Pleistocene, not a snapshot of a single hunt or a single year.

Nevertheless, fauna directly relevant to the wider MIS 3 interval establishes that Ireland was not biologically empty. Mammoths and giant deer required substantial forage; reindeer could exploit more open vegetation; large predators followed prey and competed for carcasses. Their presence suggests seasonal movement through suitable habitats, though it cannot yield precise herd numbers, migration routes or population sizes. A bone in a cave may have been carried there by a carnivore, washed in with sediment, or left after an animal died nearby. Taphonomy—the study of what happened to remains after death—is as important as species identification.

The Human Question

One Castlepook reindeer femur has made this period unusually important for Irish archaeology. It has been reported as carrying an incision consistent with cutting by a sharp stone tool, and has been presented in public heritage interpretation as dating to roughly 33,000 years ago. If specialist examination ultimately confirms that the mark was made by a person while the bone was fresh, it would be evidence that someone processed a reindeer in Ireland during the Upper Palaeolithic. That would extend the possible human story of the island much further back than the long-accepted late Upper Palaeolithic evidence from County Clare.

The claim must, however, remain carefully limited. A directly dated animal bone does not by itself date a human visit with annual precision. A single mark is not equivalent to a hearth, stone-tool scatter, dwelling floor, burial, art panel or settlement. Cut marks must be distinguished from carnivore scoring, trampling, sediment abrasion, breakage, excavation damage and later handling through their form, position and microscopic features. Nor can an old cave collection furnish the secure stratigraphic context expected from a modern excavation. Recent work at Castlepook has sought undisturbed Pleistocene deposits precisely because these questions require better context.

The most cautious interpretation is therefore that a short human visit is possible, not that Ireland possessed a permanent population in 31,610 BCE. If people did reach the island, they may have come as highly mobile hunter-gatherers exploiting animal resources at the north-western edge of Upper Palaeolithic Europe. Processing a carcass could have supplied meat, fat, marrow, hide, sinew and bone; but even this is an inference from one potentially modified specimen, not a recovered camp scene. There is no basis for naming an Irish cultural group, tracing descent to later communities, or imagining a settled Palaeolithic society.

What Cannot Be Recovered

Political affairs, diplomacy and formal warfare cannot responsibly be described for Ireland at this date. There are no named communities, territories, leaders, treaties, weapons caches or fortifications. Likewise, no evidence identifies religious practices, language, music, clothing styles, kinship rules or systems of learning. Caves might look symbolically suggestive to modern observers, but the Castlepook evidence does not establish ritual use by people. The absence of evidence is especially acute because later ice movement eroded, buried and redistributed much of the older landscape.

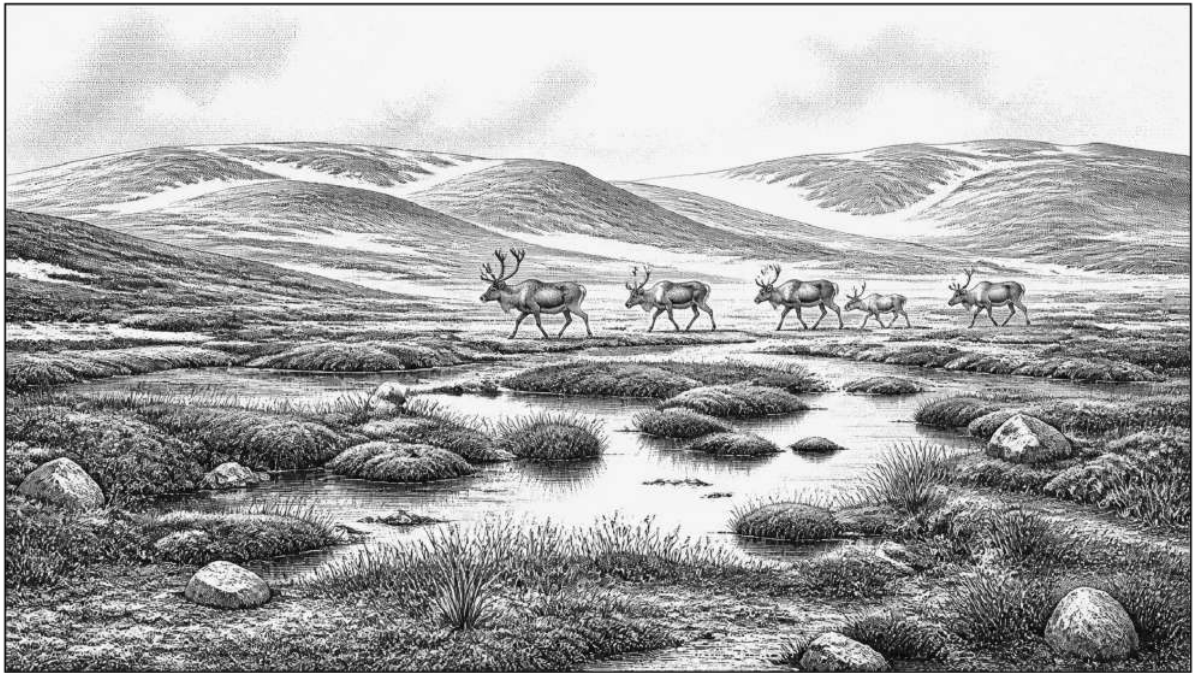
Economy and trade must be treated with the same restraint. No Irish exchange network, imported object or quarry-to-camp trail has been securely demonstrated for this horizon. If visitors processed a reindeer, that would imply subsistence activity rather than trade. A mobile group could have carried stone tools into Ireland, yet no securely associated Upper Palaeolithic lithic assemblage has been recovered. The later Mesolithic record, beginning many millennia after the final ice retreat, offers the first substantial evidence for enduring settlement on the island; it must not be projected backwards onto this much older and more uncertain world.

The enduring importance of 31,610 BCE lies in that contrast. The island was a changing cold-stage environment, not an empty page but not yet a documented human homeland. Freshwater silts beneath a Fermanagh drumlin preserve mosses, sedges, insects and the conditions of a frost-bound wetland. Cork caves preserve the traces of powerful Ice Age animals and a provocative possibility of human contact. Together they show an Ireland of exposed ground, seasonal life and impending glaciation—an archaeological landscape whose evidence is real, but whose calendar-year precision and human stories remain beyond recovery.

Chapter 092 of 100

31609 BCE

Maguirebridge's Fossil Clock^[92]



31,609 BCE is not a year that can be recovered from Ireland's archaeological record. It is a modern calendar label, roughly 33,558 years before the conventional radiocarbon baseline of AD 1950, not a date that any contemporary person could have known or recorded. At this depth of time, even very good evidence normally dates an organism or deposit to a range, often with sizeable uncertainty. Ireland offers no settlement surface, human skeleton, hearth or tool assemblage that can responsibly be assigned to this single year. What it does preserve are scattered, scientifically important clues to the wider Late Pleistocene world in which that notional date falls.

The evidence places Ireland within Marine Isotope Stage 3, a long, climatically unstable portion of the last Ice Age. The island was approaching, but had not yet reached, the maximum development of the last British–Irish Ice Sheet. Reconstructions differ over the size and distribution of early ice, because direct evidence before about 31,000 years ago is sparse. Yet the best current synthesis indicates that the major expansion towards the later glacial maximum followed the period around 35,000–32,000 years ago, while ice-sheet volume peaked much later, around 23,000 years ago. The Ireland of 31,609 BCE should therefore not be imagined as uniformly buried beneath the immense ice sheet of the Last Glacial Maximum. It was instead a changing northern landscape of ice margins, exposed ground, wet hollows, caves and shifting animal habitats.

A Date With Limits

The distinction between calendar years and radiocarbon years matters especially here. The key Fermanagh evidence, from Derryvree near Maguiresbridge, produced a radiocarbon result of 30,500 years before present, with an uncertainty of +1,170 and –1,030 years (Birm-166). “Before present” means before AD 1950, and the measurement is not itself a calendar age. Atmospheric radiocarbon has varied

over time, so such results need calibration against curves such as IntCal20. At ages beyond 30,000 years, calibration produces broad probability ranges rather than a neat conversion. Derryvree can illuminate the broad environmental interval around the requested date; it cannot certify what happened in 31,609 BCE itself.

The same warning applies to the famous finds from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. The cave fauna includes remains attributed to woolly mammoth, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Individual bones have different histories, and an age obtained from one specimen does not date the whole cave assemblage. Many remains were excavated in the early twentieth century, before modern standards of stratigraphic recording, and cave deposits are particularly vulnerable to disturbance by carnivores, water, collapse and earlier digging. Their value is real, but it demands caution.

Waterlogged Tundra at Derryvree

Derryvree is the clearest Irish environmental archive for this general phase. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two thick till sheets. That geological arrangement is crucial: the organic layer records an interval when the locality was ice-free, while the tills above and below show that glacial ice had occupied the area at other times. Later ice did not erase every earlier landscape; it sealed a small, difficult-to-read survival beneath the drumlin.

Plant pollen, seeds, mosses and insects from the deposit point to open tundra or muskeg rather than forest. Grasses, sedges, juniper and herbaceous plants occurred in a largely treeless terrain. Fossils of bogbean, dwarf willow and mountain avens are among the plants used to reconstruct the local setting. The insects and plant remains suggest wet, peaty ground with shallow open water and plant-rich margins, surrounded by mossy vegetation. This was not necessarily an unbroken plain. It was a periglacial mosaic: saturated hollows, pools, exposed mineral soils and low vegetation, shaped by cold winters, short growing seasons and frost action.

That reconstruction is evidence-based, but its scale must be kept in view. Derryvree documents one preserved basin in County Fermanagh, not every valley or coast of Ireland. Nor do all the identified species prove that they grew together in the same season or year. Pollen can travel, remains may be reworked, and the dated layer accumulated over time. Nevertheless, the combined botanical and insect evidence firmly rejects a familiar modern image of a green, wooded island. Around this part of the Ice Age, northern Ireland had places where trees were absent and wet tundra plants could flourish beside cold water.

Animals and a Cave in Cork

Castlepook gives southern Ireland a different kind of record: bones rather than a continuous environmental sediment. The fauna indicates that large herbivores and predators reached Ireland during milder or more accessible phases of the last glacial cycle. Woolly mammoth and reindeer evoke the open, cold-adapted communities often called mammoth-steppe, but the term should not flatten local variety. A cave assemblage is not a census of a living landscape. Hyenas, wolves and other scavengers could transport, gnaw and accumulate bones, while geological processes could mix material of different ages.

Spotted hyaena is especially revealing. Its presence at Castlepook is securely important as evidence of a carnivore now confined to Africa and absent from later Irish ecosystems. A hyaena den or scavenging site also explains why caves can preserve such an unusual concentration of bones: they were places where

animals brought food, sheltered or died, not necessarily places where humans lived. The National Museum of Ireland describes Castlepook as the country's most important site for mammal remains from the last cold stage. It is a record of animal movement and ecological opportunity at the north-western edge of Europe.

The cave also raises the possibility of a much earlier human visit to Ireland than was once accepted. A reindeer femur in the National Museum collection has been identified by zoologist Ruth Carden as bearing a mark consistent with cutting by a sharp stone tool during butchery. County Cork heritage material places the bone at about 31,000 BCE, close enough to the requested date to make it the most evocative object for this article. If that interpretation is upheld, people processed a reindeer in Ireland during the Upper Palaeolithic and perhaps used the animal's meat, hide, marrow, sinew or bone.

But the inference must remain proportionate to the find. No associated stone tool, hearth, dwelling, human bone or securely excavated occupation level has yet been recovered from Castlepook for this early episode. The bone's radiocarbon age dates the animal, not an exact moment of cutting; the cave may have received discarded remains after butchery elsewhere; and identifying a surface mark requires specialist taphonomic judgement. The responsible conclusion is not that a settled Irish population existed in 31,609 BCE. It is that one modified reindeer bone offers a serious, still limited indication that Upper Palaeolithic hunters may have reached the island during this broader period.

People Beyond the Evidence

Nothing in the Irish evidence permits the naming of a people, language or political territory. There were no states, kingships, diplomatic missions or written agreements to recover, and there is no direct evidence for warfare in Ireland at this date. Nor can religion be reconstructed from the Castlepook mark or the Derryvree wetland. Elsewhere in Upper Palaeolithic Europe, hunter-gatherers made sophisticated tools, ornaments, images and seasonal camps, but those wider achievements cannot simply be transferred to Ireland without Irish finds to support them.

Any human presence was likely small, mobile and intermittent. That is an interpretation from geography and ecology, not a demonstrated population history. Reaching Ireland required crossing or negotiating the Irish Sea zone, whose changing sea levels, ice and coastlines made routes variable and uncertain. Low global sea level exposed more continental shelf than today, but this did not automatically create an easy, continuous land route from Britain into Ireland. The old assumption of a straightforward Late Glacial land bridge has been strongly challenged by marine geological research. People, if present, may have travelled by water, over seasonal ice or through a geography unlike any modern map; present evidence cannot decide which.

Approaching a Colder Ireland

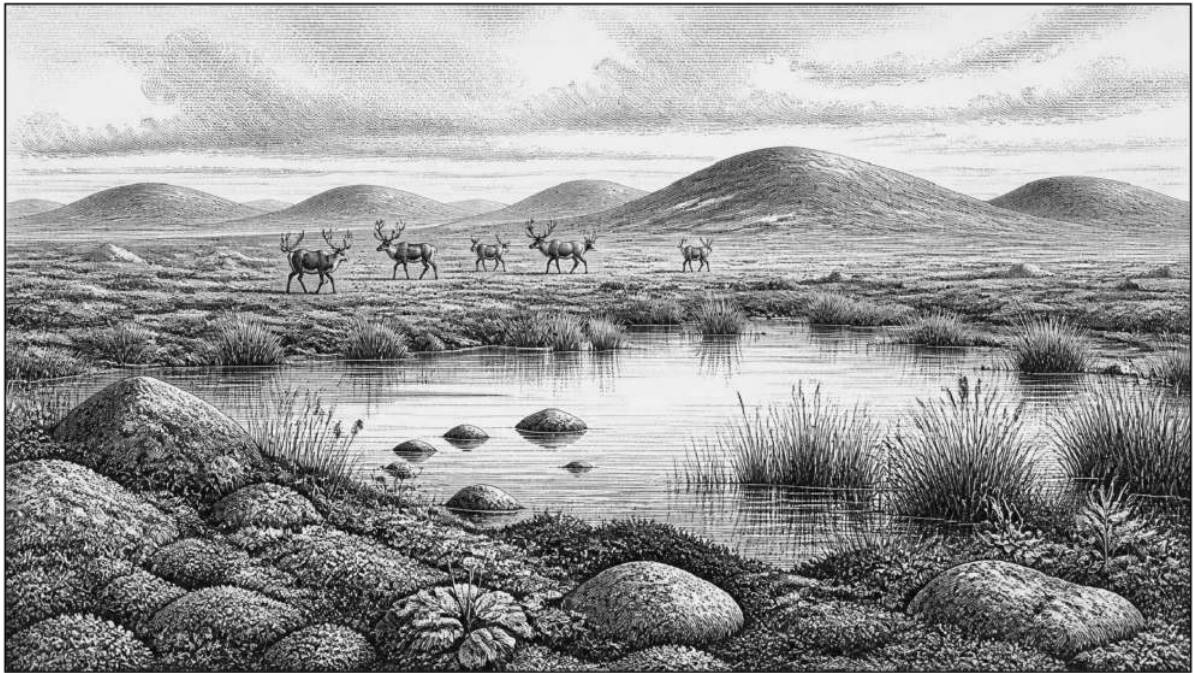
The principal historical development around 31,609 BCE was environmental rather than political: Ireland was entering the trajectory towards more extensive glaciation. Ice growth would alter drainage, destroy or bury habitats and repeatedly narrow the zones available to plants, animals and possible human visitors. The later maximum ice sheet scoured vast areas, helping to explain why the surviving record is so thin. Absence of evidence is therefore not simple evidence of absence. It is partly the result of erosion, submerged former landscapes and the survival of only exceptional archives such as a cave bone collection or an organic layer beneath a drumlin.

For Ireland Year by Year, then, this date marks neither a documented event nor a human milestone with calendar precision. It marks a window onto a precarious Ice Age island: Derryvree's waterlogged tundra, Castlepook's cold-climate fauna and a contested but important reindeer bone. Together they show that Ireland was ecologically connected to the wider north-west European world, while remaining difficult to enter, harder to inhabit and exceptionally difficult for later archaeologists to read.

Chapter 093 of 100

31608 BCE

Castlepook's Mammoth-Steppe^[93]



The label 31,608 BCE offers a useful point of orientation, but it must not be mistaken for a date at which Irish prehistory can be observed year by year. No written records, settlements or securely dated human assemblages allow such precision. In modern chronological terms, the date lies approximately 33,600 calendar years before 1950, within Marine Isotope Stage 3 of the Late Pleistocene. Radiocarbon determinations at this age have substantial uncertainties and require calibration; deposits and bones may also represent long spans of accumulation rather than a single moment. What can responsibly be reconstructed is a changing Ice-Age Ireland, illuminated unevenly by caves, buried freshwater sediments, pollen, plant macrofossils, animal bones and the wider record of the British–Irish Ice Sheet.

A Landscape in Flux

Ireland around this broad period was neither the familiar green island of later millennia nor necessarily a land wholly smothered by ice. It was part of a cold, unstable north-west European world in which glaciers, ice caps, open ground, lakes, rivers and coastal lowlands changed over long timescales. Greenland ice-core records show that the climate of the last glacial period could switch abruptly between relatively milder interstadial phases and harsher stadials. Those records do not provide a local weather report for Ireland in 31,608 BCE, but they explain why a simple image of one unchanging ‘Ice Age’ is misleading.

Ice-sheet reconstructions likewise indicate complexity. The last British–Irish Ice Sheet was building towards its much later maximum, conventionally placed broadly between about 26,000 and 19,000 years ago. Modelling and field evidence suggest that, around 31,000 years ago, a substantial ice mass occupied parts of north-west Ireland, with ice fields or mountain glaciers in several upland areas. Yet conditions

varied sharply by region and through time. Southern lowlands could retain open habitats even while the north-west and high ground sustained ice. It is therefore safer to envisage a patchwork of cold environments than an island uniformly frozen or uniformly habitable.

Fermanagh's Buried Wetland

The most informative Irish environmental evidence close to this general era comes from Derryvree near Maguiresbridge in County Fermanagh. Roadworks exposed a freshwater sequence of silts, sands and organic material sealed between two till sheets in a drumlin. The deposit produced a radiocarbon determination of $30,500 \pm 1,170/1,030$ radiocarbon years BP. That is not a calendar-year equivalent to 31,608 BCE, and its uncertainty is large; nevertheless, it belongs to the Middle Midlandian, the Irish expression of the last glacial cycle, and demonstrates that at some point between separate glacial advances there was standing or slow-moving freshwater in south Fermanagh.

Its fossil content is especially valuable. Pollen was poorly preserved, but herbaceous pollen and plant remains, including mosses, aquatic species and cold-adapted taxa, point to open tundra or tundra-steppe vegetation under periglacial conditions. The evidence does not justify drawing forests, fields or a settled countryside. Trees, if present locally at all, were sparse and the few pollen grains that might suggest woody plants can be difficult to interpret in such old, disturbed deposits. The stronger conclusion is that sedges, herbs, mosses and wet-ground plants dominated around shallow water and exposed mineral ground. Derryvree records a real Irish habitat, but its exact age and duration must remain broader than the numbered year.

This landscape would have been shaped by frost heave, seasonal snow, meltwater and wind. Rivers carried sediment across open ground; pools and marshy hollows offered sheltered ecological niches. In a climate where the growing season was short and temperatures could shift markedly over centuries or even decades, vegetation was not simply a backdrop. It determined forage for large herbivores, cover for small animals and the availability of any resources that visiting people might have used.

Castlepook's Animal World

For the period's larger animals, Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork is central. Excavations from the late nineteenth and early twentieth centuries, supplemented by later study and radiocarbon dating, made it Ireland's richest known cave archive for Late Pleistocene vertebrates. Its deposits include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyena. Not all were present simultaneously, and the old excavations disturbed or mixed some deposits. A list of species from Castlepook is therefore evidence for a broad faunal world, not a census from a single season or a single valley floor.

Even with that caution, the assemblage is striking. Reindeer and lemmings suit open, cold habitats; mammoth implies extensive grazing country rather than closed woodland. Giant deer, despite its later nickname 'Irish elk', was not an Irish endemic and should not be treated as a national symbol already tied to a settled Ireland. Spotted hyena, now associated with Africa, was then part of a European Pleistocene carnivore fauna. Hyena bones, teeth and coprolites indicate that caves could be used as dens or places where carcass remains accumulated. Carnivores, scavengers, herbivores and geological processes all helped create the archive. The cave is not simply a hunting camp preserved intact.

The wider implication is that land connections or very narrow sea crossings must at times have enabled mammals to reach Ireland from Britain and, beyond it, continental Europe. Lower global sea levels altered the geography of the Irish Sea basin, but the exact routes depended on ice extent, local relative sea level and changing topography. It would be rash to picture a permanent, broad land bridge. The important point is mobility: Ireland's fauna was connected to a larger north-west European ecosystem during suitable windows, then repeatedly vulnerable to climatic deterioration and advancing ice.

The Human Question

There is no secure basis for describing a resident Irish population in 31,608 BCE. No houses, hearths, burials, tool-making floors, named communities or enduring settlement network of that antiquity have been established in Ireland. Consequently there can be no responsible account of political authority, diplomacy, territorial borders or organised warfare. Terms such as tribe, chiefdom and nation belong to later interpretative frameworks and would conceal more than they reveal here.

A reindeer femur from Castlepook has nevertheless transformed the question of human presence. A deep incision on the bone has been interpreted as a mark made by a sharp stone tool during carcass processing, and the bone has been publicly associated with an age of about 33,000 years ago. If that interpretation and association are sustained, it indicates that people reached Ireland during the Upper Palaeolithic far earlier than the formerly accepted record suggested. It may represent butchery rather than a settlement: a brief visit, an opportunistic encounter with a carcass, or a small hunting party moving through a wider landscape. It does not by itself establish continuous occupation.

The distinction matters because cave-bone collections pose difficult evidential problems. Many Castlepook finds were excavated before modern recording standards; bones can be moved by hyenas, water, collapse, excavation and later handling. A cut-mark interpretation rests on the form, placement and microscopic character of a mark, while the age of an animal bone does not automatically date the instant at which a mark was made unless their relationship is demonstrated. The careful historical conclusion is therefore twofold: there is important, potentially very early evidence of human activity in Ireland; there is not yet an evidential foundation for a detailed Irish human society at this date.

Life Without Institutions

If people were present, their economy would have been that of mobile hunter-gatherers, not farmers. There were no crops, livestock, metalworking, pottery production or built monuments evidenced for Ireland at this time. Reindeer, where accessible, would have offered meat, fat, hide, sinew, antler and bone; other large herbivores may have been pursued, scavenged or avoided according to opportunity and risk. Such statements are reasonable inferences from Upper Palaeolithic lifeways elsewhere in Europe, not direct proof of a complete Irish subsistence system.

Trade and diplomacy cannot be demonstrated. A travelling group could have carried stone tools or exchanged knowledge across territories now divided by sea, but no securely contemporary Irish artefact assemblage reveals routes, partners or goods. Learning and culture likewise survive only indirectly: the practical knowledge needed to navigate cold terrain, recognise animal movement, manage fire and process carcasses would have been considerable, yet no Irish art, ritual site or language can be recovered. Religion is entirely unknown. Caves can acquire sacred meanings in later societies, but Castlepook's Pleistocene evidence primarily records animal accumulation and geological shelter, not an identified shrine.

An Ireland of Intervals

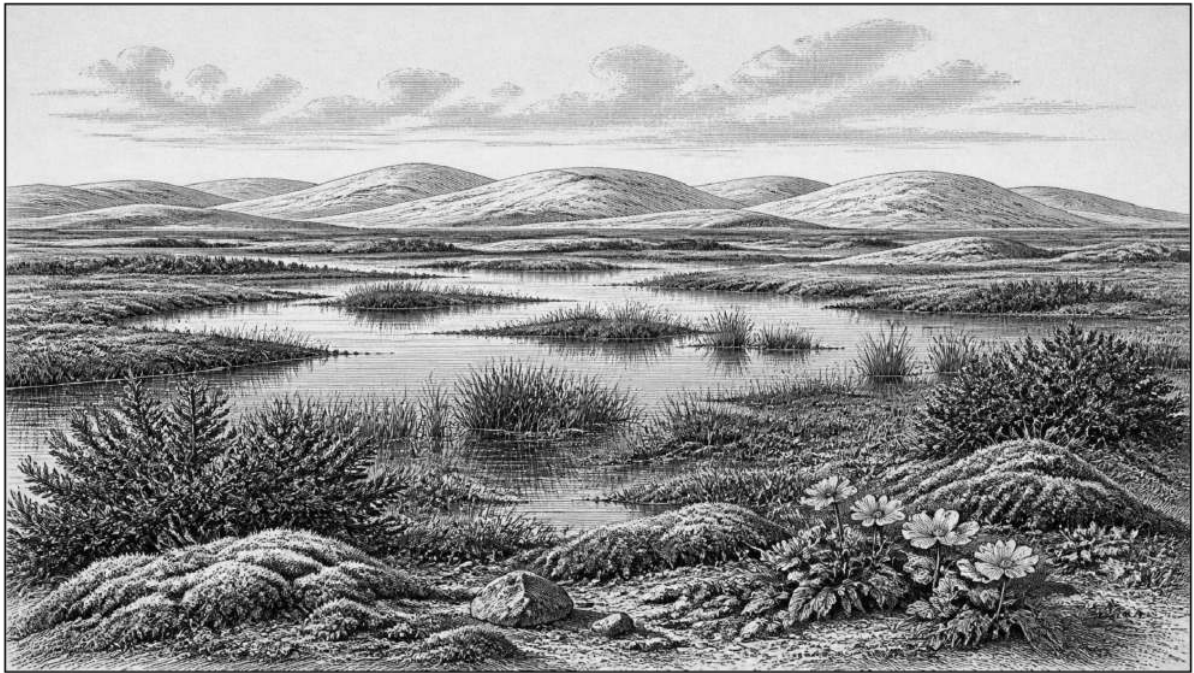
The most accurate picture for around 31,608 BCE is thus one of intervals rather than a conventional historical year. In Fermanagh, a freshwater tundra environment survived between glacial episodes. In Cork, caves accumulated the remains of a rich cold-climate fauna whose members moved through a connected European world. Across the island, growing ice and volatile climate restricted and rearranged habitable ground. A possible humanly modified reindeer bone opens the prospect of fleeting Upper Palaeolithic visits, but not of settled communities or recorded events.

That limitation is not an absence of history. It is the history of an island being made and remade by climate, ice, water and animal movement. The deposits beneath the Fermanagh drumlins and the bones in a Cork cave are fragmentary witnesses, but they establish the essential fact: long before farming, monuments or written names, Ireland was an active part of the Late Pleistocene ecological frontier.

Chapter 094 of 100

31607 BCE

Birm-166's Freshwater World ^[94]



31,607 BCE is a modern calendar label, not a date that can be recovered from Ireland's prehistoric evidence. No event, person, journey or season can responsibly be assigned to this particular year. In radiocarbon practice, it falls roughly 33,556 years before AD 1950, but prehistoric ages are reported as ranges, with margins of error and calibration rather than as exact BCE years. The most relevant Irish evidence belongs to the Middle Midlandian, or Middle Devensian, part of the Late Pleistocene: a cold and climatically variable interval within Marine Isotope Stage 3, before the Last Glacial Maximum.

The named year lies within the broad calibrated span associated with the famous Derryvree freshwater deposits near Maguiresbridge in County Fermanagh. Their principal radiocarbon measurement, Birm-166, was obtained from organic sediment and reported as $30,500 \pm 1,200$ radiocarbon years BP. Calibration and subsequent modelling place its possible calendar age across a wide interval, approximately 36,900–31,700 calibrated years BP. That range includes a notional date around 31,607 BCE, but does not turn Derryvree into a record of one particular year. It offers something more valuable: a rare, local environmental archive for an otherwise poorly preserved phase of Ireland's Ice Age.

A Wetland Between Ice Advances

Derryvree was exposed during road works in 1969, when a cutting passed through a drumlin about two kilometres north-east of Maguiresbridge. Beneath the familiar smooth hill lay two distinct sheets of till, the stony debris deposited by glacier ice. Between them was a layer of fine sands and organic silts formed in freshwater conditions. This sequence matters because the lower till records an earlier glacial episode, while the upper till records later ice advance and burial. The organic layer therefore preserves a period when this part of Fermanagh was not under moving ice.

That is evidence, not a complete map of the island. It demonstrates ice-free ground and freshwater sedimentation at Derryvree during the interval represented by the silts. Together with comparable deposits at Greenagho and elsewhere, it supports the interpretation that substantial areas of north-central Ireland were ice-free before the principal expansion of the last British–Irish Ice Sheet. It does not prove that every coast, valley or upland of Ireland was simultaneously open, nor that the landscape remained stable for centuries. Ice margins, snowfields, rivers and permafrost could have changed rapidly in a climate marked by sharp swings.

The later ice was also a destroyer of evidence. Glaciers eroded bedrock, reworked earlier deposits and covered landscapes with fresh till. The survival of Derryvree's silts beneath a drumlin is consequently unusual. There were surely other pools, marshes and river margins across Ice Age Ireland, but few have survived in a form that can be dated and studied. The absence of a site is not proof that an environment, animal or human group was absent from the whole island.

The Derryvree Landscape

Pollen, plant macrofossils, moss remains and insects recovered from the freshwater sediments give the clearest picture. They indicate a treeless, periglacial landscape rather than a forested Ireland. Grasses and sedges were prominent, accompanied by juniper and a range of herbs adapted to open ground. Mosses flourished around wet ground, while aquatic plants attest to standing or slow-moving water. Fossil evidence includes water-milfoil, the wetland plant bogbean, and mountain avens, whose modern distribution evokes cold, exposed and often calcareous ground.

Researchers have described the setting as muskeg: a cold, waterlogged mosaic of mossy ground, sedge growth and shallow pools rich in plant material. The word should not conjure a single unbroken bog. Derryvree was a local wetland within a broader open landscape, and its sediments over-represent plants growing close to the water. Yet the combined pollen and insect evidence is strong support for sparse woodland or no woodland nearby, short growing seasons and severe winters. The scene was not an empty white waste. During the thaw, pools held aquatic vegetation and wet ground could be productive; in winter, frozen soils and snow would have imposed formidable limits.

Such evidence also warns against imagining present-day Fermanagh simply transplanted into the past. There were no dense hedgerows, improved fields, farm animals, villages, roads or mature oak woodland. The drumlin itself existed as a glacially shaped landform, but its surface and drainage were subject to frost action, seasonal meltwater and changing sediment. The familiar modern patchwork of enclosed green fields belongs to an immensely later agricultural history.

Animals at Ireland's North-Western Edge

Derryvree has not yielded a matching large-mammal assemblage, so the animal record must be drawn cautiously from other Irish sites and dates. The most important is Castlepook Cave near Doneraile in north County Cork. Its old excavations produced one of Ireland's richest Pleistocene bone collections: woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. These species show that cold-adapted animal communities reached Ireland at various points before and during the approach to the Last Glacial Maximum.

They do not establish a single neat "mammoth-steppe" scene in 31,607 BCE. Castlepook is a cave archive accumulated over a long period. Bones came from complex deposits affected by carnivores, water movement, antiquarian excavation and later disturbance. Improved radiocarbon pretreatment has shown

that several early measurements from southern Irish caves were too young, while fresh dating has pushed some specimens much farther back into Marine Isotope Stage 3. A mammoth bone, hyaena tooth and reindeer limb may therefore record different episodes rather than animals that met on the same day or even in the same millennium.

Even so, the faunal record gives a credible sense of ecological possibility. Reindeer and lemmings are consistent with open, cold country; mountain hare, Arctic fox and wolf show the capacity of Irish landscapes to support northern species; mammoth, giant deer and hyaena point to food webs unlike any now surviving on the island. Hyaenas may have used Castlepook as a den, while caves could also trap animals or collect bones washed in from outside. The route by which each specimen entered the cave is part of the scientific question, not a detail to be assumed away.

The Human Question

There is no securely excavated house, hearth, burial, stone-tool assemblage or occupation floor in Ireland that can be dated to around 31,607 BCE. Accordingly, there is no basis for describing a resident population, a named people, a language, a political order or a continuous Upper Palaeolithic settlement of Ireland at this time. Ireland had no states, rulers, diplomacy, warfare in the historical sense, formal religion, writing, schools, markets or trade institutions that can be recovered from the evidence.

A potentially important but unresolved find comes from Castlepook. A reindeer femur from the historic collection has been reported as carrying a mark consistent with cutting by a sharp stone tool during carcass processing, and the bone has been publicised as roughly 33,000 years old. If the mark is confirmed as human-made and contemporaneous with the animal's death, it would indicate a human encounter with a reindeer in Ireland far earlier than the better-established terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

That conditional wording is essential. The Castlepook bone was not recovered from a modern, tightly recorded excavation of an occupation surface. A radiocarbon result dates the animal bone, not automatically the mark, a hunter, a camp or a journey. Natural abrasion, carnivore activity, trampling, breakage and excavation damage can all complicate the identification of cut marks. Current work at the cave has located further stratified Pleistocene deposits and may eventually clarify the history of its sediments and bones. For now, the responsible conclusion is possible fleeting human activity, not established settlement.

Life, Movement and What Cannot Be Known

If people did enter Ireland during a favourable interval in Marine Isotope Stage 3, they would most plausibly have travelled in small, mobile groups whose subsistence depended on knowledge of seasonal animals, weather, shelter and stone resources. That is an inference from wider Upper Palaeolithic Europe, not a demonstrated Irish social history. No Irish evidence of this age identifies their numbers, kinship, clothing, beliefs, artistic practices, routes or duration of stay. A single butchered carcass, if that is what Castlepook eventually proves to be, could represent hours rather than generations.

Nor can economy and exchange be reconstructed. Lower sea levels altered the outlines of land and sea around Ireland, while the growth and movement of the British–Irish Ice Sheet repeatedly reshaped possible routes. But a lower sea is not itself proof of a continuous walkable land bridge or of regular

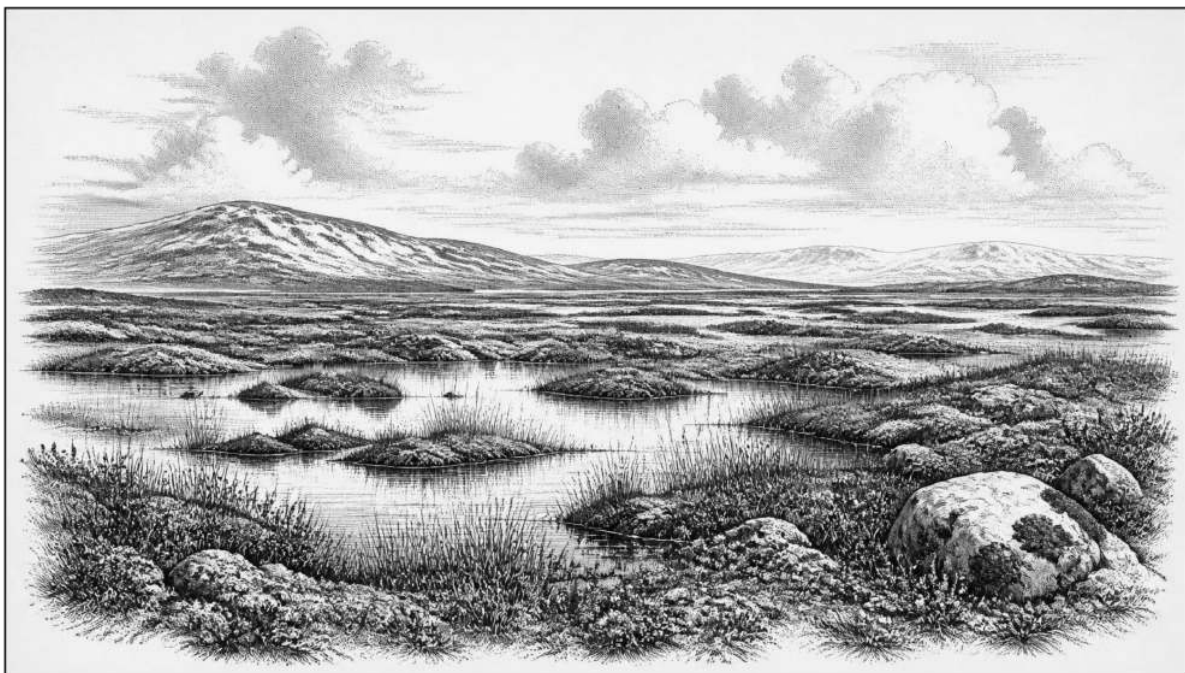
traffic. Any movement between Ireland, Britain and continental Europe would have depended on the changing configuration of ice, water, exposed shelf, river valleys and coastlines. At this date, the geography of connection was as unstable as the climate.

The most secure story for this notional year is therefore environmental. Around the broad period into which 31,607 BCE falls, an ice-free window in Fermanagh supported cold freshwater wetlands amid open tundra-like ground. Elsewhere, animals adapted to harsh northern environments ranged through parts of Ireland, leaving fragmentary remains in caves. The following millennia brought more extensive ice growth, transforming and often erasing those landscapes. Derryvree's organic silts, sealed between tills, remain a small but remarkable survival: not a chronicle of a year, but evidence that Ice Age Ireland was diverse, habitable for specialised life, and far from archaeologically silent.

Chapter 095 of 100

31606 BCE

Calcite, Tundra, and Castlepook^[95]



The label 31,606 BCE is a modern way of locating a very remote point in time, not a year that can be recovered from Irish evidence. There were no calendars, writing, named communities or datable events on the island. In conventional archaeological terms, it lies about 33,550 calendar years before AD 1950, within the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the last Ice Age. The responsible history of Ireland at this point is therefore a history of ranges, deposits and probabilities. Radiocarbon results must be calibrated; even then they commonly span centuries or millennia. Cave bones may date an animal's death but not necessarily the moment when a bone entered a cave or was modified.

An Island Before Maximum Ice

Ireland was not yet in the full grip of the later Last Glacial Maximum. Reconstructions of the British-Irish Ice Sheet show that its growth, maximum extent and retreat varied greatly between regions; the greatest late-glacial expansion belongs broadly to the period after this horizon. Around 33,550 cal BP, ice margins, snow cover, sea level and drainage were changing on timescales far beyond any single human lifetime. Some parts of Ireland could be ice-free while uplands and northern or western sectors were influenced by expanding ice. It is misleading to picture either a uniformly frozen island or a modern green landscape placed in colder weather.

Lower sea level exposed large areas now beneath the Atlantic and Irish Sea. That altered coastlines and may have made animal movement easier in some directions, but exposed shelf is not proof of a simple, continuous, dry route between Ireland, Britain and continental Europe. Ice, estuaries, rivers, tidal

channels and shifting shorelines complicated travel. The physical setting was a changing north-western edge of Europe, rather than an isolated island in the later historic sense. It offered routes and barriers whose exact arrangement cannot be mapped precisely for 31,606 BCE.

Derryvree's Cold Wetland

The strongest Irish environmental record relevant to this horizon comes from Derryvree near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed freshwater silts and fine sands, including organic sediments, sealed between two bodies of glacial till. That sequence is important because a later ice advance buried and protected a small portion of a much older landscape. A radiocarbon determination of 30,500 radiocarbon years BP, with a substantial uncertainty, has been calibrated broadly to about 36,900–31,700 cal BP. The range includes the approximate chronological horizon represented by 31,606 BCE, but does not turn the sediments into an annual record.

Plant macrofossils, pollen, mosses and insect remains indicate a cold, open and largely treeless environment. Sedges, grasses, herbs, mosses and low shrubs grew around shallow freshwater, saturated ground and seasonally frozen soils. Bogbean and water-milfoil are among the plants identified from the deposit, reminding us that a glacial landscape could contain productive pools and wet hollows rather than unbroken snow. Pollen preservation was poor, and isolated grains of pine or hazel cannot securely demonstrate nearby woodland: such pollen may have travelled long distances or been redeposited. The firmer conclusion is that Derryvree was tundra or muskeg-like country, with vegetation concentrated wherever moisture, shelter and a short summer growing season allowed it.

Evidence From Caves

In north County Cork, Castlepook Cave near Doneraile—also called Mammoth Cave—provides the most evocative faunal evidence for Ireland before the later ice maximum. Its collections include remains attributed to mammoth, giant deer, reindeer, wolf, brown bear, Arctic fox, lemming and spotted hyaena. Such a list should not be treated as a single living community photographed at one moment. Caves accumulated bones through carnivore activity, accidental deaths, water movement and nineteenth- and early twentieth-century excavation. Subsequent scientific dating has shown that some early determinations were too young and that specimens from different episodes were mixed within the cave system.

Nevertheless, the broader result is secure: a varied cold-stage mammal fauna reached Ireland during MIS 3, at least between roughly 45,000 and 20,000 years ago, with some animals present before the Last Glacial Maximum. The animals imply open habitats capable of supporting grazers and browsers, scavengers and predators. Reindeer were suited to sparse northern vegetation; giant deer and red deer signal different ecological opportunities; hyaenas, wolves and foxes point to a food web in which carcasses were contested and bones were moved. Mammoth remains add scale to the picture, but do not prove that mammoths, reindeer and every carnivore named in the collections occupied Castlepook simultaneously.

Crag Cave in County Kerry supplies independent environmental evidence. Uranium-series dating of its broken stalagmites shows episodic calcite growth during parts of MIS 3, associated with Greenland interstadials—relatively milder phases within the wider cold stage. Calcite requires water moving through the cave and conditions sufficiently favourable for deposition. It does not prove a mild climate across

every part of Ireland, nor establish woodland or human settlement. It does, however, reinforce the central point from Derrynvree and the cave fauna: Ice Age Ireland experienced marked climatic fluctuations, including windows when land, fresh water and animal populations could persist beyond an ice margin.

The Castlepook Reindeer Question

A reindeer femur from Castlepook has been reported by County Cork heritage material and the researcher Ruth Carden as carrying a deep mark consistent with cutting by a sharp stone edge. Public accounts place the animal at about 31,000 BCE, close enough to make it highly relevant to the present notional year. If the incision is confirmed as a butchery mark, it would be Ireland's earliest presently claimed trace of human action: evidence that one or more people handled a reindeer during an earlier Ice Age interval.

The claim deserves attention precisely because it remains limited. The specimen derives from an old cave collection, not a modern excavation of an intact occupation floor. No securely associated stone-tool assemblage, hearth, dwelling, burial, repeated processing area or human remains of comparable age has yet been recovered in Ireland. A date on the bone records the death of the reindeer, not automatically where it was killed, when the mark was made or how long any visitors remained. The most cautious interpretation is therefore of a possible brief human encounter, not a proven permanent population or a continuous Palaeolithic settlement.

Society Without a Settlement Record

If people did visit Ireland around this period, they would almost certainly have belonged to small, mobile Upper Palaeolithic foraging groups, comparable in broad subsistence terms to communities known elsewhere in north-west Europe. That is an inference from regional archaeology and ecology, not direct Irish evidence. Such people could have followed animal movements, made and maintained stone tools, shared food and knowledge, and chosen sheltered places during short stays. Ireland has not yet yielded the material traces required to reconstruct their houses, clothing, kinship, language, artistic traditions or seasonal round. Nor is there evidence for farming, herding, pottery, metalworking, monuments or a settled village economy.

For the same reason, political affairs, diplomacy and organised conflict cannot responsibly be narrated for 31,606 BCE. There is no evidence for rulers, territorial states, formal alliances or warfare. Religion is equally beyond recovery: no burial, shrine, figurative art or ritual deposit of this age has been securely identified in Ireland. A marked bone, if humanly modified, shows practical activity and perhaps hunting or carcass processing; it cannot reveal belief. Trade also remains unproven. People may have carried stone, hides, meat or social knowledge across changing landscapes, but Ireland offers no securely dated exchange network from this interval.

A Fragile Historical Horizon

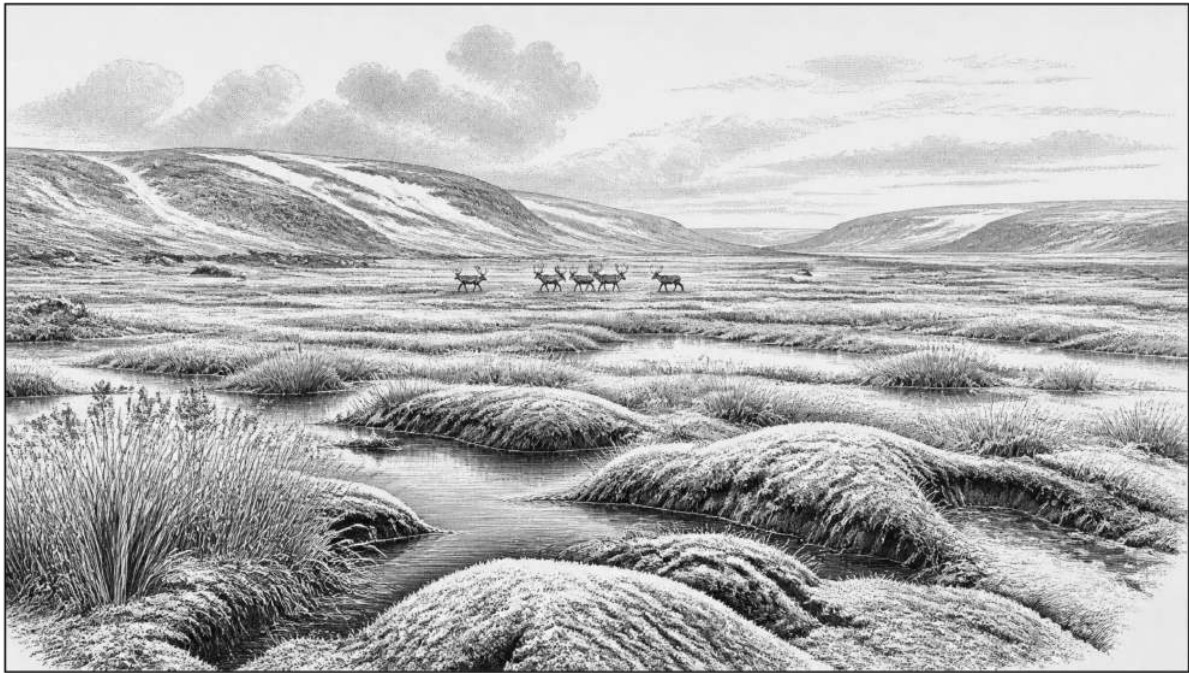
What can be said with confidence is both modest and important. Around the broad horizon denoted by 31,606 BCE, Ireland contained cold but biologically active landscapes: open tundra-like ground, freshwater wetlands, limestone caves and animal populations capable of sustaining predators and perhaps occasional human visitors. Derrynvree records the wetland world beneath later ice; Crag Cave records climatic windows through its calcite; Castlepook preserves a difficult but remarkable bone archive. The

subsequent advance of ice destroyed, buried or rearranged much of what once existed. Ireland's evidence is sparse not because nothing happened, but because the Ice Age itself was an exceptionally efficient editor of the archaeological record.

Chapter 096 of 100

31605 BCE

Mammoth Cave's Unsettled Signal^[96]



Modern calendar-year precision is not available for Ireland in 31,605 BCE. The label is a useful point on a modern timeline, not the anniversary of a known event: there was no written calendar, no named community and no historical record from the island. In the conventional archaeological notation of years before AD 1950, it falls roughly 33,554 years before present, within Marine Isotope Stage 3 (MIS 3), a long and climatically variable part of the Last Glacial period. At this depth of time, evidence is dated as ranges, probabilities and broad phases. The question is therefore not what happened in one Irish year, but what the surviving deposits responsibly allow us to say about Ireland around the middle 30,000s calibrated years ago.

A Landscape Before Maximum Ice

The great ice-sheet maximum lay ahead, rather than being a single condition already fixed across the island. The British–Irish Ice Sheet grew rapidly during the later part of MIS 3 and reached its greatest overall area much later, around 26,000 years ago. Its margins did not advance everywhere at once. Accordingly, it is misleading to picture all Ireland in 31,605 BCE as buried beneath an unbroken ice cap, but equally misleading to imagine a mild green island. This was an unstable cold-world setting in which glaciers, periglacial ground and open habitats could all matter, varying by region and changing over generations beyond the resolution of the evidence.

Ireland's physical geography was also unlike that of today. Global sea level was lower during the glacial period, and the shelves, coastlines and routes between Ireland, Britain and continental Europe were altered. Yet the precise nature of access at any given moment remains uncertain. It cannot responsibly be claimed that people simply walked to County Cork on a demonstrated land bridge, nor that they

necessarily crossed open sea by boat. The relevant evidence is geological and palaeogeographical, not a mapped route used by a documented party of travellers. What can be said is that animal populations did reach Ireland during portions of MIS 3, showing that the island was not an ecological void.

Derryvree's Buried Wetland

One of the most revealing Irish environmental records comes not from a cave but from sediments at Derryvree, near Maguiresbridge in County Fermanagh. There, freshwater silts and sands containing organic material were preserved between two tills, the sediments laid down by glaciers. The enclosing tills show that the site experienced ice before and after the wetland interval; the intervening layers preserve a landscape that later glaciation sealed from view. A radiocarbon determination of about 30,500 ± 1,100 radiocarbon years BP has been calibrated broadly to a span that includes the mid-30,000s to low-30,000s calendar years BP. It illuminates the period around this article's date, but cannot identify conditions in 31,605 BCE itself.

Pollen, plant remains, mosses and insects from this kind of archive point to open, treeless vegetation: cold-tolerant herbs, sedges, dwarf shrubs and wet-ground communities rather than closed woodland. The word “tundra” is useful if understood as a broad ecological comparison, not as proof that every hill and valley looked identical. Parts of the terrain likely included damp, peaty margins, shallow water and mineral ground exposed to frost action. Such places could provide plant food for herbivores and seasonal feeding grounds, while remaining harsh environments for large mammals and any humans who entered them. The archaeological importance of Derryvree is that it supplies direct Irish evidence for habitat rather than relying wholly on analogies from Britain or mainland Europe.

Castlepook's Animal Archive

In north County Cork, Castlepook Cave near Doneraile—historically called Mammoth Cave—provides the outstanding faunal archive for this broad pre-maximum interval. Excavations in the early twentieth century recovered a substantial collection that includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. The list is impressive, but it must not be turned into a single illustrated procession through the cave entrance. Bones accumulated over time, and species did not necessarily coexist at Castlepook on the same day, in the same season or even in the same millennium. Revised radiocarbon work has shown that some southern Irish cave fauna belongs in MIS 3, while also indicating that giant deer and spotted hyaena may have disappeared locally before about 40,000 calibrated years BP.

The most secure conclusion is that parts of Ireland supported a shifting cold-stage fauna between roughly 45,000 and 20,000 years ago. Reindeer are especially significant to a date such as this one because they are animals of open northern environments and because their bones could have represented a valuable resource to predators, scavengers and people. Mammoth and giant deer evoke a large-bodied fauna, but their presence does not demonstrate systematic human hunting. Spotted hyaena is an equally important corrective to romantic scenes of human mastery: caves could be carnivore dens, traps, shelters, drainage channels and bone repositories. Tooth marks, transport by scavengers, weathering, collapse and water movement can all shape an assemblage before archaeologists ever see it.

The Reindeer Femur Question

Castlepook matters to Irish human history because a reindeer femur from the old collection has been publicly reported as dating to about 33,000 years ago and as carrying a deep mark interpreted as fresh-bone butchery with a sharp stone tool. If that diagnosis and association are confirmed through full scholarly publication and further work, it would be extraordinarily early evidence that Upper Palaeolithic people handled a reindeer carcass in Ireland. It would fit the wider fact that *Homo sapiens* lived elsewhere in north-west Europe during MIS 3. But it would still be evidence of an action on an animal, not automatically of a settlement, population or homeland.

Caution is essential because Castlepook's principal bone collection came from excavations undertaken before modern standards of stratigraphic recording, systematic sieving and contamination control. The date of a bone measures the death of that animal within a statistical range; it does not alone date every nearby specimen, the mark upon it, or the time when it entered the cave. Nor does one possible cut mark establish whether a person killed the reindeer, found a carcass, removed a limited portion of meat or tendon, or processed it elsewhere before a carnivore carried the bone underground. Fresh excavation at Castlepook has sought surviving undisturbed deposits precisely because firmer associations—tools, hearths, charcoal, more modified bone or occupation surfaces—would transform the strength of the case.

For now, the reindeer femur should be described as a potentially crucial indication of brief human activity around this broad period, not as proof of continuous habitation. That restraint also explains why the National Museum of Ireland's general public account still states that clear Palaeolithic human presence has not yet been demonstrated. It reflects a properly high evidential threshold: a securely excavated assemblage is stronger than a remarkable but contextually difficult specimen. The later cut-marked bear bone from Alice and Gwendoline Cave in County Clare remains the better established evidence for Upper Palaeolithic activity, though it is many millennia younger than the date considered here.

Life, If Visitors Were Present

There is no basis for writing political history for Ireland at this date. No rulers, polities, territorial boundaries, diplomacy, warfare, law or collective institutions can be identified. Likewise, there is no Irish evidence for farming, herding, metalworking, monuments, formal burial, cave art, literacy, ritual sites or long-distance trade in 31,605 BCE. Terms such as "Irish", "Gaelic" or "Celtic" would be deeply anachronistic if applied to any people who may have visited the island.

If humans did reach the Cork landscape, the reasonable inference is of mobile hunter-gatherers operating in very small groups and making decisions around weather, animal movement, shelter and fuel. Their practical knowledge may have included stone-tool use, carcass processing and the navigation of cold open country. Those are possibilities supported by the proposed modified femur and by the wider Upper Palaeolithic context, not documented facts about a Castlepook camp. No Irish dwelling, hearth, tool kit, ornament or human bone of this age permits a reconstruction of clothing, language, family organisation, beliefs or artistic practice. European examples can suggest what was possible; they cannot supply missing Irish evidence.

The same distinction governs economy and exchange. A reindeer carcass, if processed by people, would have yielded meat, fat, hide, sinew and bone, but there is no evidence that these materials entered an organised Irish economy or exchange network. Hunting itself need not have been a local undertaking:

visitors might have ranged from a wider population based beyond Ireland. Equally, the bone could ultimately prove to bear non-human damage. The most responsible account preserves both possibilities rather than choosing a dramatic narrative prematurely.

A Record of Change, Not a Founding Year

The central development around 31,605 BCE was environmental vulnerability. Ireland was part of a north-west European world in which climate oscillated, ice was expanding and habitats could be fragmented or erased. Subsequent glaciation stripped landscapes and disturbed or buried earlier evidence, helping to explain why the island's Palaeolithic record is so slight. Caves and rare sub-till wetlands are therefore disproportionately important: they are not a full national archive but fragments that survived an exceptional process of destruction.

For this point in deep time, Ireland offers no year-by-year chronicle. It offers a cold wetland beneath Fermanagh till, a cave-bone archive in the Awbeg valley, and one debated reindeer femur that may eventually alter the story of first human visits. Those traces establish a landscape inhabited by animals and undergoing profound climatic change. They make a short human presence plausible enough to investigate seriously, but they do not yet reveal a permanent community. That uncertainty is not a failure of the record; it is the most important historical fact the record provides.

Chapter 097 of 100

31604 BCE

Derryvree's Interstadial Basin^[97]



The label 31,604 BCE is a modern filing device, not a date that could be recognised by anyone living in prehistoric north-west Europe. Ireland has no written record, named individuals, monuments, settlements or calendar chronology from this depth of time. In radiocarbon terms, the nominal year lies roughly 33,600 calendar years before present, but even that conversion must be handled carefully. Radiocarbon measurements require calibration, produce probability ranges rather than precise anniversaries, and may be revised as methods improve. The responsible history of Ireland at this point is therefore not a story of a particular year. It is an account of a changing Late Pleistocene landscape, reconstructed from exceptionally rare sediments, fossils and cave deposits.

A Date Within a Broad Interval

This horizon belongs to Marine Isotope Stage 3, an unstable part of the last glacial cycle. It preceded the global Last Glacial Maximum, conventionally dated to about 26,500–19,000 calendar years before present, but it was already a world of severe cold, fluctuating climate and expanding ice. Ireland was not uniformly buried beneath an ice sheet throughout this longer period. Glaciers advanced and retreated at different times in different regions, while areas beyond or between active ice could support open, cold-climate vegetation and animals. The island's later glacial cover also destroyed, displaced or deeply buried much earlier evidence. That is a principal reason why the Irish archive is so fragmentary.

The closest securely dated environmental record for the broad period around this nominal year comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a sequence of deposits that had been sealed beneath later glacial material. Organic-rich freshwater silts and fine sands lay between two tills: a lower deposit made by an earlier glacier and an

upper till left by a later ice advance. This order matters. It demonstrates that, for a significant interval between glacial episodes, water, plants and small animals occupied a basin in what is now south Fermanagh.

Material from the Derryvree freshwater beds produced a conventional radiocarbon age of 30,500 years BP, with a large uncertainty of +1,170 and –1,030 years. Published calibration places the deposit broadly around 36,900–31,700 calibrated years BP. The notional year 31,604 BCE falls within that wide span, not at a precisely identifiable point in it. The sequence cannot tell us what occurred on a particular day, season or decade. It can, however, show that northern Ireland contained a periglacial freshwater environment during part of the later Middle Midlandian, before renewed ice covered the landscape.

Wet Ground in an Open Country

Derryvree is especially valuable because it preserves several kinds of environmental evidence together. Pollen was poorly preserved but was chiefly herbaceous. Plant macrofossils included mosses, sedges and aquatic or wet-ground plants, while insect remains added evidence for cold northern conditions. Mountain avens, a plant strongly associated with exposed cold environments, and bogbean, which grows in shallow freshwater and marshy ground, are among the best-known finds. The fossil assemblage does not depict a modern Irish bog or a closed woodland. It indicates a treeless landscape in which waterlogged hollows, open pools, mossy margins and sparse dry ground formed a local mosaic.

“Tundra” is a useful short description, provided it is not mistaken for a featureless plain. Derryvree’s freshwater plants show that local relief, drainage and snowmelt mattered. A shallow basin could retain water and organic matter while adjacent ground remained exposed to wind, frost and seasonal drying. Grasses, sedges, herbs, mosses and low shrubs would have offered uneven patches of forage and shelter. The evidence supports a harsh, continental-style climate with cold winters; it does not allow a measured annual temperature or rainfall figure for the nominal year. Nor should a site in Fermanagh be treated as a complete map of Ireland. Conditions in uplands, western coastal districts and the south may have differed sharply according to ice extent and proximity to the Atlantic.

Ice, Water and a Changing Geography

At this time Ireland’s geography was being reshaped by ice rather than by human boundaries. The Irish Ice Sheet was building towards its later maximum, but its growth was neither simple nor simultaneous around the island. Evidence from the wider British–Irish Ice Sheet shows that its margins advanced asynchronously, with some sectors reaching extensive positions earlier than others. In Ireland, subsequently overridden organic deposits such as those at Derryvree are important reminders that cold conditions did not always mean continuous glacier ice at every place.

Lower global sea levels changed the outlines of the continental shelves and narrowed or altered sea passages around Ireland and Britain. Yet it is unsafe to turn that general fact into a confident picture of a dependable land bridge or a particular migration corridor at 31,604 BCE. Ice margins, marine waters, river systems and exposed shelf terrain changed through time. The movement of animals into Ireland proves that routes existed during favourable phases, but the exact paths and duration of those routes are still matters of reconstruction. The landscape was connected to wider north-west European ecological systems, but its degree of accessibility varied.

Cave Fauna in the South

Another major Irish source lies far to the south, at Castlepook Cave near Doneraile in north County Cork. Excavations undertaken there in the early twentieth century recovered an impressive, though difficult, collection of Ice Age animal remains. Mammoth, reindeer, giant deer, brown bear, wolf, fox, hare, lemming and other species have been identified from the wider cave archive. The cave is particularly associated with spotted hyaena, whose gnawing and bone-accumulating behaviour helps explain why so many remains survived together.

These finds illuminate the broad ecological world of Late Pleistocene Ireland rather than providing a census for one calendar year. Caves are complicated archives. Carnivores can drag in prey; water can move bones and sediment; animals can die naturally in chambers; and antiquarian excavation often disturbed layers before modern recording standards existed. Recent re-dating has shown that some older radiocarbon determinations from Castlepook, Foley Cave and Shandon Cave were substantially too young. Improved pretreatment of bone collagen has pushed several specimens further back into Marine Isotope Stage 3 and demonstrated why every individual date must be evaluated critically.

The most defensible conclusion is that mammals reached and occupied parts of Ireland during favourable Late Pleistocene intervals, including cold open-country habitats broadly comparable to the settings suggested at Derrynvree. It does not follow that all animals found in Castlepook lived together, that they were all present at the nominal date, or that Ireland supported the same species continuously. Giant deer and spotted hyaena, for example, may have disappeared locally before the later peak of the last glaciation. Fossils reveal presence at some point within dated ranges, not permanent residence or a stable community.

The Human Question

A reindeer femur from Castlepook has recently been highlighted as carrying a deep mark interpreted as the result of cutting or chopping fresh bone with a sharp stone implement. The animal has been reported as dating to roughly 33,000 years ago, making the find potentially relevant to the broad chronological horizon represented by 31,604 BCE. If the mark is confirmed as humanly made, it would be important evidence that people processed an animal in Ireland before the Last Glacial Maximum. It would push the island's known human story much further back than the formerly accepted terminal-Pleistocene evidence.

But it cannot responsibly be inflated into a conventional narrative of settlement. No securely associated lithic-tool assemblage, hearth, dwelling floor, burial ground or enduring camp is known from this period in Ireland. Recent work at Castlepook has sought undisturbed Pleistocene deposits, yet its 2022 excavation recovered no cultural artefacts and also demonstrated the extent of later disturbance and contamination within parts of the cave. A single marked bone, even if ultimately accepted, may record a short visit, scavenging or butchery episode rather than a resident population. It cannot identify a language, kin group, political organisation or route of arrival.

What Cannot Be Written

There is consequently no evidence for political affairs, diplomacy, warfare, chiefs, territories or institutions in Ireland at this time. Nor can archaeology identify an Irish religion, ritual practice, art tradition, teaching system or trade network. A cave used by hyaenas and preserving animal bone is not, on that basis, a shrine; a reindeer possibly butchered by people is not proof of organised hunting bands or exchange. These absences are historically meaningful. They mark the limits of a record made primarily by geology and palaeontology rather than by human-built sites.

Everyday human life can only be discussed conditionally. If people did reach Ireland during this interval, they would have had to meet the practical demands shared by Upper Palaeolithic groups elsewhere in cold north-west Europe: finding food, maintaining fire, making and carrying tools, clothing themselves, and moving through a dangerous seasonal environment. Such comparisons provide context, not direct Irish evidence. They must not be mistaken for proof that a particular social custom, dwelling type or hunting strategy existed at Derryvree or Castlepook.

An Archive of Survival

The central development around this nominal date was environmental, not political: Ireland contained places where cold-climate life persisted between episodes of glaciation. At Derryvree, a freshwater basin accumulated sediment, mosses, plant remains and insects before later ice sealed them beneath a drumlin. At Castlepook, caves preserved a partial record of animals that moved through the southern landscape, though their histories are mixed and their dates require continual reassessment. Together they replace the old image of an invariably sterile, ice-covered Ireland with a more precise one: a region of severe but shifting conditions, with locally habitable open ground and wetlands, followed by renewed glacial transformation.

That is why 31,604 BCE matters in Irish history. It is not a year of named deeds. It is a point within a broad calibrated interval in which the island's deepest recoverable past becomes briefly visible: sedges and mosses beside cold water in Fermanagh; large mammals in the wider Irish landscape; possible, still unproven-in-detail human intervention at a Cork cave; and an approaching phase of ice that would erase most traces of any open-air life. The history is necessarily cautious, but it is far from empty.

Chapter 098 of 100

31603 BCE

Birm-166's Freshwater Window^[98]



“31,603 BCE” is a modern chronological label, not a recoverable Irish calendar year. No written record, annually resolved archaeological layer or dated settlement sequence can tell us what happened in Ireland in that particular year. Counted mechanically from the conventional radiocarbon baseline of AD 1950, it falls around 33,552 years before present (cal BP). The responsible subject is therefore a broad Late Pleistocene window within Marine Isotope Stage 3 (MIS 3), not an event, ruler or community identifiable to a single year. Ireland’s evidence consists chiefly of deposits beneath later glacial sediments, cave-bone assemblages and the landforms left by ice.

A Date Range, Not a Dateline

Radiocarbon measurements are not calendar dates waiting to be read straight from a specimen. Atmospheric carbon-14 changed through time, and a laboratory result must be calibrated against independently dated records. At more than 30,000 years ago, even good calibration produces wide probability ranges rather than a precise year. The most useful near-contemporary Irish result is from Derryvree near Maguiresbridge, County Fermanagh: organic sediments there gave a conventional age of 30,500 radiocarbon years BP, with a substantial uncertainty. Published calibration places that material broadly between about 36,900 and 31,700 cal BP. Thus 31,603 BCE lies within the possible age range of the deposit, but neither at a demonstrable beginning nor end of the environment it records.

This distinction matters. A nominal BCE year is useful for arranging an archive, but it must not create a false picture of precision. The Derryvree date could represent organic matter accumulated over a span of time; the exposed section records local conditions rather than an island-wide weather report. Its

importance is nevertheless considerable. It is one of the rare Irish sequences which preserves a landscape from before the great late-glacial expansion of the Irish sector of the British–Irish Ice Sheet.

Freshwater Between Two Glaciers

Derryvree was revealed in road excavations through a drumlin, a streamlined hill later shaped by glacier ice. The section showed two distinct layers of till, debris deposited directly by ice, with freshwater silts and fine sands between them. That simple arrangement supplies a powerful relative sequence: an earlier ice advance deposited the lower till; ice had withdrawn sufficiently for water, sediment, plants and small animals to occupy the site; a later advance covered the deposit with fresh till and preserved it beneath the drumlin. The landscape around Maguiresbridge was therefore not continuously sealed under ice throughout the last cold stage.

The organic beds yielded pollen, plant remains and insects described as having a full-glacial character. Their combined evidence indicates open tundra or muskeg: wet, largely treeless ground, with pools and saturated margins amid sedges, mosses, herbs and low vegetation. Frost was an active force in soil and drainage. This was not the later wooded Ireland of hazel, oak and ash, nor a featureless white desert. It was a cold, exposed mosaic in which shallow water, marshy ground, gravel and sparsely vegetated surfaces could lie close together. Such habitats could alter markedly with season, drainage and the shifting position of nearby ice.

Greenagho, also in Fermanagh, offers supporting but earlier evidence. Organic material from lake deposits below till was dated to roughly 37,200–35,700 cal BP. Together, Greenagho and Derryvree demonstrate that north-central Ireland contained ice-free freshwater environments during portions of MIS 3. They do not prove that every coast, upland or river basin was simultaneously open. The island's relief, Atlantic exposure and changing glacier margins ensured regional variation.

Before the Last Maximum

This period came before the climatic and glacial culmination generally called the Last Glacial Maximum. Globally, maximum ice volume and lowest sea level are commonly placed around 26,500–19,000 years ago, although individual ice sheets reached their greatest limits at different times. In Ireland, the later ice sheet profoundly reworked older landscapes, carrying debris, gouging basins and depositing the tills that now conceal the Derryvree sediments. The freshwater record is therefore valuable partly because such evidence is unusual: the processes that made the modern landscape also destroyed or buried much of the evidence for what preceded them.

MIS 3 itself was climatically unstable. Greenland ice cores and North Atlantic records show repeated abrupt shifts between colder stadials and relatively milder interstadials. Irish deposits cannot be matched to every one of these oscillations with certainty, but they belong to the same volatile climatic world. Calcite growth in Crag Cave, County Kerry, provides an additional regional indication that episodes sufficiently mild for liquid water and cave-drip formation punctuated the longer cold phase. The evidence supports variability, not a fixed national climate.

Animals in Cave Country

Southern Irish caves add a different kind of evidence. Castlepook Cave near Doneraile, County Cork, produced remains attributed to reindeer, mammoth, spotted hyaena, wolf and other Pleistocene animals. The Irish Quaternary Fauna Project concluded that a varied mammal fauna reached Ireland sometime between at least 45,000 and 20,000 years ago. That broad conclusion makes an Ireland inhabited by large, cold-adapted mammals entirely credible around the chronological horizon represented by 31,603 BCE.

Yet cave assemblages require caution. Many Irish cave bones were excavated long ago, often from complex deposits with limited recorded stratigraphy. Carnivores could drag carcass portions into caves, gnaw and scatter them; water, collapse and earlier digging could mix materials of different ages. Modern re-dating has shown that some earlier radiocarbon determinations for MIS 3 bones from southern Ireland were significantly too young, by roughly 5,000 to 12,000 radiocarbon years. Castlepook is thus strong evidence for a Pleistocene faunal world, but weak evidence for reconstructing one simultaneous animal community or a particular year's hunt.

The Human Question at Castlepook

The most tantalising human question concerns a reindeer femur from Castlepook. A deep mark on the bone has been interpreted by zoologist Ruth Carden as an incision made by a sharp stone tool during carcass processing. County Cork heritage material presents the object as Palaeolithic and approximately 31,000 BC, and suggests that the animal may have been butchered outside the cave before remains were scavenged or carried inside by carnivores. If that interpretation is correct, it would indicate a human visit to Ireland far earlier than the securely evidenced late-glacial and early-Holocene occupations usually discussed in Irish prehistory.

It must remain an interpretation rather than a foundation myth. No stone tool securely associated with the femur has been recovered; nor is there a hearth, dwelling surface, burial, human bone, art assemblage or repeated processing area of comparable age in Ireland. The marked bone cannot tell us whether people killed the reindeer, found a carcass, removed meat, hide or sinew, or stayed for hours rather than days. It may signal a brief Upper Palaeolithic encounter, but it does not establish a settled population, a named culture or continuous habitation.

What Cannot Be Written

Accordingly, political affairs, diplomacy and organised warfare cannot responsibly be described for Ireland at this date. There were no states, kingdoms, documented territories or identifiable leaders. Nor is there evidence for an Irish religion, language, artistic tradition, trade system or formal learning. Even everyday human life is unknown, because a human presence at this depth of time is presently represented by a disputedly interpreted mark rather than a settlement. The absence of such evidence should not be confused with proof that nobody ever crossed the landscape; it defines the limit of what the surviving record can show.

If people did reach Ireland during this phase, the wider European comparison suggests small, mobile hunter-gatherer groups able to exploit seasonal animal and plant resources. But that is an inference from the Upper Palaeolithic world beyond Ireland, not a demonstrated social description of people at Derrynree

or Doneraile. Reindeer and other mammals may have moved through open country in seasonal patterns, but Irish evidence does not reconstruct their routes, herd sizes or human hunting strategies. Trade, seafaring and enduring exchange networks are likewise unproven.

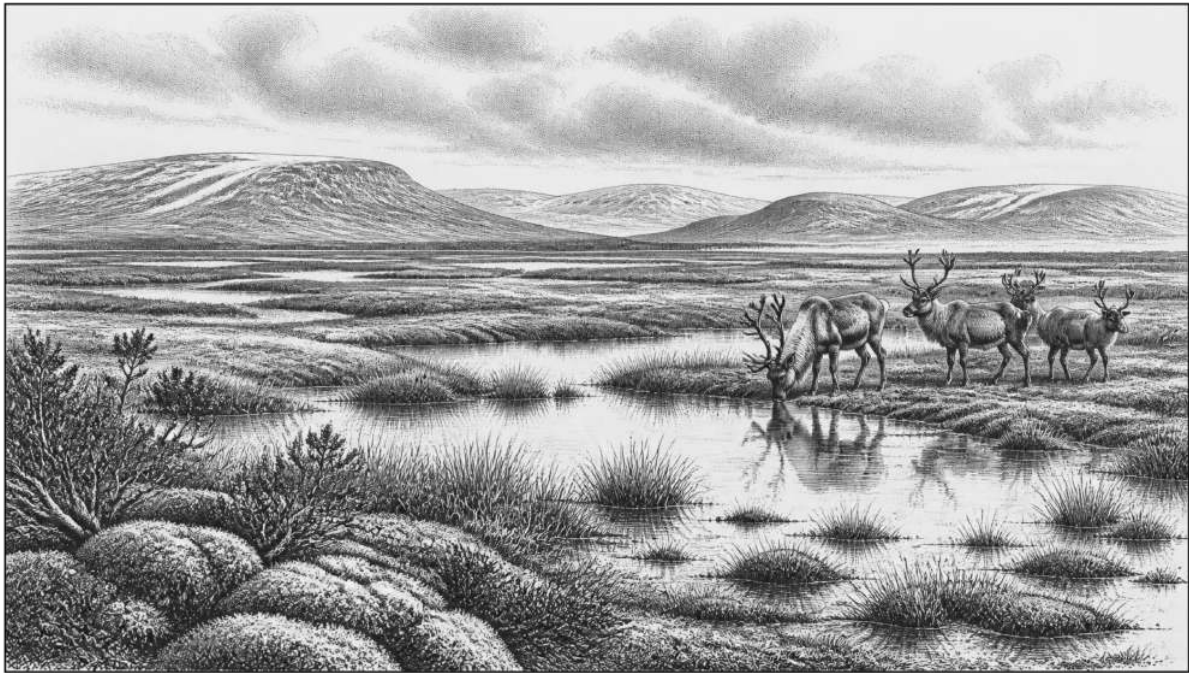
A Fragile Window

The central historical development near this notional date was environmental: an unstable cold-phase Ireland still capable, in some districts, of sustaining freshwater wetlands, tundra vegetation and substantial animal life before later ice expansion transformed the island. Derryvree's value lies in that narrow window between tills. It shows that Ireland's Ice Age history was neither a simple tale of permanent ice nor a settled human past awaiting names and events. Around 31,603 BCE, the evidence permits a careful picture of water, frost, open ground, animals and changing ice margins—and requires intellectual restraint about almost everything else.

Chapter 099 of 100

31602 BCE

Derryvree's Sedge-Moss Interval^[99]



The label 31,602 BCE is a modern chronological convenience, not a date that can be matched to a recorded event in prehistoric Ireland. No calendar, settlement sequence or archaeological layer permits historians to distinguish this single year from those immediately before or after it. In radiocarbon practice, “present” is conventionally AD 1950, and samples of this antiquity require calibration because atmospheric radiocarbon levels have varied over time. The responsible frame is therefore a broad calibrated interval, not an annual narrative. Around this notional date, Ireland belonged to the later part of Marine Isotope Stage 3, an unstable phase of the last Ice Age preceding the fullest expansion of the British–Irish Ice Sheet.

A Date Within a Wider Interval

The most relevant Irish evidence comes from deposits rather than artefacts. At Derryvree, near Maguiresbridge in County Fermanagh, roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands trapped between two separate sheets of glacial till. Organic material from these sediments produced a radiocarbon determination of about 30,500 radiocarbon years before present, with a substantial error range. Published calibrations place the deposit broadly between about 36,900 and 31,700 calendar years before present. Converted approximately into BCE terms, that span extends from roughly 34,950 to 29,750 BCE.

Thus 31,602 BCE falls within the wide chronological horizon illuminated by Derryvree, but it cannot be identified as the exact year in which the deposit formed. The sediments accumulated over time beside freshwater, while the organic remains within them may derive from several seasons or generations of

vegetation. Their later burial beneath ice preserves a sequence of changing environments, not a dated episode in human history. This distinction is fundamental: the evidence supports a picture of cold-stage Ireland on a millennial scale, not a claim that a particular occurrence happened in this named year.

Freshwater Beneath the Ice

Derryvree is important because it records biologically active ground later overridden by glacier ice. Pollen, plant remains, mosses and insect evidence indicate an open, treeless landscape, with wet ground and freshwater pools among areas affected by severe frost. The original investigators described a vegetation unlike later Irish woodland: herbs, sedges and mosses were prominent, while dwarf shrubs and scattered low woody plants could exploit favourable niches. The term “muskeg”, used in discussion of the deposit, conveys the likely mixture of saturated, peaty vegetation and shallow water rather than a uniform bog of the modern Irish kind.

This was not an empty frozen waste. Even a cold, exposed landscape could contain productive margins around pools, seepages and watercourses. Sedges and other wetland plants supplied habitat for insects; insects in turn form part of food webs that could support birds and mammals. The local terrain would have varied. Low, waterlogged hollows, exposed mineral soils, river margins and sheltered slopes offered contrasting conditions within a relatively small area. Yet the Derryvree sequence should not be mistaken for a complete map of Ireland. It gives a sharply valuable local record from Fermanagh, not a survey of every coast, upland and interior plain.

Climate Before the Maximum Ice

At this time Ireland was in the last glacial period, but not yet at the Last Glacial Maximum. The main maximum of the British–Irish Ice Sheet occurred later, broadly between about 26,000 and 19,000 years ago, although the timing and extent of ice varied greatly between regions. Research on Irish landforms, marine sediments and ice-sheet modelling indicates a long, complex process of ice growth, advance and retreat. The broad Derryvree chronology is therefore especially useful: it demonstrates that ice-free freshwater environments existed in parts of north-central Ireland before a later advance laid down the upper till.

South-western Ireland supplies complementary evidence. Uranium-thorium dating of calcite formations in Crag Cave, County Kerry, shows that speleothems formed intermittently during Marine Isotope Stage 3. Because calcite deposition in such a shallow cave requires liquid water moving through the rock, these episodes point to intervals of relative climatic amelioration. They do not mean that Ireland was warm in any modern sense. Rather, the last Ice Age was punctuated by abrupt shifts, with conditions that could change markedly over centuries and millennia. A scene fixed permanently as either a wholly ice-covered island or a stable grassland would be misleading.

Animals and Open Country

Animal remains from Irish caves give a second, necessarily fragmentary perspective. Castlepook Cave near Doneraile in north County Cork has yielded one of the island’s richest Late Pleistocene faunal collections. Reassessment and improved radiocarbon pretreatment have shown that some remains once assigned younger dates are substantially older, belonging to Marine Isotope Stage 3. The wider

assemblage includes evidence for animals associated at different times with open, cold-stage environments: reindeer, giant deer, woolly mammoth, brown bear, wolf, fox, hare, lemmings and spotted hyaena.

The list must be handled with care. A cave accumulation is not a census of a single landscape at a single moment. Caves can be dens, traps, drainage channels and places where bones are carried by carnivores, water or people. Many Castlepook materials were recovered during antiquarian excavations, before modern recording standards, and some deposits had been disturbed. Nor should every species be placed together in one imagined herd: redating indicates that the fauna represents more than one episode, while giant deer and spotted hyaena may have disappeared locally well before the later glacial maximum. What the cave securely demonstrates is that large mammals repeatedly reached Ireland during the Late Pleistocene and that the island formed part of a wider north-west European ecological world.

The Castlepook Human Question

A reindeer femur from Castlepook has made this broad period especially significant for Irish archaeology. County Cork heritage material identifies it as dating to about 31,000 BCE and records a deep mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool while a fresh carcass was processed. If that interpretation is upheld, the bone represents possible evidence for Upper Palaeolithic people handling reindeer in Ireland far earlier than the long-established evidence for terminal Pleistocene and Mesolithic occupation.

Its importance does not remove its limits. The radiocarbon result dates the animal's death, not automatically the cutting action, the place where the animal was killed, or the duration of a human visit. Identifying a surface alteration as a tool mark is a separate taphonomic judgement, requiring comparison with carnivore damage, sediment abrasion, breakage and excavation disturbance. Most importantly, there is no securely associated stone-tool assemblage, hearth, dwelling floor, burial, human bone or repeated occupation surface from Ireland of this age. The marked femur may support the possibility of a brief hunter-gatherer incursion; it cannot demonstrate a permanent settlement, a continuous population or a named community.

No Kingdoms, No Recorded Society

There is no evidence from Ireland around this horizon for political institutions, rulers, diplomacy, warfare, tribal names, law or territorial boundaries. Nor is there Irish evidence for farming, herding, pottery, metalworking, monuments, writing, formal learning, long-distance trade in recognisable goods, or organised religious ceremony. It would be equally unsound to attach a later ethnic label, language or national identity to any possible visitors. "Irish" here describes the geographical subject of enquiry, not an ancient people known by that name.

If people did enter the island, the modest inference is that they were highly mobile hunter-gatherers able to use portable stone cutting tools and to exploit animal resources. Reindeer, if present in suitable numbers, could have supplied meat, hides, sinew, bone and antler. But even this describes a possibility suggested by a single object and wider European comparison, rather than a documented Irish economy. No evidence identifies whether visitors hunted an animal, scavenged it, processed it elsewhere before the bone entered the cave, or remained in the region beyond a short stay.

A Landscape of Evidence

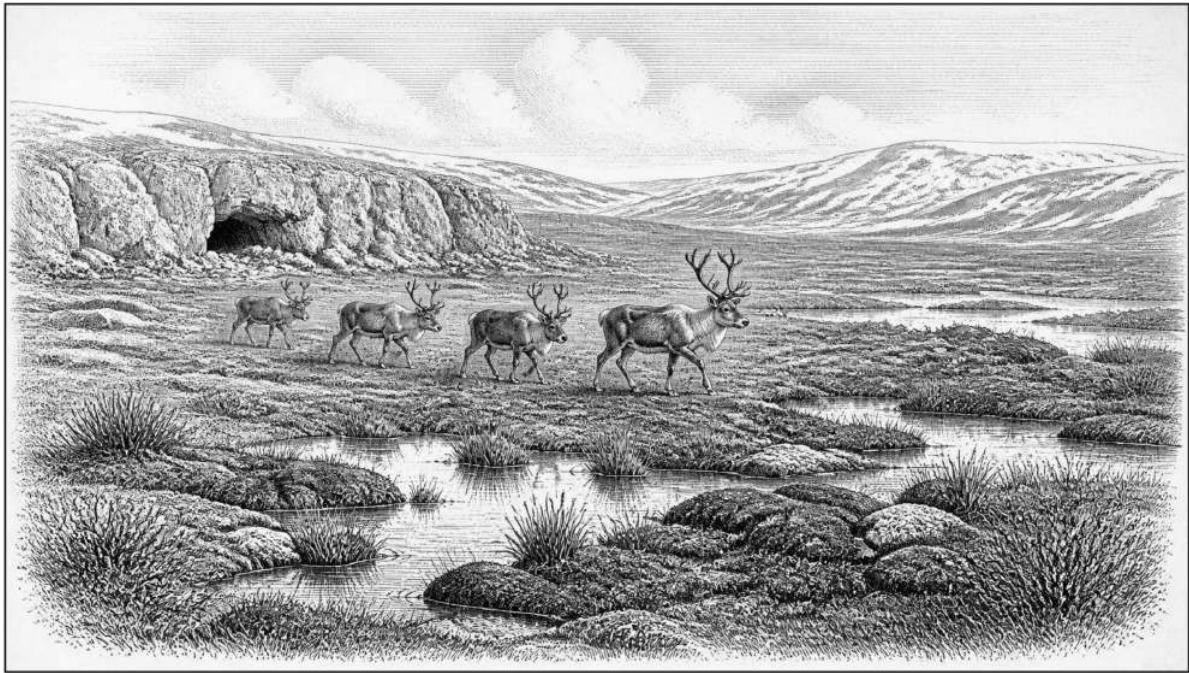
The historical importance of this horizon lies in its restraint. Derryvree's buried freshwater deposits show that parts of Ireland held open, wet and ecologically active terrain during a fluctuating Ice Age interval. Crag Cave registers episodes when groundwater moved and calcite grew. Castlepook demonstrates the presence, across different episodes, of a varied Pleistocene fauna and preserves a tantalising but still limited indication of human activity. Together they replace the old image of an unchanging, wholly ice-bound Ireland with one of regional variation, environmental change and fragile survival in the archaeological record.

For 31,602 BCE, then, the most responsible account is not of an event but of a changing country. Its waters, sedges, mosses, animals and advancing ice are better attested than its people. The silence concerning settlements and social life is not a gap to be filled with invention; it is itself the defining fact of Ireland at this depth of time.

Chapter 100 of 100

31601 BCE

Castlepook's Unresolved Reindeer^[100]



The label 31,601 BCE is a modern chronological convenience, not a year that anybody in Ireland could have named, recorded or commemorated. At this depth of time, calendar-year precision is unavailable. The date converts approximately to 33,550 years before AD 1950, placing it in the later part of Marine Isotope Stage 3, within the Last Glacial period. Ireland's evidence is exceptionally fragmentary: buried wetland sediments in Fermanagh, cave deposits in Cork and Kerry, animal bones, pollen, insects, spores, calcite and the landforms left by ice. These sources can illuminate a broad environmental interval, but they cannot supply an event-by-event history.

This was not yet the Last Glacial Maximum, when the Irish Ice Sheet expanded to cover the island and much of its surrounding shelf. Instead, 31,601 BCE belongs to a long, unstable pre-maximum phase in which cold climates were repeatedly interrupted by less severe interstadial episodes. Greenland ice cores record abrupt shifts on the scale of decades and centuries. One such warming, Greenland Interstadial 6, began at about 33,740 years before AD 2000, with a stated chronological uncertainty. That places this modern calendar label broadly near its beginning. Yet it would be unsafe to declare that a particular Irish valley experienced precisely the same climatic turn in this exact year: correlations between Greenland, Irish caves and Irish sedimentary sequences remain matters of chronological comparison, not annual synchronisation.

A Country Not Yet Under Its Maximum Ice

Recent reconstructions of the British–Irish Ice Sheet have altered the older image of an Ireland continuously smothered by ice throughout the last cold stage. The best available evidence indicates that the bulk of the last Irish Ice Sheet grew from more limited, initially ice-free conditions around 34,000 years ago, then expanded greatly over the following millennia. Its maximum extent came much later,

broadly around 27,000–23,000 calibrated years before present. Therefore, around 31,601 BCE some parts of Ireland could support plants, animals and perhaps occasional human visitors, even as glaciers and periglacial conditions shaped other regions.

This was nevertheless a severe world. ‘Ice-free’ did not mean mild, wooded or agriculturally productive in any modern sense. Long winters, frozen ground, sparse vegetation, strong winds and short growing seasons would have governed the landscape. The position of the sea is also difficult to translate into a simple map. Global sea level was lower than today, but Ireland’s coasts, ice margins, local land movement and marine passages were changing. It is not responsible to assume either a permanent dry land bridge to Britain or easy sea crossings at this date. The routes by which animals, and any people, reached Ireland remain unresolved.

Political affairs, diplomacy and organised warfare cannot be recovered for Ireland at this time. There are no settlements, graves, monuments, weapons caches, written records or enduring territorial boundaries from which such matters might be inferred. The appropriate historical subject is instead a changing environment at Europe’s north-western margin, where ecological opportunity could be brief and local.

Derryvree’s Wet, Treeless Ground

The clearest Irish terrestrial evidence relevant to this broad period comes from Derryvree, near Maguiresbridge in County Fermanagh. There, organic-rich silts lie between two layers of glacial till. The lower till shows that ice had previously crossed the locality; the overlying deposits record a time when water, vegetation and invertebrate life returned; the upper deposits testify to later glacial advance. This sequence is invaluable precisely because it records change rather than a timeless ‘Ice Age’ landscape.

A conventional radiocarbon measurement from the Derryvree organic sediments was reported as $30,500 \pm 1,100$ radiocarbon years BP. Later discussion has expressed the broad calibrated range as roughly 36,900–31,700 calendar years BP. That wide interval encompasses 31,601 BCE approximately, but it does not date an individual season or community. The sample was organic material from a deposit, not a diary entry; its uncertainty is a central part of the evidence.

The biological remains suggest open tundra or muskeg: wet, mossy, sedge-rich ground, shallow pools and channels, grasses, herbs and low shrubs rather than closed forest. Fossil evidence includes bogbean and alpine clubmoss, species capable of living in cold, waterlogged settings. Insect evidence likewise indicates wet ground rich in decaying plant matter and open water. Pollen is less decisive than a simple list of species might imply, because grains can travel long distances, be redeposited or survive unevenly. Still, the combined plant, spore and insect record strongly supports a cold, treeless local environment.

Derryvree should not be imagined as a featureless snow desert. In the brief productive season, pools supported aquatic plants, mosses held wet soil together and sedges provided food and cover for small animals. Such places were patchy. A low basin with standing water could be biologically active while nearby exposed ground was wind-scoured, frozen or sparsely vegetated. This mosaic was the setting through which larger animals could move.

Castlepook and the Animal World

In north County Cork, Castlepook Cave near Doneraile preserves a very different kind of archive. Excavations and collecting, especially those associated with Richard J. Ussher in the early twentieth century, recovered a rich Pleistocene fauna. Subsequent re-examination and improved radiocarbon pretreatment have shown that parts of the assemblage are substantially older than earlier dates suggested.

Mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are among the animals represented. They demonstrate that Ireland formed part of a wider north-west European cold-stage ecological world, not an isolated void.

The species did not necessarily coexist in one herd-filled valley on one day. Cave deposits often accumulate over long periods, and caves can act as dens, traps, shelters, drainage conduits and collectors of material carried in by carnivores. Each radiocarbon date applies to a particular bone, not automatically to every specimen beside it. The fauna nevertheless supports the interpretation of an open landscape capable of sustaining grazing and browsing herbivores, their predators and scavengers.

Reindeer are especially important because a Castlepook hind-limb femur has been reported as approximately 33,000 years old and as bearing a deep mark consistent with cutting or chopping by a sharp stone tool. If the interpretation of that modification is confirmed, it is the most direct indication that a person handled animal tissue in Ireland during the Upper Palaeolithic, far earlier than the long-established evidence for post-glacial settlement. It would be a remarkable discovery.

But its limits must be kept in view. The bone comes from an old collection, not a modern excavation of a sealed occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, human burial, repeated butchery area or stratified camp has been published for this episode. The date concerns the animal's death, while identifying a mark as a human tool-cut is a separate specialist judgement. The femur may therefore indicate a brief visit or an episode of carcass processing; it cannot establish a permanent population, a named archaeological culture, a migration route or descent into later Irish communities.

People: Possibility Rather Than Population

Across Europe, *Homo sapiens* communities of this age made sophisticated stone tools, wore tailored clothing in some regions, hunted and scavenged large animals, and maintained social connections over considerable distances. Some groups produced ornaments, figurative objects and cave art. Those facts provide a comparative context, but they are not direct evidence that such practices occurred in Ireland. No Irish artwork, personal ornament, tool industry or built shelter securely dated to around 31,601 BCE has been recovered.

If people reached the Irish landscape during a milder window, they were probably few and mobile. A reindeer carcass could have supplied meat, fat, marrow, hide, sinew and bone, but this is an inference from hunter-gatherer practice elsewhere, not a documented Irish meal. The same caution applies to social life. Small travelling groups would have required knowledge of terrain, weather, animal movements and safe refuges, yet the Irish record cannot reveal their language, kinship, beliefs, ritual practices or political relationships.

Religion, culture and learning consequently leave no direct trace here. Caves should not automatically be treated as sacred places merely because they are caves, nor should animal bones be made into evidence of ritual. Castlepook is first an environmental and palaeontological archive. Its possible humanly modified reindeer femur is historically important because it raises a question, not because it supplies a ready-made story of Ice Age Irish identity.

A Precarious Threshold

There was no farming, no domestic livestock, no fields, no trade network that can be demonstrated within Ireland, and no permanent village known from this date. Economy, if people were present at all, was founded on the immediate possibilities of a cold wild landscape: moving animals, usable stone, fuel, shelter and seasonal water. The later expansion of the Irish Ice Sheet would have repeatedly erased or buried many traces, while lower sea levels mean that potential coastal landscapes now lie beneath water or have been reworked by later marine processes.

That loss helps explain why the evidence is so uneven. Derryvree preserves a wetland interval; Castlepook preserves bones; Crag Cave in County Kerry preserves episodes of calcite growth that show liquid water could periodically circulate underground in south-west Ireland before the maximum glaciation. Together they show a country of shifting habitable pockets rather than a stable homeland. Around 31,601 BCE, Ireland's story is not one of kings, tribes or borders. It is the story of cold ground, shallow water, grazing animals and a tantalising but unresolved possibility that people briefly stood among them.



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 Freshwater Beds (31700 BCE). Sources: References 1, 17, 30, 34, 36, 62, 79, 117, 164, 179, 186, 217, 238, 256, 308, 340, 382, 391, 395, 434.
2. Chapter 002 — Derryvree's Sedge Muskeg (31699 BCE). Sources: References 1, 30, 36, 62, 131, 154–155, 167, 187, 234, 254, 259, 271, 277, 279, 288, 363, 380, 382, 392, 405, 434.
3. Chapter 003 — Birm-166's Sedge Record (31698 BCE). Sources: References 1, 16, 36, 46, 78, 83, 103, 107, 116, 138, 154, 187, 218, 233, 248, 254, 357, 382, 392, 434.
4. Chapter 004 — Denekamp Over Doneraile (31697 BCE). Sources: References 37, 62, 84, 104, 108, 167, 219, 248, 254, 271, 297, 303, 325–326, 338, 349, 383, 393, 419, 426.
5. Chapter 005 — Derryvree's Cold-Stage Wetland (31696 BCE). Sources: References 17, 29, 32, 34, 38, 59, 62, 75, 81, 154, 177, 179, 185, 199, 219, 254, 271, 277, 342, 384, 426, 435.
6. Chapter 006 — North Cork Reindeer Limb (31695 BCE). Sources: References 1, 7, 12, 34, 37, 67, 97, 131–132, 167, 186, 216, 242, 254, 281, 381–382, 391, 421, 435.
7. Chapter 007 — Castlepook's Incised Femur (31694 BCE). Sources: References 1, 34, 37, 62, 103, 109, 123, 125, 156, 167, 178, 197, 220, 238, 248, 254, 271, 338, 342, 383, 391, 419, 427.
8. Chapter 008 — Derryvree's Arctic Mosses (31693 BCE). Sources: References 16, 23, 35–36, 59, 94, 131, 154, 157, 167, 187–188, 199, 227, 238, 256–257, 271, 281, 382, 385, 391, 403.
9. Chapter 009 — Derryvree's Trifoliolate Seed (31692 BCE). Sources: References 1, 14, 16, 23, 36, 103, 114, 118, 131, 133, 138, 154, 167, 233, 239, 248, 254, 279, 287, 364, 367, 370, 382, 392.
10. Chapter 010 — The Castlepook Hindleg (31691 BCE). Sources: References 9, 17, 37, 85, 101, 131, 156, 167, 186, 233, 254, 271, 310, 318, 322, 340, 342, 350, 383, 391, 419, 426, 435–436.
11. Chapter 011 — The Birm-166 Horizon (31690 BCE). Sources: References 1, 16, 62, 68, 104, 109, 131, 139, 154, 167, 179, 192, 248, 259, 271, 288, 297, 299, 340, 357, 384, 391, 434.
12. Chapter 012 — Castlepook's Hyaena Accumulation (31689 BCE). Sources: References 1, 10, 38, 51, 98, 108, 113, 131, 134, 167, 179, 233, 238, 254, 288, 295, 300, 343, 381, 383, 391, 409.
13. Chapter 013 — Hyaena Hall's Bone Traffic (31688 BCE). Sources: References 1–2, 36, 63, 75, 133, 154, 167, 179, 184, 233, 236, 243, 254, 265, 290, 296, 340, 357, 362, 381, 391, 406.
14. Chapter 014 — Fermanagh's Frost Mosses (31687 BCE). Sources: References 1, 16, 34–36, 52, 55, 62, 74, 132, 142, 158–159, 179, 189, 254, 259, 294, 346, 351, 368, 382, 392, 434.
15. Chapter 015 — Derryvree's Hidden Silt (31686 BCE). Sources: References 1, 16, 30, 33, 36, 47, 85, 131, 133, 254, 291, 311, 327, 332, 362, 392, 398, 409, 428, 434.
16. Chapter 016 — Derryvree's Greenland Six (31685 BCE). Sources: References 1, 30, 37, 59, 62, 69, 71, 85, 94, 131–132, 145, 154, 167, 217, 235, 254, 281, 291, 342, 370, 392, 435.
17. Chapter 017 — Derryvree's Marsh Ledger (31684 BCE). Sources: References 1, 14, 17, 38, 71, 83, 103, 131, 140, 156, 167, 179, 199, 218, 230, 238, 248, 256, 277, 411, 435.
18. Chapter 018 — Derryvree's Inter-Till Flora (31683 BCE). Sources: References 1, 16, 36, 62, 108, 131, 133, 154, 167, 199, 208, 254, 264, 271, 300, 313, 338, 340, 382, 392.
19. Chapter 019 — Derryvree's Frostwater Flora (31682 BCE). Sources: References 1, 6, 16, 36, 55, 103, 107, 116, 129, 131, 154, 167, 185, 190, 254, 271, 340, 382, 392, 414.
20. Chapter 020 — Derryvree's Tundra Waterline (31681 BCE). Sources: References 16, 36, 39, 62, 86, 110, 129, 132, 154, 172, 199, 204, 209, 221, 233, 254, 282, 304, 340, 382, 391–392, 434.

- 21.** Chapter 021 — Bogbean and Reindeer (31680 BCE). Sources: References 36, 39, 87, 104, 107, 131, 222, 248, 254, 271, 273, 281, 292, 301, 319, 322, 336, 383, 392, 410, 420, 434, 439.
- 22.** Chapter 022 — Fermanagh Between the Tills (31679 BCE). Sources: References 18, 84, 103, 131–132, 135, 154, 181, 186, 220, 233, 250, 271, 288, 290, 340–341, 357, 362, 369, 382, 393, 409, 427.
- 23.** Chapter 023 — The Maguiresbridge Freshwater Series (31678 BCE). Sources: References 17, 34, 37, 59–60, 94, 132, 154, 167, 248, 254, 274, 277, 291, 313, 340, 382, 393, 422, 435.
- 24.** Chapter 024 — The Castlepook Carcass (31677 BCE). Sources: References 1, 30–31, 37, 79, 83, 127, 132, 135, 155, 167, 210, 256, 281, 340, 342, 381, 383, 394, 415, 419.
- 25.** Chapter 025 — Mammoth Cave’s Cold Corridor (31676 BCE). Sources: References 1, 13, 16, 30, 34, 36, 54, 131, 154, 167, 171, 248, 254, 259, 288, 290, 333, 340, 393, 396, 414, 434.
- 26.** Chapter 026 — The Irish Sea Threshold (31675 BCE). Sources: References 1, 30, 34, 38, 71, 81, 127, 154, 167, 179, 186, 244, 254, 259, 308, 323, 342, 382, 393, 415, 419, 435.
- 27.** Chapter 027 — Cork’s Mammoth-Steppe Mosaic (31674 BCE). Sources: References 1, 15, 37, 62, 84, 131, 133, 135, 167, 189, 233, 238, 254, 259, 270–271, 288, 320, 349, 382, 393, 435.
- 28.** Chapter 028 — The Maguiresbridge Freshwater Lens (31673 BCE). Sources: References 1, 16, 30, 36, 62, 154, 169, 199, 217, 254, 258, 271, 277, 293, 327, 340, 352, 373, 382, 393, 434.
- 29.** Chapter 029 — Castlepook’s Reindeer Incision (31672 BCE). Sources: References 1, 22, 25, 85, 97, 102, 131, 133, 145, 158, 167, 185, 254, 267, 288, 298, 308, 322, 326, 340, 352, 393, 407, 418.
- 30.** Chapter 030 — Derryvree’s Denekamp Wetland (31671 BCE). Sources: References 56, 59, 84, 131, 167, 181, 199, 211, 218, 233, 250, 254, 259, 271, 288, 313, 362, 383, 391, 393, 417, 435.
- 31.** Chapter 031 — Derryvree’s Silted Pool (31670 BCE). Sources: References 14, 16, 22, 36, 39, 107, 131, 133, 154, 192, 231, 233, 239, 254, 259, 279, 288, 298, 306, 372, 382, 393, 401, 434.
- 32.** Chapter 032 — Sedges Beneath Fermanagh (31669 BCE). Sources: References 1, 16, 30, 36, 62, 85, 131, 133, 155, 187, 240, 243, 251, 254, 259, 271, 277, 309, 340, 353, 382, 390, 392, 434.
- 33.** Chapter 033 — A Reindeer Femur at Castlepook (31668 BCE). Sources: References 30, 34, 82, 85, 94, 126, 131, 154, 164, 167, 185, 187, 210, 233, 254, 277, 289, 322, 324, 341–342, 392, 414.
- 34.** Chapter 034 — The Maguiresbridge Interstadial (31667 BCE). Sources: References 1, 14, 16, 26, 37, 112, 131, 134, 144, 154, 167, 204, 248, 254, 271, 281, 289, 330, 349, 392, 395, 414, 435.
- 35.** Chapter 035 — Greenagho’s Buried Lake (31666 BCE). Sources: References 34, 38, 94, 97, 122, 132, 155, 160, 167, 176, 179, 185, 238, 254, 259, 275, 288, 391, 393, 409.
- 36.** Chapter 036 — Castlepook’s Reindeer Mark (31665 BCE). Sources: References 1, 6, 34, 37, 72, 128, 135, 157, 167, 186, 212, 218, 233, 254, 271, 291, 342, 347, 392, 419.
- 37.** Chapter 037 — Hyaena Land’s Faunal Network (31664 BCE). Sources: References 1, 17, 36, 79, 85, 107, 133, 145, 158, 167, 205, 233, 256, 281, 332, 346, 357, 392, 396, 434.
- 38.** Chapter 038 — Maguiresbridge Bogbean Pool (31663 BCE). Sources: References 17, 26, 34, 36, 54, 59–60, 62, 85, 94, 103, 109, 154, 199, 232, 248, 271, 327, 340, 369, 382, 395, 415.
- 39.** Chapter 039 — The Derryvree Seedbed (31662 BCE). Sources: References 1, 29, 37, 58–62, 77, 94, 108, 132, 143, 149, 167, 218, 233, 256, 258, 271, 305, 427.
- 40.** Chapter 040 — Derryvree’s Arctic Sandwort (31661 BCE). Sources: References 16, 36, 53, 62, 95, 107, 141, 154, 167, 200, 207, 253–254, 271, 285, 301, 339, 392, 409, 420.
- 41.** Chapter 041 — Derryvree’s Permafrost Garden (31660 BCE). Sources: References 3, 37, 54, 79, 154, 167, 186, 220, 226, 238, 254, 259, 263, 266, 271, 322, 340, 342, 349, 393, 416, 435.

- 42.** Chapter 042 — Birm-166's Tundra Basin (31659 BCE). Sources: References 1, 17, 30, 36, 59, 79, 84, 94, 154, 161, 164, 167, 185, 199, 219, 289, 312, 382, 386, 393, 395, 415, 427, 434.
- 43.** Chapter 043 — Castlepook's Cut Reindeer (31658 BCE). Sources: References 1, 62, 99, 135, 155, 165, 167, 170, 186, 218, 256, 259, 290, 315, 340, 342, 347, 354, 358, 391, 435.
- 44.** Chapter 044 — Maguirebridge's Trifoliate Pools (31657 BCE). Sources: References 1, 10, 16, 34, 36, 39, 64, 70, 136, 146, 157, 167, 218, 250, 254, 290, 298, 314, 334, 340, 357, 382, 392, 428.
- 45.** Chapter 045 — Castlepook's Waning Fauna (31656 BCE). Sources: References 1, 16, 37, 54, 59, 73, 84, 103, 132, 162, 190, 193, 204, 211, 218, 245, 248, 256, 282, 291, 333, 340, 358, 387, 393, 419, 435, 437.
- 46.** Chapter 046 — Doneraile's Reindeer Horizon (31655 BCE). Sources: References 1, 21, 34, 37, 62, 131–132, 150, 154, 167, 240, 254, 283, 288, 290, 296, 342, 382, 393, 416, 421.
- 47.** Chapter 047 — Mammoth Cave's Cold Menagerie (31654 BCE). Sources: References 37, 44, 49, 84, 97, 131, 167–168, 185, 238, 250, 254, 259, 271, 322, 340, 356, 393, 409, 419, 435.
- 48.** Chapter 048 — Derryvree Before the Drumlin (31653 BCE). Sources: References 1, 11, 16, 39, 55, 107, 129, 131, 133, 154, 187, 201, 243, 281, 332, 346, 382, 392, 401, 434.
- 49.** Chapter 049 — Crag Cave's Thaw Windows (31652 BCE). Sources: References 17, 23, 30, 36, 40, 107, 109, 131, 185, 187, 209, 223, 241, 280, 313–314, 322, 369, 382, 392, 426, 428.
- 50.** Chapter 050 — Mammoth Cave, Derryvree, and Ice (31651 BCE). Sources: References 8, 22, 26, 28, 99, 112, 131, 155, 167, 193, 208, 211, 233, 254, 298, 308, 322, 393, 409, 416, 427, 435.
- 51.** Chapter 051 — Castlepook's Marked Femur (31650 BCE). Sources: References 1, 37, 41, 54, 59–60, 122, 131, 145, 156, 167, 179, 190, 220, 256, 259, 271, 298, 342, 349, 361, 366, 382, 391.
- 52.** Chapter 052 — Fermanagh's Birm-166 Deposit (31649 BCE). Sources: References 16, 24, 26, 37, 79, 103, 132, 154, 179, 219, 250, 254, 259, 340, 342, 349, 361, 375, 383, 393, 396, 416, 427.
- 53.** Chapter 053 — The Awbeg Cutmark Debate (31648 BCE). Sources: References 1, 16, 30, 36, 50, 55, 62, 103, 105, 111, 118, 148, 154, 166, 185, 240, 254, 260, 268, 340, 382, 392, 412, 420.
- 54.** Chapter 054 — Hyenahall's Mammoth Archive (31647 BCE). Sources: References 16, 36, 62, 79, 85, 103, 137, 155, 204, 209, 217, 248, 254, 259, 283, 308, 362, 369, 392, 397, 434.
- 55.** Chapter 055 — Castlepook's Single Cut (31646 BCE). Sources: References 36, 77, 88, 167, 213, 233, 254, 259, 263, 291, 294, 298, 317, 321, 340, 345, 355, 382, 392, 396, 434, 438.
- 56.** Chapter 056 — Castlepook's Carnivore Galleries (31645 BCE). Sources: References 17, 37, 62, 79, 84, 94, 100, 128, 131–132, 155, 163, 167, 179, 219, 254, 266, 271, 291, 326, 340, 383, 394, 409, 416.
- 57.** Chapter 057 — Maguirebridge's Calibrated Tundra (31644 BCE). Sources: References 1, 16, 26, 37, 109, 131–132, 164, 167, 183, 203, 219, 250, 256, 271, 278, 281, 341, 382, 391, 402, 435.
- 58.** Chapter 058 — Derryvree's Bogbean Waters (31643 BCE). Sources: References 16, 36, 39, 71, 77, 85, 104, 126, 154, 167, 254, 277, 289, 317, 322, 340, 344, 348, 374, 382, 392, 420.
- 59.** Chapter 059 — The Castlepook Femur Problem (31642 BCE). Sources: References 1, 36, 45, 62, 85, 95, 133, 154, 167–168, 194, 217, 240, 250, 254, 265, 269, 277, 292, 382, 393, 409.
- 60.** Chapter 060 — Mammoths Before the Advance (31641 BCE). Sources: References 17, 37, 62, 114, 163, 186, 196–197, 204, 238, 254, 288, 306, 312, 335, 378, 393, 404, 409, 435.
- 61.** Chapter 061 — Sedges Beneath a Fermanagh Drumlin (31640 BCE). Sources: References 17, 26, 38, 48, 84, 103, 115, 154, 186, 202, 208, 229, 254, 271, 288, 322, 340, 358, 392, 409, 426, 435.
- 62.** Chapter 062 — Derryvree's Sedgebound Interval (31639 BCE). Sources: References 17, 62, 99, 104, 131–132, 167, 186, 219, 238, 250, 271, 283, 286, 322, 340, 344, 392, 423, 435.

- 63.** Chapter 063 — Castlepook’s Open Corridor (31638 BCE). Sources: References 17, 22, 30, 36, 103, 109, 135, 154, 193, 238, 248, 271, 291, 298, 340, 391, 408–409, 429, 435–436.
- 64.** Chapter 064 — Awbeg’s Reindeer Crossing (31637 BCE). Sources: References 17–18, 34, 63, 94, 131, 152, 167, 195, 199, 254, 256, 289, 295, 354, 369, 390–392, 409.
- 65.** Chapter 065 — Castlepook’s Earliest Question (31636 BCE). Sources: References 1, 16, 34, 36, 54, 107, 131, 133, 154, 167, 217, 240, 248, 254, 339, 382, 392, 395, 420, 434.
- 66.** Chapter 066 — The Doneraile Cutmark (31635 BCE). Sources: References 1, 37, 39, 79, 89, 131, 156, 167, 209, 224, 254, 265, 271, 277, 296, 374, 376, 382, 392, 414, 435.
- 67.** Chapter 067 — Fermanagh’s Inter-Till World (31634 BCE). Sources: References 1, 16, 34, 36, 62–63, 85, 107, 116, 131, 167, 185, 246, 254, 271, 308, 333, 342, 392, 434.
- 68.** Chapter 068 — Beneath Maguiresbridge Drumlin (31633 BCE). Sources: References 1, 14, 19, 26, 34, 36, 59, 61–62, 85, 94, 96, 103, 131, 138, 154, 167, 209, 240, 306, 365, 382, 391, 425.
- 69.** Chapter 069 — Castlepook’s Stadial Fauna (31632 BCE). Sources: References 20, 36, 39, 62, 131, 154, 209, 271, 291, 298, 309, 327, 340, 382, 393, 395, 409, 420, 427, 434.
- 70.** Chapter 070 — Rangifer at Doneraile (31631 BCE). Sources: References 4, 16, 37, 62, 133, 186, 206, 217, 254, 258, 265, 271, 327, 359, 379, 382, 395, 401, 430, 435.
- 71.** Chapter 071 — Castlepook’s Cave Fauna (31630 BCE). Sources: References 17, 37, 45, 77, 79, 84, 131–132, 211, 254, 271, 276, 291, 347, 387, 391, 395, 409, 416, 435.
- 72.** Chapter 072 — Awbeg’s Hyena Bonehouse (31629 BCE). Sources: References 1, 18, 27, 39, 56, 62, 154, 204, 228, 233, 238, 248, 254, 266, 309, 313, 340, 357, 377, 382, 393, 435.
- 73.** Chapter 073 — Maguirebridge’s Muskeg Pools (31628 BCE). Sources: References 1, 16, 30, 34, 62–63, 79, 82, 99, 131, 151, 179, 199, 259, 288, 308, 382, 393, 416, 434.
- 74.** Chapter 074 — Derryvree’s Buried Marsh (31627 BCE). Sources: References 12, 30, 62, 131, 134, 156, 167, 189, 199, 238, 254, 256, 259, 271, 281, 322, 328, 333, 349, 358, 393, 416, 426.
- 75.** Chapter 075 — The Reindeer Limb at Doneraile (31626 BCE). Sources: References 16, 34, 36, 54–55, 62, 79, 90, 94, 126, 154, 165, 170, 185, 197, 254, 271, 288, 290, 392, 414, 420.
- 76.** Chapter 076 — Sedges and Reindeer (31625 BCE). Sources: References 16, 34, 36, 76, 103, 131–132, 157, 167, 179, 185, 193, 237, 240, 247, 249, 257, 307–308, 382, 391, 428, 434.
- 77.** Chapter 077 — Maguiresbridge and Castlepook (31624 BCE). Sources: References 16, 38, 81, 101, 104, 131, 147, 158, 167, 175, 199, 210, 248, 256, 261, 272, 290, 302, 349, 382, 391, 395, 435.
- 78.** Chapter 078 — Birm-166’s Tundra Record (31623 BCE). Sources: References 1, 16, 36, 65, 78–79, 118, 136, 154, 167, 173, 187, 199, 217, 254, 332, 382, 391, 396, 414, 428, 434.
- 79.** Chapter 079 — BIRM-166 and Castlepook (31622 BCE). Sources: References 1, 37, 57, 103, 109, 131, 154, 167, 191, 198, 204, 217, 240, 248, 254, 262, 338, 357, 392, 435.
- 80.** Chapter 080 — Doneraile’s Reindeer Butchery (31621 BCE). Sources: References 1, 16, 34, 38, 59, 62, 109, 131, 155, 164, 167, 186, 255, 271, 277, 291, 333, 342, 349, 391, 424, 435.
- 81.** Chapter 081 — The Derryvree Drumlin Section (31620 BCE). Sources: References 1, 6, 16, 34, 36, 54, 80, 107, 119, 131, 157, 167, 220, 233, 254, 259, 308, 382, 393, 416, 435.
- 82.** Chapter 082 — Castlepook’s Open Hinterland (31619 BCE). Sources: References 1, 16, 37, 59, 62, 84, 94, 99, 131, 167, 211, 238, 254, 306, 308, 340, 360, 391, 427, 435.
- 83.** Chapter 083 — Derryvree’s Alpine Clubmoss (31618 BCE). Sources: References 1, 16, 34, 38, 56, 60–62, 104, 120, 127, 167, 217, 248, 254, 337, 392, 419, 427, 435.

- 84.** Chapter 084 — Birm-166 at Derryvree (31617 BCE). Sources: References 1, 16, 36, 107, 109, 133, 135, 153–154, 167, 203, 205, 217, 220, 254, 271, 382, 392, 420, 428, 431.
- 85.** Chapter 085 — Stone Mark in the Awbeg (31616 BCE). Sources: References 1, 35, 38, 41, 62–63, 131, 135, 150, 154, 167, 185, 220, 233, 254, 259, 271, 277, 342, 383, 393, 396, 409.
- 86.** Chapter 086 — Derryvree’s Organic Silts (31615 BCE). Sources: References 1, 17, 37, 41, 73, 97, 109, 120, 135, 167, 179, 205, 250, 254, 259, 284, 288, 292, 385, 393, 433, 435.
- 87.** Chapter 087 — Derryvree’s Treeless Fen (31614 BCE). Sources: References 1, 17, 37, 59, 103, 106, 116, 124, 131, 199, 211, 233, 254, 281, 288, 291, 308, 313, 349, 393, 409, 426.
- 88.** Chapter 088 — Maguirebridge’s Moss Basin (31613 BCE). Sources: References 1, 16, 30, 36, 54, 91, 107, 131, 133, 154, 167, 185, 199, 254, 301, 306, 371, 382, 391, 396, 409, 414.
- 89.** Chapter 089 — Derryvree’s Inter-Till Fen (31612 BCE). Sources: References 16, 36, 39, 62, 80, 107, 121, 130–132, 163, 171, 201, 254, 288, 340, 382, 392, 409, 434.
- 90.** Chapter 090 — The Derryvree Freshwater Series (31611 BCE). Sources: References 16, 36, 55, 59–61, 91, 94, 103, 107, 129, 131, 167, 214, 217, 248, 271, 337, 382, 392, 427.
- 91.** Chapter 091 — Maguirebridge’s Frostbound Waters (31610 BCE). Sources: References 1, 16, 30, 36, 82, 85, 103, 118, 126, 132, 162, 167, 199, 240, 248, 257, 271, 277, 340, 382, 392, 434.
- 92.** Chapter 092 — Maguirebridge’s Fossil Clock (31609 BCE). Sources: References 1, 16, 59, 61, 84, 94, 116, 129, 131, 154, 167, 180, 254, 259, 271, 277, 308, 316–317, 326, 340, 382, 393, 416, 420, 434.
- 93.** Chapter 093 — Castlepook’s Mammoth-Steppe (31608 BCE). Sources: References 1, 16, 36, 42, 62, 79, 82, 85, 154, 168, 209, 240, 252, 259, 271, 277, 340, 366, 382, 392, 397, 420.
- 94.** Chapter 094 — Birm-166’s Freshwater World (31607 BCE). Sources: References 16, 30, 35–36, 59–60, 62, 92, 94, 118, 131, 133, 154, 167, 182, 199, 254, 271, 279, 352, 392, 396, 417, 420, 434.
- 95.** Chapter 095 — Calcite, Tundra, and Castlepook (31606 BCE). Sources: References 1, 30, 38, 59–60, 108, 112, 131–132, 163, 192, 238, 254, 271, 278, 283, 338, 387–388, 393.
- 96.** Chapter 096 — Mammoth Cave’s Unsettled Signal (31605 BCE). Sources: References 1, 13, 30, 36, 126, 131, 154, 216–217, 254, 271, 291, 301, 340, 357, 382, 389, 392, 428, 434.
- 97.** Chapter 097 — Derryvree’s Interstadial Basin (31604 BCE). Sources: References 1, 4, 17, 30, 36, 59, 85, 94, 103, 135, 155, 167, 174, 225, 233, 254, 271, 329, 382, 392, 399, 427, 432, 434.
- 98.** Chapter 098 — Birm-166’s Freshwater Window (31603 BCE). Sources: References 14, 16, 36, 50, 107, 131, 138, 155, 167, 179, 217, 248, 254, 298, 306, 382, 392, 400, 413, 434.
- 99.** Chapter 099 — Derryvree’s Sedge-Moss Interval (31602 BCE). Sources: References 14, 16, 36, 93, 104, 107, 155, 167, 175, 181, 215, 248, 254, 308, 327, 331, 344, 369, 382, 392, 420, 434.
- 100.** Chapter 100 — Castlepook’s Unresolved Reindeer (31601 BCE). Sources: References 1, 5, 30, 34, 38, 43, 59, 66, 79, 108, 131, 155, 164, 190, 199, 238, 256, 337–338, 391, 395, 416, 435.

References

1. **2022:564 – Castlepook Cave, Castlepook South, Cork**
<https://excavations.ie/report/2022/Cork/0032564/>
2. **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>
3. **A 10Be-Dated Record of Glacial Retreat in Connemara, Ireland, Following the Last Glacial Maximum and Implications for Regional Climate**
<https://research.universityofgalway.ie/en/publications/a-sup10supbe-dated-record-of-glacial-retreat-in-connemara-ireland/>
4. **A 60,000 Year Greenland Stratigraphic Ice Core Chronology**
<https://doi.org/10.5194/cp-4-47-2008>
5. **A 60,000 year Greenland stratigraphic ice core chronology**
https://www.researchgate.net/publication/266620944_A_60_000_year_Greenland_stratigraphic_ice_core_chronology
6. **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/>
7. **A critical review and re-investigation of the Pleistocene deposits between Cranfield Point and Kilkeel, Northern Ireland: Implications for regional sea-level models and glacial reconstructions of the northern Irish Sea basin**
<https://doi.org/10.1016/j.palaeo.2018.04.026>
8. **A critical review and re-investigation of the Pleistocene deposits between Cranfield Point and Kilkeel, Northern Ireland: Implications for regional sea-level models and glacial reconstructions of the northern Irish Sea basin**
<https://www.sciencedirect.com/science/article/abs/pii/S0016787818300415>
9. **Advance and Retreat of the Marine-Terminating Irish Sea Ice Stream into the Celtic Sea During the Last Glacial: Timing and Maximum Extent**
<https://research.bangor.ac.uk/en/publications/advance-and-retreat-of-the-marine-terminating-irish-sea-ice-strea/>
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://www.sciencedirect.com/science/article/pii/S0025322718303372>
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://doi.org/10.1016/j.margeo.2019.03.003>
12. **Advances in Irish Quaternary Studies**
<https://link.springer.com/book/10.2991/978-94-6239-219-9>
13. **Advances in Irish Quaternary Studies**
<https://doi.org/10.2991/978-94-6239-219-9>
14. **Aghnadarragh**
<https://www.habitas.org.uk/escr/site.asp?item=1>
15. **Alice and Gwendoline Cave Excavation, 2019**
<https://excavations.ie/report/2019/Clare/0027706/>
16. **A Middle Midlandian Fresh-Water Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
<https://doi.org/10.1098/rspb.1972.0018>
17. **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
18. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
<https://sheffield.ac.uk/media/19279/download?attachment=>
19. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://www.researchgate.net/profile/Eric-Colhoun-2/publication/257082276_A_Middle_Midlandian_Freshwater_Series_at_Derryvree_Maguiresbridge_County_Fermanagh_Northern_Ireland/links/5f93cfc0a6fdccfd7b810e8c/A-Middle-Midlandian-Freshwater-Series-at-Derryvree-Maguiresbridge-County-Fermanagh-Northern-Ireland.pdf

20. A Middle Midlandian freshwater series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland

<https://royalsocietypublishing.org/doi/10.1098/rspb.1972.0075>

21. AMS radiocarbon dating of ancient bone using ultrafiltration

https://doi.org/10.2458/azu_js_rc.48.2927

22. An All-Ireland Quaternary Map

<https://gsi.ie/publications/publication/an-all-ireland-quaternary-map/>

23. Ancient Hybridization and an Irish Origin for the Modern Polar Bear Matriline

<https://doi.org/10.1016/j.cub.2011.05.058>

24. A New Greenland Ice Core Chronology for the Last Glacial Termination

<https://doi.org/10.1029/2005JD006079>

25. A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula

<https://intarch.ac.uk/journal/issue61/1/6.html>

26. Anthropogenic Changes to the Holocene Nitrogen Cycle in Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6007156/>

27. A Pliocene-Pleistocene Stack of 57 Globally Distributed Benthic $\delta^{18}\text{O}$ Records

<https://doi.org/10.1029/2004PA001071>

28. Archaeological excavations at Killuragh Cave, Co. Limerick

<https://researchrepository.ucd.ie/rest/bitstreams/47195/retrieve>

29. 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>

30. Archaeological Heritage of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/archaeological-heritage-of-county-cork-2020.pdf>

31. Archaeological Site Index to Radiocarbon Dates from Great Britain and Ireland

<https://archaeologydataservice.ac.uk/data-catalogue/resource/f02c779afa448dc806344ffe8c613945218e8dab39ce1de8d7dd382769bada04>

32. Archaeological Survey

<https://www.archaeology.ie/about-us/what-we-do/archaeological-survey/>

33. Archaeology

<https://www.burrengeopark.ie/learn-engage/geology-of-the-burren/archaeology/>

34. Archaeology Research Excavation Grant 2022

https://www.ria.ie/assets/uploads/2024/05/areg_2022_jennings_final_report_web_ready.pdf

35. Archaeology Research Excavation Grant Report: Castlepook Cave Project

<https://www.ria.ie/assets/uploads/2024/10/AREG-2023-Richard-Jennings.pdf>

36. A Reconsideration of the Radiocarbon Dating of the Marine Isotope Stage 3 Fauna from Southern Ireland

<https://doi.org/10.1111/bor.12451>

37. 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>

38. 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>

39. 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>

40. A stratigraphic framework for abrupt climatic changes during the Last Glacial period based on three synchronized Greenland ice-core records

<https://doi.org/10.1002/2014PA002627>

41. 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

42. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

https://research-portal.uu.nl/files/6024881/Stratigraphic_framework.pdf

43. 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>

44. 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

<https://doi.org/10.1016/j.quascirev.2012.07.016>

45. 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

<https://phrepo.phbern.ch/7196/>

46. 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>

47. Atlas of the Irish Rural Landscape: Early Prehistory

<https://www.tcd.ie/media/tcd/geography/pdfs/Atlas2020.pdf>

48. Autumn 2023

<https://www.qub.ac.uk/sites/uas/UASfilestore/Newsletters/UAS%20Newsletter%20Autumn%202023.pdf>

49. Behavioural tendencies of the last British–Irish Ice Sheet revealed by data–model comparison

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3628>

50. Behavioural Tendencies of the Last British–Irish Ice Sheet Revealed by Data–Model Comparison

<https://doi.org/10.1002/jqs.3628>

51. Britain and Ireland: glacial landforms prior to the Last Glacial Maximum

<https://doi.org/10.1016/B978-0-12-823498-3.00050-9>

52. BRITICE-CHRONO: Introduction

<https://britice-chrono.sites.sheffield.ac.uk/project/introduction>

53. BRITICE-CHRONO Maps and GIS Data of the Last British–Irish Ice Sheet 31 to 15 ka

<https://doi.org/10.1594/PANGAEA.945729>

54. 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>

55. 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>

56. 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>

57. 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>

58. BSBI: Fallopia convolvulus

<https://fermanagh.bsbi.org/fallopia-convolvulus-a-love>

59. BSBI: Menyanthes trifoliata

<https://fermanagh.bsbi.org/menyanthes-trifoliata-l>

60. BSBI: Myriophyllum alterniflorum

<https://fermanagh.bsbi.org/myriophyllum-alterniflorum-dc>

61. BSBI: Salix herbacea

<https://fermanagh.bsbi.org/salix-herbacea-l>

62. Castlepook Cave: Cork County Geological Site Report

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/CK032_Cork_CGS_Castlepook_Cave.pdf

63. Castlepook Caves

https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf

64. Cenozoic: Tertiary and Quaternary (until 11,700 years before 2000)

<https://doi.org/10.2307/jj.1263897.18>

65. 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.2022.107514>

66. 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>

67. Climate change and hunter gatherers in Ireland: problems, potentials and pressing research questions

<https://researchrepository.ucd.ie/entities/publication/3a076621-5bd0-483a-9721-a227af59f136>

68. Clogher Valley

<https://www.habitas.org.uk/escr/site.asp?Item=486>

69. Comprehensive uncertainty estimation of the timing of Greenland warmings in the Greenland ice core records

<https://cp.copernicus.org/articles/18/1275/2022/>

70. Conserving Quaternary geoheritage in Northern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0016787822000670>

71. Consistently dated Atlantic sediment cores over the last 40 thousand years

<https://pmc.ncbi.nlm.nih.gov/articles/PMC6718518/>

72. 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/>

73. Could Brown Bears Have Survived in Ireland During the Last Glacial Maximum?

<https://pmc.ncbi.nlm.nih.gov/articles/PMC3730640/>

74. County Geological Heritage Audit Reports

<https://gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/county-geological-heritage-audit-reports/>

75. Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol

<https://cp.copernicus.org/articles/19/915/2023/index.html>

76. Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol

<https://cp.copernicus.org/articles/19/915/2023/>

77. Data - Ice Samples - Software

<https://nbi.ku.dk/english/research/pice/centre-for-ice-and-climate/data/>

78. Dating Constraints on the Last British-Irish Ice Sheet: A Map and Database

<https://doi.org/10.4113/jom.2011.1145>

79. 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/>

80. 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>

81. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland

<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3077>

82. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland

<https://doi.org/10.1002/jqs.3077>

83. 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/>

84. Dimensions and Chronology of the Last Ice Sheet in Western Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379107003022>

85. Dimensions and Chronology of the Last Ice Sheet in Western Ireland

<https://doi.org/10.1016/j.quascirev.2007.10.019>

86. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.021>
87. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.06.023>
88. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.06.005>
89. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.023>
90. **Dimensions and chronology of the last ice sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.09.007>
91. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.12.012>
92. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.11.009>
93. **Dimensions and Chronology of the Last Ice Sheet in Western Ireland**
<https://doi.org/10.1016/j.quascirev.2007.12.023>
94. **Dryas octopetala L.**
<https://fermanagh.bsbi.org/dryas-octopetala-l>
95. **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>
96. **Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British-Irish Ice Sheet**
<https://research.aber.ac.uk/en/publications/dynamic-cycles-ice-streams-and-their-impact-on-the-extent-chronol/>
97. **Early deglaciation of the British-Irish Ice Sheet on the Atlantic margin of Ireland**
<https://eprints.whiterose.ac.uk/140069/8/1-s2.0-S0277379117306157-main.pdf>
98. **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://www.sciencedirect.com/science/article/pii/S0277379117306157>
99. **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/>
100. **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.gla.ac.uk/176547/7/176547.pdf>
101. **Early Deglaciation of Western Ireland and Implications for the Extent, Timing and Impact of the Last British-Irish Ice Sheet**
<https://livrepository.liverpool.ac.uk/3033771/1/OCofaighetal2019Early%20deglaciation%20of%20western%20Ireland.pdf>
102. **Early Last Glacial Intra-Interstadial Climate Variability Recorded in a Stalagmite from Northern Iberia**
<https://nora.nerc.ac.uk/id/eprint/513630/1/Columbu%20-%20Early%20last%20glacial%20intra-interstadial%20climate%20variability%20AAM.pdf>
103. **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
104. **Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland**
https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian,_Pleistocene,_Northern_Ireland
105. **Early Upper Paleolithic Colonization Across Europe: Time and Mode of the Gravettian Diffusion**
<https://pmc.ncbi.nlm.nih.gov/articles/PMC5443572/>
106. **Episodic Speleothem Deposition Tracks the Terrestrial Impact of Millennial-Scale Climate Change in Western Europe**
<https://files01.core.ac.uk/download/pdf/74206935.pdf>

107. 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>

108. 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>

109. 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>

110. Equilibrium Simulations of Marine Isotope Stage 3 Climate

<https://cp.copernicus.org/articles/15/1133/2019/>

111. Equilibrium Simulations of Marine Isotope Stage 3 Climate

<https://doi.org/10.5194/cp-15-1133-2019>

112. ESCR Site Summary: Late Pleistocene Vegetation in Northern Ireland

<https://www2.habitas.org.uk/escr/summary.php?item=101>

113. European vegetation during Marine Oxygen Isotope Stage-3

[https://doi.org/10.1016/S0033-5894\(02\)00016-9](https://doi.org/10.1016/S0033-5894(02)00016-9)

114. European Vegetation During Marine Oxygen Isotope Stage 3

<https://www.cambridge.org/core/journals/quaternary-research/article/abs/european-vegetation-during-marine-oxygen-isotope-stage3/76FE9ACB0B9E623A4B57164188487A4B>

115. Exhibition Galleries

https://www.museum.ie/getmedia/967bf4c8-8a35-4f5d-9fb2-aa51917b58b5/NMI_NHFP-A4-29_07-22_LYTM_Web.pdf

116. Exploring Controls of the Early and Stepped Deglaciation of the Donegal Bay Ice Stream, North-West Ireland

https://research-repository.st-andrews.ac.uk/bitstream/10023/23305/1/Benetti_2021_JQS_Exploring_CC.pdf

117. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet

<https://livrepository.liverpool.ac.uk/3124996/1/jqs.3315.pdf>

118. 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>

119. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet

<https://durham-repository.worktribe.com/output/1243848/exploring-controls-of-the-early-and-stepped-deglaciation-on-the-western-margin-of-the-british-irish-ice-sheet>

120. 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>

121. 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>

122. 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>

123. 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>

124. Extent and Deglacial Chronology of the Last British-Irish Ice Sheet; Implications of Exposure Dating Using Cosmogenic Isotopes

<https://hero.epa.gov/reference/1282551/>

125. 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>

126. 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>

127. Extent and timing of the Last Glacial Maximum (LGM) in Britain and Ireland: a review

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.1404>

128. Extent and timing of the Last Glacial Maximum (LGM) in Britain and Ireland: a review

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.1404>

129. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: A Review

<https://doi.org/10.1002/jqs.1404>

130. Field Guides

<https://iqua.ie/publications/field-guides/>

131. Figure 6—The Subdivision of the Quaternary Period in Ireland

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-17-unlocked.pdf>

132. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://mariondowd.com/wp-content/uploads/2025/04/2016-qsr-palaeolithic-ireland.pdf>

133. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.02.029>

134. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379116300610>

135. 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/>

136. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.02.024>

137. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.03.012>

138. 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>

139. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets, at Aghnadarragh, County Antrim, Northern Ireland

https://www.researchgate.net/publication/229639797_Freshwater_organic_deposits_and_stratified_sediments_between_Early_and_Late_Midlandian_Devensian_till_sheets_at_Aghnadarragh_County_Antrim_Northern_Ireland

140. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian (Devensian) Till Sheets at Aghnadarragh, County Antrim, Northern Ireland

<https://www.habitas.org.uk/literature/searchkeyword.asp?Keyword=Sedimentology&Sort=&startrow=41>

141. Geological Heritage Audit Report: County Cork

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Cork_Audit.pdf

142. Geological Heritage Data and Maps

<https://gsi.ie/ga-ie/data-and-maps/Pages/Geoheritage.aspx>

143. Geological Mapping Programme

<https://www.gsi.ie/ga-ie/programmes-and-projects/geological-mapping/pages/default.aspx>

144. Geology: Educational Resources

<https://www.gsi.ie/en-ie/education/educational-resources/Pages/Geology.aspx>

145. Geology of Ireland

<https://gsi.ie/en-ie/geoscience-topics/geology/Pages/Geology-of-Ireland.aspx>

146. Geology of Ireland

<https://www.gsi.ie/ga-ie/geoscience-topics/geology/pages/geology-of-ireland.aspx>

147. Glacial Geomorphology in the Wicklow Mountains, Ireland

<https://www.tandfonline.com/doi/full/10.1080/17445647.2022.2132885>

148. Gravettian

<https://archeologie.culture.gouv.fr/sculpture-prehistoire/en/glossary/gravettian>

149. Greenland Ice-Core Chronology 2005 (GICC05) for Various Greenland Ice Cores

<https://doi.pangaea.de/10.1594/PANGAEA.943193>

150. Growth, dynamics and deglaciation of the last British-Irish Ice Sheet: the deep-sea ice-rafted detritus record

<https://nora.nerc.ac.uk/id/eprint/11204/>

151. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago

<https://pure.ulster.ac.uk/files/104683424/bor.12594.pdf>

152. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://paleoanthropology.org/ojs/index.php/paleo/article/download/4032/3972/8804>

153. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago

<https://eprints.whiterose.ac.uk/id/eprint/190923/>

154. 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>

155. 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%9090chrono-reconstruction/>

156. 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/10.1111/bor.12594>

157. 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>

158. 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>

159. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://research.bangor.ac.uk/en/publications/growth-and-retreat-of-the-last-britishirish-ice-sheet-31000-to-15/>

160. 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>

161. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://research-repository.st-andrews.ac.uk/handle/10023/26038>

162. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction

<https://nora.nerc.ac.uk/id/eprint/533160/>

163. 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>

164. Guide to the National Museum of Ireland

https://www.museum.ie/getmedia/a3ebbb22-2057-4200-aae8-cd958854d89f/ks_guide_web_en-%281%29.pdf

165. Guide to the National Museum of Ireland

https://www.museum.ie/getmedia/e46732aa-23b9-459c-9522-0a8604f4df98/nhm_guide_web_en_1.pdf

166. Gulf Stream Variability During Marine Isotope Stage 3

<https://doi.org/10.1029/2003PA000966>

167. Heritage Artefacts of County Cork

<https://www.corkcoco.ie/sites/default/files/2023-06/heritage-artefacts-of-county-cork-2021.pdf>

168. High-resolution record of Northern Hemisphere climate extending into the last interglacial period

<https://doi.org/10.1038/nature02805>

169. Hydrographic Survey Data Uncovers Preserved Glacial Landscape

<https://www.gov.uk/government/news/hydrographic-survey-data-uncovers-preserved-glacial-landscape>

170. Ice Age Ireland

https://www.museum.ie/getmedia/acab45bf-2252-4f25-9cf0-c0268f0c7f0d/Ice_Age_Activity_Overview.pdf

171. Ice Age Ireland: Cool Fossils!

https://www.museum.ie/getmedia/48b32fce-19cc-4d70-8e6f-2cf2d7aff73f/Ice_Age_Activity_Mammoth.pdf

172. Ice Sheet Extension to the Celtic Sea Shelf Edge at the Last Glacial Maximum

<https://doi.org/10.1016/j.quascirev.2014.12.010>

173. Ice Sheet Extension to the Celtic Sea Shelf Edge at the Last Glacial Maximum

<https://doi.org/10.1016/j.quascirev.2014.12.019>

174. Ice Sheets and Sea Level of the Last Glacial Maximum

[https://doi.org/10.1016/S0277-3791\(01\)00118-4](https://doi.org/10.1016/S0277-3791(01)00118-4)

175. IntCal

<https://www.intcal.org/>

176. IntCal20

<https://www.cambridge.org/core/journals/radiocarbon/calibrations/intcal-20>

177. IntCal History

<https://intcal.org/history.html>

178. IntCal History

<https://www.intcal.org/history.html>

179. IntCal Publications

<https://www.intcal.org/publications.html>

180. IntCal Publications

<https://intcal.org/publications.html>

181. Introduction to the Glacial Sand and Gravel Landscapes of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=439>

182. Introduction to the Late Quaternary and Holocene of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=101>

183. Investigating Seasonal Mobility in Irish Giant Deer *Megaloceros giganteus* Through Strontium Isotope Analysis

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.3447>

184. IQUA Newsletter No. 58, February 2017

<https://iqua.ie/wp-content/uploads/2018/09/IQUA-NEWSLETTER-58.pdf>

185. 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/>

186. Ireland: Submerged Prehistoric Sites and Landscapes

https://link.springer.com/chapter/10.1007/978-3-030-37367-2_11

187. Ireland: Submerged Prehistoric Sites and Landscapes

https://doi.org/10.1007/978-3-030-37367-2_11

188. Ireland: Submerged Prehistoric Sites and Landscapes

https://pure.ulster.ac.uk/files/78797612/IrelandSubmergedPrehistoricSit_chapter.pdf

189. Ireland: Submerged Prehistoric Sites and Landscapes

https://pure.ulster.ac.uk/ws/portalfiles/portal/78797612/IrelandSubmergedPrehistoricSit_chapter.pdf

190. Ireland: Submerged Prehistoric Sites and Landscapes

<https://www.vliz.be/imisdocs/publications/343799.pdf>

191. Ireland and the Ice Age: Outreach Links, Events & Exhibitions

<https://iqua.ie/outreach-and-education-resources/outreach-links-events-exhibitions/>

192. Ireland Through Geological Time

<https://www.gsi.ie/en-ie/education/the-geology-of-ireland/Pages/Ireland-through-geological-time.aspx>

193. Ireland Through Geological Time

<https://www.gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/>

194. Ireland's Earliest Settlers: Evidence for an Irish Palaeolithic

https://pure.qub.ac.uk/files/373000291/JSmall_thesis_final_2.pdf

195. Ireland's First Settlers: Time and the Mesolithic

<https://www.everand.com/book/295852825/Ireland-s-First-Settlers-Time-and-the-Mesolithic>

196. Irish Association for Quaternary Studies Field Guide 13: The Late Quaternary History of Northern Ireland

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-13-unlocked.pdf>

197. Irish Cave Exploration

<https://www.nature.com/articles/012212b0>

198. Irish Cave Exploration

<https://doi.org/10.1038/012212b0>

199. Irish Pleistocene biostratigraphy

https://www.researchgate.net/publication/290822499_Irish_Pleistocene_biostratigraphy

200. Irish Pleistocene Biostratigraphy

<https://doi.org/10.3318/IRISHJEARHSCI.2019.02>

201. Irish Pleistocene Biostratigraphy

<https://doi.org/10.3318/irisjeartsce.2019.02>

202. Irish Pleistocene Biostratigraphy

<https://doi.org/10.1353/ijes.2019.0012>

203. Irish Quaternary Association

<https://iqua.ie/>

204. Irish Quaternary Association: Outreach and Education Resources

<https://iqua.ie/outreach-and-education-resources/>

205. Irish Quaternary Geomorphology Map Service

https://gsi.geodata.gov.ie/server/rest/services/Quaternary/IE_GSI_Quaternary_Geomorphology_50K_IE26_ITM/MapServer

206. Irish Quaternary Vertebrates

https://link.springer.com/chapter/10.2991/978-94-6239-219-9_10

207. Karst of Ireland

https://gsi.geodata.gov.ie/downloads/Groundwater/Other/GSI_Karst_of_Ireland_David_Drew_2018.pdf

208. 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

209. 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>

210. Last Glacial Maximum cirque glaciation in Ireland and implications for reconstructions of the Irish Ice Sheet

https://aaronmbarth.weebly.com/uploads/3/7/9/8/37989143/barth_et_al__2016__qsr.pdf

211. 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>

212. Last Glacial Maximum cirque glaciation in Ireland and implications for reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.07.002>

213. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.03.022>

214. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.08.012>

215. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.07.013>

216. Lateglacial vegetation and environment in Ireland: First results from four western sites

[https://doi.org/10.1016/0277-3791\(93\)90007-9](https://doi.org/10.1016/0277-3791(93)90007-9)

217. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.011>

218. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://researchportal.plymouth.ac.uk/en/publications/late-pleistocene-chronostratigraphy-and-ice-sheet-limits-southern/>

- 219. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379110000132>
- 220. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://durham-repository.worktribe.com/output/1486214>
- 221. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://doi.org/10.1016/j.quascirev.2010.02.012>
- 222. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://intelligent-earth.ox.ac.uk/publication/340607/scopus>
- 223. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland**
<https://doi.org/10.1016/j.quascirev.2010.05.015>
- 224. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://doi.org/10.1016/j.quascirev.2010.02.010>
- 225. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland**
<https://doi.org/10.1016/j.quascirev.2012.02.013>
- 226. Late Pleistocene Mountain Glacier Response to North Atlantic Climate Change in South West Ireland**
<https://research.aber.ac.uk/en/publications/late-pleistocene-mountain-glacier-response-to-north-atlantic-clim/>
- 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-the-royal-society-of-edinburgh/article/abs/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://researchportalplus.anu.edu.au/en/publications/mammoth-and-musk-ox-esr-dated-to-the-early-midlandian-at-aghnadarragh/>
- 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://openresearch-repository.anu.edu.au/items/769ddf57-2327-4a9e-ad68-ea606103dc4c>
- 232. 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>
- 233. Mammoth Cave**
<https://irishcaves.ubss.org.uk/gazetteer/cork/mammoth-cave/>
- 234. Marine20—The Marine Radiocarbon Age Calibration Curve (0–55,000 cal BP)**
<https://doi.org/10.1017/RDC.2020.68>
- 235. 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/>
- 236. Marine Isotope Stage 3 Sea Level Fluctuations: Data Synthesis and New Outlook**
<https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2007RG000226>
- 237. Marine Isotope Stage 3 Sea Level Fluctuations: Data Synthesis and New Outlook**
<https://doi.org/10.1029/2007RG000226>
- 238. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland**
<https://www.sciencedirect.com/science/article/pii/S027737911530113X>
- 239. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland**
<https://doi.org/10.1016/j.quascirev.2015.07.019>
- 240. 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>

241. 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>

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/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://doi.org/10.1002/jqs.3313>

244. 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>

245. Maximum Extent and Readvance Dynamics of the Irish Sea Ice Stream and Irish Sea Glacier Since the Last Glacial Maximum

<https://livrepository.liverpool.ac.uk/3124994/>

246. 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>

247. Mechanisms of Abrupt Climate Change of the Last Glacial Period

<https://doi.org/10.1029/2006RG000204>

248. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://www.jstor.org/stable/30002377>

249. New Age Constraints for the Maximum Extent of the Last British-Irish Ice Sheet (NW Sector)

<https://nora.nerc.ac.uk/id/eprint/21216/>

250. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379101001020>

251. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00035-2](https://doi.org/10.1016/S0277-3791(01)00035-2)

252. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://doi.org/10.1016/j.quascirev.2010.11.029>

253. New Data on the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(00\)00025-3](https://doi.org/10.1016/S0277-3791(00)00025-3)

254. 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>

255. 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>

256. New Insights on the Fauna of Ireland's Younger Dryas and Early Holocene from Alice & Gwendoline Cave

https://clarecastleballyea.clareheritage.org/wp-content/uploads/sites/5/2025/03/New_insights_on_the_fauna_of_Irelands_Yo_compressed.pdf

257. 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>

258. North GRIP - Greenland Ice Core Chronology 2005 (GICC05) 60,000 Year, 20 Year Resolution

<https://www.ncei.noaa.gov/access/paleo-search/study/6086>

259. Occurrence of Mammalia Relicts at Site Castlepook Cave

<https://doi.pangaea.de/10.1594/PANGAEA.63585>

260. Occurrence of Mammalia Relicts at Site Castlepook Cave

<https://doi.org/10.1594/PANGAEA.63585>

261. 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

262. On the Cave of Castlepook, Near Doneraile, Co. Cork

<https://doi.org/10.1017/S0016756800122435>

- 263. 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
- 264. Origin of British and Irish Mammals: Disparate Post-Glacial Colonisation and Species Introductions**
<https://www.sciencedirect.com/science/article/pii/S0277379114002078>
- 265. 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>
- 266. 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>
- 267. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Ireland**
https://livrepository.liverpool.ac.uk/3073379/1/Callard_marinegeology%20revised.pdf
- 268. Overview of the European Upper Palaeolithic: The Homo sapiens Bone Record**
<https://doi.org/10.1016/j.jasrep.2024.104391>
- 269. OxCal**
<https://c14.arch.ox.ac.uk/oxcal.html>
- 270. OxCal: Radiocarbon Calibration and Analysis**
<https://www.radiocarbon.org.uk/oxcal.html>
- 271. Palaeoecology: Irish Quaternary Association Field Guide**
<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-16-600dpi.pdf>
- 272. Palaeolithic Ireland: Fleeting Footprints in a Frozen Land**
<https://researchonline.ljmu.ac.uk/id/eprint/14938/>
- 273. Pattern, Style and Timing of British–Irish Ice Sheet Advance and Retreat Over the Last 45,000 Years**
<https://doi.org/10.1002/jqs.3296>
- 274. 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/10.1002/jqs.3296>
- 275. 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://eprints.ncl.ac.uk/274545>
- 276. 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>
- 277. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet**
<https://nora.nerc.ac.uk/id/eprint/507486/>
- 278. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet**
<https://www.sciencedirect.com/science/article/pii/S0277379110002817>
- 279. Pattern and timing of retreat of the last British–Irish Ice Sheet**
<https://doi.org/10.1016/j.quascirev.2010.07.019>
- 280. Pattern and timing of retreat of the last British–Irish Ice Sheet**
<https://doi.org/10.1016/j.quascirev.2011.09.016>
- 281. 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](https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20(2012)%2074-84%20Carden%20et%20al.pdf)
- 282. 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://doi.org/10.1016/j.quascirev.2012.02.012>
- 283. 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](https://www.npws.ie/sites/default/files/general/Quaternary%20Science%20Reviews%2042%20(2012)%2074-84%20Carden%20et%20al.pdf)

284. 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://researchrepository.ucd.ie/entities/publication/b73ac3be-b75c-4c5e-a11d-4b488e173e27>

285. Pleistocene Glacial History of the NW European Continental Margin

<https://doi.org/10.1016/j.marpetgeo.2005.09.007>

286. Pleistocene Glacial History of the NW European Continental Margin

<https://nora.nerc.ac.uk/id/eprint/18702/>

287. Pleistocene to Holocene Extinction Dynamics in Giant Deer and Woolly Mammoth

<https://doi.org/10.1038/nature02890>

288. Pleistocene Vertebrates in the British Isles

https://www.rhinosourcecenter.com/pdf_files/133/1336577813.pdf

289. Pleistocene Vertebrates in the British Isles

<https://rhinosourcecenter.com/wp-content/uploads/2012/04/1336577813.pdf>

290. Prehistoric Details

<https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

291. Prehistoric Details

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

292. Prehistoric Details

[https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-\(1\)/Stone-Age/Prehistoric-Details](https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-(1)/Stone-Age/Prehistoric-Details)

293. Prehistoric Ireland

<https://source.museum.ie/en-IE/Museums/Archaeology/Exhibitions/Prehistoric-Ireland>

294. 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

295. Proceedings: Post-glacial colonisation conference

<https://www.irishbiogeographicalociety.com/pdf/OccPub1PostglacialConfIBS.pdf>

296. Proceedings of the Royal Irish Academy, Volume XXXIV, Section B

https://upload.wikimedia.org/wikipedia/commons/d/da/Proceedings_of_the_Royal_Irish_Academy_%281A_proceedingsofro34roya%29.pdf

297. Quaternary

<https://www.gsi.ie/data-and-maps/quaternary/>

298. Quaternary

<https://www.gsi.ie/ga-ie/data-and-maps/Pages/Quaternary.aspx>

299. Quaternary Deposits and Glacial Stratigraphy in Ireland

<https://pure.ulster.ac.uk/en/publications/quaternary-deposits-and-glacial-stratigraphy-in-ireland-3/>

300. Quaternary deposits and glacial stratigraphy in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379187900084>

301. Quaternary Deposits and Glacial Stratigraphy in Ireland

[https://doi.org/10.1016/0277-3791\(87\)90008-4](https://doi.org/10.1016/0277-3791(87)90008-4)

302. Quaternary Geological Map of Ireland

https://inchheritage.org/dist/resources/Quaternary_500k_All_Ireland_Map.pdf

303. Quaternary Geological Map of Ireland 1:500,000 Scale

<https://www.gsi.ie/en-ie/publications/Pages/Quaternary-Geological-Map-of-Ireland-1500%2C000.aspx>

304. Quaternary Geology of Ireland

<https://www.gsi.ie/en-ie/data-and-maps/Pages/Quaternary.aspx>

305. Quaternary Map Services

<https://gsi.geodata.gov.ie/server/rest/services/Quaternary>

306. Quaternary Site Descriptions

<https://iqua.ie/wp-content/uploads/2020/10/Quaternary-sites-of-Ireland-map-INQUA-2019.pdf>

307. Quaternary – Geological Survey Ireland

<https://gsi.ie/data-and-maps/quaternary/>

308. 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>

309. 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>

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.2007.09.001>

311. 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.2007.10.001>

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 Dates from the Oxford AMS System: Archaeometry Datelist 31

<https://doi.org/10.1111/j.1475-4754.2002.tb01101.x>

317. Radiocarbon Dates from the University of Dublin, Trinity College, Ireland

<https://journals.uaiz.arizona.edu/index.php/radiocarbon/article/viewFile/381/386>

318. Radiocarbon Dating and Chronological Modelling

<https://historicengland.org.uk/images-books/publications/radiocarbon-dating-chronological-modelling/radiocarbon-dating/>

319. Rapid Response of Climatic Conditions During the Last Glacial: Evidence from U-Series Dated Irish Speleothems

<https://doi.org/10.1016/j.quascirev.2012.01.007>

320. 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>

321. Recent Developments in Calibration for Archaeological and Environmental Samples

<https://doi.org/10.1017/RDC.2020.49>

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. Relative sea-level changes and crustal movements in Britain and Ireland since the Last Glacial Maximum

<https://www.sciencedirect.com/science/article/abs/pii/S0277379118300040>

324. Relative Sea-Level Changes and Crustal Movements in Britain and Ireland Since the Last Glacial Maximum

<https://doi.org/10.1016/j.quascirev.2018.05.026>

325. Release of 3 New Quaternary Maps

<https://www.gsi.ie/en-ie/events-and-news/news/Pages/Release-of-3-New-Quaternary-Maps.aspx>

326. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

<https://www.sciencedirect.com/science/article/abs/pii/S0277379112000029>

327. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

<https://doi.org/10.1016/j.quascirev.2012.01.001>

328. Response of the Irish Ice Sheet to abrupt climate change during the last deglaciation

<https://pure.ulster.ac.uk/en/publications/response-of-the-irish-ice-sheet-to-abrupt-climate-change-during-t-3/>

329. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

<https://doi.org/10.1016/j.quascirev.2011.12.018>

330. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations

<https://pure.atu.ie/en/publications/revisiting-alice-and-gwendoline-cave-co-clare-new-light-on-the-19-3/>

- 331. Revisiting Alice and Gwendoline Cave, Co. Clare: New Light on the 1902 Excavations**
<https://doi.org/10.3318/PRIAC.2021.121.07>
- 332. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia**
<https://doi.org/10.64898/2026.07.10.737191>
- 333. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia**
<https://www.biorxiv.org/content/10.64898/2026.07.10.737191v1>
- 334. Sedimentary and foraminiferal records of Late Quaternary environmental change west of Ireland and implications for the last British–Irish Ice Sheet**
<https://doi.org/10.1002/jqs.3208>
- 335. Sedimentary and Foraminiferal Records of Late Quaternary Environmental Change West of Ireland and Implications for the Last British–Irish Ice Sheet**
<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3208>
- 336. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland**
<https://eprints.whiterose.ac.uk/id/eprint/102848/>
- 337. *Selaginella selaginoides***
<https://fermanagh.bsbi.org/selaginella-selaginoides-p-beauv>
- 338. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles**
<https://cp.copernicus.org/articles/21/261/2025/>
- 339. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles**
<https://doi.org/10.5194/cp-21-261-2025>
- 340. Spotted Hyena Skull**
<https://cms.museum.ie/en-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4>
- 341. Stone Age**
<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age>
- 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://research.ucc.ie/en/publications/stratigraphic-and-palaeo-geomorphological-evidence-for-the-glacia/>
- 343. 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>
- 344. 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>
- 345. 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.2014.04.003>
- 346. The Archaeology of Caves in Ireland**
<https://caves.org/wp-content/uploads/Publications/JCKS/v78/cave-78-03-218.pdf>
- 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 Brown Bear (*Ursus arctos* L.) in Ireland**
https://www.researchgate.net/publication/379235493_The_Brown_Bear_Ursus_arctos_L_in_Ireland
- 349. The Colonization of Ireland: A Human Ecology Perspective**
<https://www.sciencedirect.com/science/article/pii/S0277379120305941>
- 350. The Colonization of Ireland: A Human Ecology Perspective**
<https://doi.org/10.1016/j.quascirev.2020.106421>
- 351. The Colonization of Ireland: A Human Ecology Perspective**
<https://doi.org/10.1016/j.quascirev.2020.106759>

352. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106632>

353. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106781>

354. The colonization of Ireland: A human ecology perspective

https://hungarcolab.weebly.com/uploads/1/3/0/2/130279092/tune_2020_-_colonization_of_ireland.pdf

355. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106427>

356. The deglaciation of the western sector of the Irish Ice Sheet

<https://eprints.whiterose.ac.uk/161427/1/bor.12448.pdf>

357. 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>

358. 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>

359. 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/10.1111/bor.12448>

360. 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/>

361. The Evolution of the Terrestrial-Terminating Irish Sea Glacier During the Last Glaciation

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3229>

362. The Exploration of Castlepook Cave, Co. Cork. With 3 Plates.

https://sources.nli.ie/Record/PS_UR_073459

363. The Exploration of Castlepook Cave, County Cork

https://upload.wikimedia.org/wikipedia/commons/a/a2/Geological_magazine_%28IA_geologicalmagazi651918wood%29.pdf

364. The Exploration of Castlepook Cave, County Cork

https://www.cambridge.org/core/services/aop-cambridge-core/content/view/954225B0449C3241B2832BF4AF5456AB/S0016756800122435a.pdf/notices_of_memoirs.pdf

365. The Exploration of Castlepook Cave, County Cork

<https://www.biodiversitylibrary.org/item/108026>

366. 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>

367. The Exploration of the Caves of Kesh, County Sligo

<https://archive.org/details/transactionsofro32roya>

368. The Geological Heritage of County Cork

<https://www.gsi.ie/en-ie/publications/pages/the-geological-heritage-of-county-cork.aspx>

369. The Geological Heritage of County Leitrim

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Leitrim_Audit.pdf

370. The Geology of Ireland

<https://files.core.ac.uk/download/pdf/297011667.pdf>

371. The Geology of the Irish Sea: UK Offshore Regional Report

<https://webapps.bgs.ac.uk/Memoirs/docs/B01847.html>

372. The Glacial Deposits of the Maguires-Bridge Area, County Fermanagh, Northern Ireland

https://sources.nli.ie/Record/PS_UR_062717

373. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 1: Constructing the Time Scale

<https://www.sciencedirect.com/science/article/pii/S0277379106002587>

- 374. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 1: Constructing the Time Scale**
<https://doi.org/10.1016/j.quascirev.2006.08.002>
- 375. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 2: Comparison to Other Records**
<https://epic.awi.de/14875/1/Kro2006b.pdf>
- 376. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 2: Comparison to Other Records**
<https://doi.org/10.1016/j.quascirev.2006.08.003>
- 377. The Greenland Ice Core Chronology 2005, 15–42 ka. Part 2: Comparison to Other Records**
<https://doi.org/10.1029/2006JD008091>
- 378. The Horse in Late Pleistocene Britain and Ireland**
<https://discovery.ucl.ac.uk/1318059/1/322047.pdf>
- 379. The Human Colonisation of Ireland in Northwest European Context**
https://link.springer.com/chapter/10.2991/978-94-6239-219-9_11
- 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://doi.org/10.1017/RDC.2020.41>
- 383. 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>
- 384. 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>
- 385. 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>
- 386. 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
- 387. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)**
<https://eprints.gla.ac.uk/210753/>
- 388. 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/the-intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-0-55-cal-kbp.pdf>
- 389. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP) PDF**
<https://www.cambridge.org/core/services/aop-cambridge-core/content/view/83257B63DC3AF9CFA6243F59D7503EFF/S0033822220000417a.pdf>
- 390. The Irish Ice Sheet and Relative Sea-Level Modelling**
<https://www.tara.tcd.ie/bitstreams/969fd7c8-36ef-4262-a961-336fe7285015/download>
- 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](https://doi.org/10.1016/S0277-3791(96)00037-6)
- 393. The Irish Quaternary Fauna Project**
<https://www.sciencedirect.com/science/article/pii/S0277379196000376>
- 394. The Irish Quaternary Fauna Project**
<https://www.sciencedirect.com/science/article/abs/pii/S0277379196000376>

395. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?

<https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-78ce11d608ab>

396. The Island of Ireland: Drowning the Myth of an Irish Land-bridge?

<https://www.tara.tcd.ie/tara8/server/api/core/bitstreams/496ba918-8adf-486f-a535-e9ede845c72f/content>

397. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?

<http://hdl.handle.net/2262/40560>

398. The Last Glacial Maximum

<https://doi.org/10.1126/science.1172873>

399. The Last Glacial Maximum

<https://pubs.usgs.gov/publication/70036965>

400. The Last Glacial Maximum

<https://www.usgs.gov/publications/last-glacial-maximum>

401. The Last Irish Ice Sheet: Extent and Chronology

https://doi.org/10.2991/978-94-6239-219-9_5

402. 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/>

403. The Last Scottish Ice Sheet

<https://www.cambridge.org/core/journals/earth-and-environmental-science-transactions-of-the-royal-society-of-edinburgh/article/abs/last-scottish-ice-sheet/4730FF8269481713CCD4B3F58B7BBE0E>

404. 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>

405. The Mammoth Caves of Castlepook, Near Doneraile

<https://corkhist.ie/wp-content/uploads/jfiles/1905/b1905-003.pdf>

406. The Marine $\delta^{18}\text{O}$ Record Overestimates Continental Ice Volume During Marine Isotope Stage 3

<https://doi.org/10.1016/j.gloplacha.2022.103814>

407. Themes: Quaternary

<https://www.gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/themes/>

408. Themes: Quaternary

<https://gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/themes/>

409. The Mesolithic in Ireland: when was it?

<https://www.heritagecouncil.ie/content/files/Our-Ancient-Landscapes-Hunter-Gatherers-in-Ireland.pdf>

410. The Nature and Timing of MIS 3 Interstadials: New Constraints from U-Series Dated Speleothems from Crag Cave, S.W. Ireland

<https://doi.org/10.1016/j.quaint.2012.08.078>

411. The Nature of MIS 3 Stadial–Interstadial Transitions in Europe: New Insights from Model–Data Comparisons

<https://www.sciencedirect.com/science/article/pii/S0277379111002381>

412. The Nature of MIS 3 Stadial–Interstadial Transitions in Europe: New Insights from Model–Data Comparisons

<https://doi.org/10.1016/j.quascirev.2010.07.017>

413. 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>

414. The Problem of a Late Quaternary Landbridge Between Britain and Ireland

[https://doi.org/10.1016/0277-3791\(85\)90028-9](https://doi.org/10.1016/0277-3791(85)90028-9)

415. The problem of a late quaternary landbridge between Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/0277379185900289>

416. The Problem of a Late Quaternary Landbridge Between Britain and Ireland

<https://www.sciencedirect.com/science/article/abs/pii/0277379185900289>

417. The Quaternary History of Ireland

<https://catalogue.nli.ie/Record/vtls000090300>

418. The Stratigraphic Position and Age of the Gortian

https://www.burren geopark.ie/wp-content/uploads/2014/08/GSI-The_Stratigraphic_Position_and_Age_of_the_Gor.pdf

419. 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>

420. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2

<https://doi.org/10.1002/jqs.3611>

421. 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://onlinelibrary.wiley.com/doi/10.1002/jqs.3611>

422. 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://www.citedrive.com/en/discovery/the-timing-and-magnitude-of-the-british-irish-ice-sheet-between-marine-isotope-stages-5d-and-2-implications-for-glacioisostatic-adjustment-high-relative-sea-levels-and-giant-erratic-emplacement/>

423. The Tolsta Interstadial, Scotland: Correlation with D–O Cycles GI-8 to GI-5?

<https://www.sciencedirect.com/science/article/abs/pii/S0277379101000683>

424. The Vertebrates of the Last Cold Stage in Britain and Ireland

https://www.researchgate.net/publication/247604648_The_vertebrates_of_the_last_cold_stage_in_Britain_and_Ireland

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://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3295>

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://mural.maynoothuniversity.ie/id/eprint/16633/>

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/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://livrepository.liverpool.ac.uk/3121749/>

432. Timing of Glaciation During the Last Glacial Cycle: Evaluating the Concept of a Global ‘Last Glacial Maximum’

<https://doi.org/10.1016/j.earscirev.2013.07.003>

433. Tipperary County Geological Site Report: Ardfinnan

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/TY003_Ardfinnan.pdf

434. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://doi.org/10.1111/bor.12109>

435. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://onlinelibrary.wiley.com/doi/10.1111/bor.12109>

436. UCD School of Archaeology Research Day 2022

https://www.ucd.ie/archaeology/t4media/UCD_Archaeology_Research_Day_2022.pdf

437. 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>

438. 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.2006.12.003>

439. What Was on the Menu in Prehistoric Ireland?

<https://www.rte.ie/brainstorm/2025/0815/1475736-prehistoric-ireland-food-mesolithic-iron-age-bronze/>

Index

Agriculture, 1318, 1361, 1373, 1385, 1437, 1449, 1459, 1469, 1561, 1585

Antrim, 1278, 1333, 1535–1536

Awbeg, 1317, 1409, 1444, 1448, 1475–1476, 1519–1520, 1551–1552, 1556, 1573, 1592, 1596, 1603–1604, 1606, 1650

Awbeg Valley, 1317, 1409, 1444, 1448, 1476, 1520, 1552, 1556, 1573, 1592, 1596, 1604, 1606, 1650

Birm-166, 1277, 1308–1309, 1431, 1456, 1471, 1491, 1575–1576, 1579, 1592, 1599, 1615, 1628, 1631, 1639, 1655

British-Irish Ice Sheet, 1288, 1314, 1432

Bronze Age, 1419

Castlepook, 1271–1272, 1274–1276, 1278, 1282–1283, 1285–1287, 1289–1295, 1297–1298, 1301–1308, 1310–1315, 1317–1319, 1321–1323, 1325–1327, 1330–1331, 1333–1334, 1337–1339, 1342–1347, 1349–1351, 1353–1355, 1357–1363, 1365–1366, 1368–1369, 1372–1373, 1376–1382, 1384–1386, 1388, 1392–1398, 1400–1402, 1404–1410, 1412–1414, 1417–1418, 1420–1421, 1425–1426, 1428–1429, 1432–1438, 1440–1445, 1448–1450, 1452–1453, 1457, 1460–1462, 1464–1470, 1473, 1476–1478, 1480–1481, 1483–1490, 1492–1494, 1496–1502, 1504–1505, 1508–1509, 1512–1513, 1515–1517, 1520–1526, 1528–1530, 1532–1534, 1536–1539, 1541–1542, 1544–1545, 1547–1550, 1552–1554, 1556–1558, 1560–1561, 1564–1567, 1569–1573, 1576–1582, 1584–1585, 1588–1594, 1596–1598, 1600–1602, 1604–1606, 1608–1609, 1612–1613, 1616–1617, 1621, 1624–1625, 1628–1630, 1632–1637, 1640–1641, 1643–1645, 1648–1649, 1653–1654, 1657, 1660–1666

Clare, 1275, 1314, 1318, 1326, 1360, 1381, 1389, 1393, 1437, 1441, 1449, 1453, 1473, 1481, 1493, 1501, 1505, 1513, 1525, 1541, 1549, 1573, 1605, 1629, 1641, 1649, 1663

Connacht, 1349

County Fermanagh, 1269–1270, 1273, 1277, 1281, 1285, 1288, 1293, 1296, 1300, 1305, 1308, 1320, 1324, 1328, 1332–1333, 1336, 1340–1341, 1344, 1349, 1353, 1356, 1363, 1368, 1375, 1383, 1387, 1391, 1395–1396, 1399, 1403–1404, 1408, 1412, 1416, 1419, 1423, 1427, 1431, 1440, 1444, 1448, 1451, 1456, 1459, 1463, 1468, 1471, 1475, 1480, 1488, 1491, 1496, 1498, 1503, 1507, 1511, 1516, 1519, 1523, 1527, 1529, 1531, 1535–1536, 1539, 1545, 1549, 1551, 1555, 1559, 1563, 1567, 1571, 1575, 1579, 1583, 1587, 1592, 1595, 1599, 1604, 1607, 1611, 1615, 1619, 1623, 1627, 1632, 1636, 1639, 1644, 1648, 1651, 1655, 1659, 1664

Crag Cave, 1278, 1281, 1283, 1293, 1295, 1309, 1313, 1341, 1388, 1411, 1414, 1418, 1424, 1456, 1459–1460, 1462, 1494, 1518, 1524, 1532, 1580, 1584, 1588, 1590, 1600, 1608, 1616–1617, 1620, 1625, 1644–1645, 1656, 1660, 1662, 1666

Derryvree, 1269–1270, 1272–1277, 1279, 1281, 1283–1285, 1287–1289, 1293, 1295–1301, 1303, 1305, 1308–1311, 1320–1321, 1323–1325, 1327–1329, 1331–1337, 1339–1341, 1343–1345, 1347, 1349, 1353, 1356–1358, 1363–1364, 1366, 1368, 1372, 1375–1378, 1383–1384, 1386–1394, 1396, 1399–1400, 1402–1404, 1406, 1412, 1414, 1416, 1418–1421, 1423–1429, 1431–1432, 1434, 1440, 1442, 1444, 1448, 1450–1451, 1455–1457, 1459–1464, 1466, 1468, 1470–1473, 1475–1476, 1478, 1480, 1488, 1490–1496, 1498, 1503–1505, 1507–1514, 1516, 1519–1520, 1522–1524, 1529–1532, 1534, 1536, 1539–1540, 1545–1546, 1549–1552, 1554–1556, 1558–1560, 1563–1564, 1566–1572, 1575–1580, 1583–1584, 1587–1588, 1590, 1592, 1594–1596, 1598–1600, 1602, 1604, 1607–1617, 1619–1624, 1626–1628, 1631–1634, 1636, 1639–1640, 1642, 1644–1645, 1648, 1651–1660, 1662, 1664, 1666

Donegal, 1440, 1552, 1572

Doneraile, 1271, 1274, 1278, 1280, 1282, 1285, 1289, 1293, 1297, 1301, 1304–1305, 1308, 1312, 1317, 1321, 1325, 1330, 1333–1334, 1337, 1342, 1344–1345, 1349, 1353, 1357, 1360, 1363, 1365, 1368, 1372, 1376, 1379–1381, 1384, 1388, 1392, 1396, 1400, 1404, 1407, 1412–1413, 1417, 1420, 1425, 1428, 1432, 1435, 1437, 1440, 1444, 1447–1448, 1452, 1454, 1457, 1460, 1464, 1468–1469, 1473, 1476, 1480, 1484, 1488, 1492, 1496, 1500, 1504, 1508, 1512, 1516, 1520, 1524, 1527–1528, 1532, 1536, 1539, 1543–1544, 1548, 1552, 1556, 1560, 1563–1564, 1567, 1569, 1572, 1576, 1580, 1583–1584, 1588, 1592, 1596, 1600, 1604, 1608, 1612, 1616, 1621, 1624, 1628, 1632, 1636, 1640, 1644, 1648, 1653, 1657–1658, 1660, 1664

Down, 1285, 1313, 1389, 1416, 1423, 1431, 1440, 1472, 1488, 1516, 1520, 1531, 1536, 1563, 1568, 1587, 1595, 1612, 1619, 1648, 1660

Dublin, 1483

Education, 1421, 1489

Flora, 1305, 1309, 1321, 1336–1337, 1340, 1353, 1404, 1466, 1496, 1503, 1512, 1529, 1588, 1597, 1613, 1620

Galway, 1532

Greenagho, 1270, 1274, 1278, 1281, 1288, 1293, 1333, 1341, 1349, 1357, 1368, 1384, 1392, 1400, 1403–1404, 1406, 1416, 1428, 1451, 1463, 1480, 1512, 1536, 1552, 1572, 1580, 1596, 1620, 1624, 1628, 1640, 1656

Hyenahall, 1271, 1392, 1448, 1479–1480, 1500, 1541

Ice Age, 1269–1270, 1272–1276, 1280, 1284–1285, 1287–1288, 1292, 1294–1296, 1298, 1300, 1304, 1306–1308, 1312–1313, 1315–1316, 1320–1321, 1323, 1328, 1331–1332, 1335–1336, 1340–1345, 1347–1348, 1352, 1354, 1356–1357, 1359, 1361–1364, 1371, 1373, 1375, 1379, 1382–1383, 1386, 1388, 1390, 1392–1393, 1395–1396, 1398–1400, 1403–1407, 1412, 1414–1419, 1421, 1423, 1425–1426, 1428–1429, 1434, 1436, 1438–1439, 1441, 1443, 1447, 1450–1451, 1453–1455, 1458–1459, 1467, 1471, 1473, 1476, 1478–1480, 1483–1484, 1486–1488, 1490–1494, 1497–1502, 1504, 1506, 1508, 1510, 1512, 1516–1517, 1519, 1523–1524, 1528–1533, 1535, 1539, 1542–1544, 1546–1548, 1551, 1555, 1557, 1559, 1561, 1563, 1567–1571, 1575, 1577–1580, 1582–1585, 1587–1589, 1591, 1595–1596, 1599, 1603, 1605–1608, 1614–1615, 1618, 1622, 1628, 1630–1632, 1634–1635, 1639–1640, 1642–1643, 1645–1646, 1653, 1658–1660, 1662, 1664–1665

Industry, 1346, 1389, 1437, 1541, 1665

Irish language, 1330, 1359, 1609

Kerry, 1278, 1281, 1293, 1309–1310, 1341, 1388, 1411, 1418, 1424, 1456, 1460, 1518, 1524, 1526, 1532, 1580, 1584, 1588, 1608, 1616, 1625, 1644, 1656, 1660, 1663, 1666

Leinster, 1349

Leitrim, 1352, 1479, 1659

Limerick, 1284, 1419

Literature, 1507

Louth, 1409, 1493

Maguirebridge, 1439, 1491, 1555, 1615, 1627, 1631

Maguiresbridge, 1269, 1273, 1277–1278, 1281, 1285, 1288, 1293, 1296, 1300, 1305, 1308, 1320, 1324, 1328, 1332–1333, 1336, 1340, 1344, 1349, 1353, 1356, 1363–1364, 1372, 1375, 1383, 1387, 1391, 1396, 1399, 1402–1403, 1412, 1415–1416, 1419, 1423, 1427, 1431, 1440, 1444, 1448, 1456, 1459, 1463, 1468, 1471, 1475, 1480, 1488, 1491, 1496, 1503, 1507, 1511, 1516, 1519, 1523, 1529, 1531, 1535–1536, 1539–1540, 1545, 1549, 1551, 1555, 1559, 1563, 1567–1568, 1571–1572, 1575, 1583, 1587, 1592, 1595, 1599–1600, 1604, 1607, 1611, 1615, 1619, 1621, 1623, 1627, 1631, 1636, 1639, 1644, 1648, 1651, 1655–1656, 1659, 1664

Mammoth Cave, 1274, 1278, 1282, 1305, 1312, 1317, 1342, 1345, 1349, 1357, 1360, 1363, 1372, 1379, 1384, 1388, 1396, 1404, 1407, 1417, 1420, 1428, 1435, 1440, 1451–1452, 1463–1464, 1476, 1480, 1484, 1488, 1496, 1508, 1512, 1516, 1524, 1528, 1539, 1544, 1552, 1560, 1564, 1569, 1572, 1576, 1584, 1592, 1604, 1612, 1621, 1628, 1632, 1636, 1644, 1647–1648

Mayo, 1608

Mesolithic, 1282, 1306, 1373–1374, 1421, 1433, 1457, 1484, 1505, 1613, 1630, 1661

Migration, 1294, 1329, 1334, 1346, 1373, 1393, 1401, 1457, 1461, 1468, 1479, 1485, 1496, 1513, 1516, 1529, 1533, 1537, 1547, 1553, 1557, 1569, 1592, 1604, 1613, 1629, 1652, 1665

Munster, 1349

Music, 1286, 1323, 1355, 1361, 1381, 1393, 1401, 1469, 1493, 1510, 1529, 1581, 1630

Neolithic, 1465

North Cork, 1288–1289, 1292, 1301, 1310, 1313–1315, 1351, 1354–1355, 1374, 1376, 1383–1384, 1388, 1392, 1395, 1408, 1417, 1420, 1429, 1432, 1450, 1500, 1502, 1529, 1536, 1538, 1548, 1558, 1568, 1574–1575, 1592–1594

Palaeoenvironment, 1325, 1372, 1463, 1610

Permafrost, 1270, 1372, 1392, 1400, 1412, 1427, 1518, 1529, 1640

Transport, 1287, 1294, 1297, 1361, 1373, 1377, 1382, 1400–1401, 1437, 1461, 1480, 1485, 1489, 1493, 1500, 1505, 1521, 1528, 1533, 1537, 1541, 1580, 1593, 1596, 1598, 1609, 1632, 1648

Ulster, 1349

Waterford, 1504

Wicklow, 1443, 1483, 1571



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