

Emerald Gazette
Tundra Plains

31100–31001 BCE

Issue 010 of 340

Compiled & Edited by Gerard J. Hannan BA MBS MA



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First Edition

Published 2026

Emerald Gazette

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

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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.

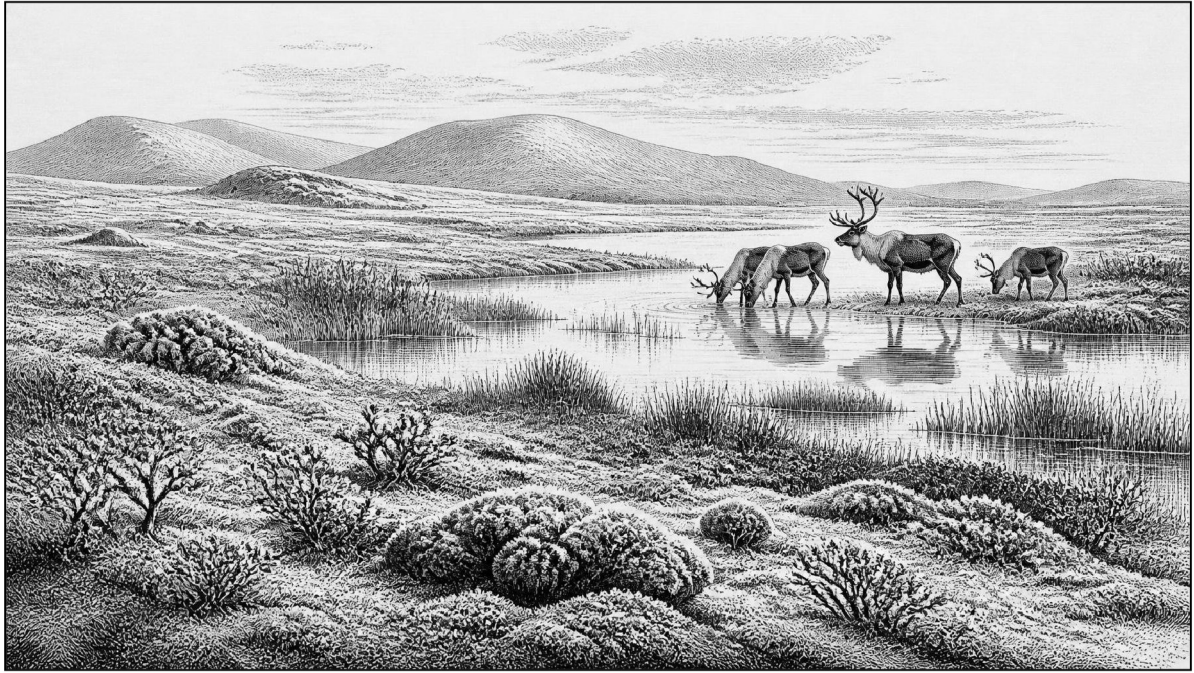
Every issue should therefore be understood both as an individual publication and as another chapter in a much larger project. Read separately, each volume offers a portrait of a particular historical period. Read together, the complete collection becomes an extended chronological journey through the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

31100 BCE

Maguirebridge's Buried Sedgebed^[1]



Modern calendar-year precision is not available for Ireland in 31,100 BCE. This is a modern label applied to a point roughly 33,050 years before AD 1950, the conventional “present” of radiocarbon chronology. No Irish community then recorded years, rulers, journeys or battles; nor does any excavated layer preserve the events of a single twelve-month span. The responsible history of this moment must therefore be written in calibrated ranges, sediments, fossils and carefully limited inference.

In archaeological terms, the date falls in the Late Pleistocene, during Marine Isotope Stage 3, within the long Midlandian cold stage of Irish Quaternary history. It was well before the Last Glacial Maximum, when ice later reached much greater extent across Ireland and the surrounding continental shelf. The climate was not simply and continuously “Ice Age cold”. It was unstable on scales far longer than a human lifetime but short in geological terms, with shifts in temperature, moisture, vegetation and ice cover. Ireland’s evidence is patchy because later glaciers eroded landscapes, moved older material and buried what survived.

A Date Within a Range

The most important Irish record relevant to this date is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a remarkable sequence inside a drumlin: freshwater silts and fine sands, rich in organic material, lay between two tills. Till is the unsorted debris deposited directly by glacier ice. The sequence provides firm relative evidence: ice had previously occupied the site; conditions later permitted standing or slow-moving fresh water, plants and sediment to accumulate; and ice subsequently advanced across the locality again, sealing the deposit.

Organic material from the Derryvree freshwater series returned a conventional radiocarbon age of about 30,500 radiocarbon years BP, with a substantial laboratory uncertainty. Once calibrated, published estimates place the deposit broadly between about 36,900 and 31,700 calendar years BP. The modern date of 31,100 BCE lies within that broad interval. It does not, however, date every grain of silt, every fossil or every phase of the wetland to that exact year. Calibration is essential because atmospheric carbon-14 levels have varied over time, and uncertainty becomes considerable at this depth of the past.

This distinction matters. Derryvree is direct evidence for an ice-free freshwater episode at one northern Irish locality during the wider period. It is not proof that all of Ireland was ice-free at once, that the same vegetation grew everywhere, or that a particular family camped nearby in 31,100 BCE. Yet its very survival beneath later glacial deposits makes it one of the clearest windows onto the changing Irish environment before the full severity of the last glacial maximum.

Water, Sedges and Open Ground

The Derryvree deposits point to a cold, open and largely treeless landscape with wet ground capable of sustaining freshwater life. Plant macrofossils, pollen and insects from such inter-till deposits are more informative about local ecology than any broad painted image of an Ice Age wilderness. Sedges, mosses, low herbs and aquatic plants indicate marshes, shallow pools and saturated hollows. The wider terrain is best envisaged as a mosaic: exposed mineral ground, wet depressions, streams or pond margins and sparse low vegetation, all shaped by short growing seasons, frost and seasonal change.

Comparable evidence from Greenagho near Belcoo, also in County Fermanagh, reinforces the conclusion that north-western Ireland experienced episodes of non-glacial conditions during the Middle Midlandian. At Greenagho, organic detritus below later till has yielded a calibrated range of roughly 37,200–35,700 years BP. It is older than the notional date considered here, but it helps establish the regional pattern: ice advance, retreat or thinning did not proceed as a single simple march. Freshwater habitats could develop in places later overwhelmed by renewed ice.

Crag Cave in County Kerry offers a second, very different environmental archive. Uranium-thorium dating of broken and reworked cave calcite shows repeated episodes of speleothem growth through Marine Isotope Stage 3. Since calcite formation in this shallow cave required liquid water moving through soil and rock, the record indicates intermittent amelioration in south-west Ireland. It should not be treated as a thermometer for a particular year at Maguiresbridge. Together with Derryvree, however, it demonstrates that late-Pleistocene Ireland contained local environmental opportunities amid an overall trajectory towards harsher glacial conditions.

Animals on a Changing Island

Cave collections, especially from southern Ireland, show that a diverse cold-stage fauna reached the island during the wider pre-maximum period. Reindeer, red deer, giant deer, woolly mammoth, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena all appear in the Irish Quaternary record, though not necessarily as contemporaries at one site or in one generation. The evidence is often from nineteenth- and early twentieth-century excavations, when recording standards were uneven and deposits could be disturbed. Modern radiocarbon re-dating has therefore been crucial, and it has altered several earlier assumptions about the age of the southern cave fauna.

Castlepook Cave, near Doneraile in north County Cork, is particularly important. Its assemblage includes remains of large herbivores and predators associated with the wider Marine Isotope Stage 3 world. Reindeer were well suited to open, cold habitats and could have moved through landscapes where wetland vegetation, grasses and herbs supplied seasonal forage. Predators and scavengers, including hyaenas, remind us that carcasses and bones do not automatically record human activity. A cave bone may have arrived through natural death, carnivore transport, scavenging, water movement or excavation disturbance.

The fauna permits a measured conclusion: Ireland was not biologically empty around this broad phase of the Late Pleistocene. It hosted, at least intermittently, animal communities whose ranges extended across north-west Europe. It does not permit a precise reconstruction of herd size, migration routes or the appearance of the countryside in 31,100 BCE. Nor should every famous Ice Age animal be placed together in an imagined scene. The correct emphasis is on changing habitats and unevenly dated evidence.

The Human Question

This date has unusual significance because a reindeer femur from Castlepook has been reported as bearing a deep mark consistent with processing by a sharp stone tool. The bone has been presented by Irish heritage authorities as approximately 31,000 BCE, making it potentially the earliest indication of human activity in Ireland by a very large margin. If that interpretation is accepted, it suggests that people reached Ireland during the Late Palaeolithic and used at least part of a reindeer carcass.

That is an important but narrow claim. A dated animal bone and a possible butchery mark do not establish a permanent settlement, a population size, a named archaeological culture, a house, a burial ground or a continuing line of descent. No securely associated camp surface, hearth, stone-tool assemblage or human remains is presently available from Castlepook for this early episode. Renewed fieldwork has sought to understand the cave's surviving deposits and context, but the old excavations and disturbed collections impose real limits. Around 31,100 BCE, a short visit by mobile hunter-gatherers is a possibility supported by the interpretation of the marked bone; enduring occupation remains unproven.

Nothing responsible can be said of political affairs, diplomacy or organised conflict in the later historical sense. There is no evidence for polities, chiefs, territories, treaties or warfare. If people entered the island, their social world was almost certainly organised on a far smaller scale than later farming or metal-using societies. Co-operation in travel, food sharing, shelter-making and carcass processing is a reasonable general inference for highly mobile foragers, but it cannot be assigned specifically to any Irish group. Similarly, there is no direct evidence for ritual, language, visual art or formal learning in Ireland at this date.

Movement, Resources and Distance

The economy, if humans were present, would have rested on wild resources rather than farming. There were no crops, livestock, fields, pottery industries or monuments. Hunting, scavenging, gathering plant foods when seasonally available, and the practical knowledge needed to move through cold terrain are plausible elements of a Palaeolithic lifeway. But there is no Irish evidence from this horizon to identify specific weapons, clothing, boats or exchange goods. Even the journey to Ireland cannot be reconstructed with confidence.

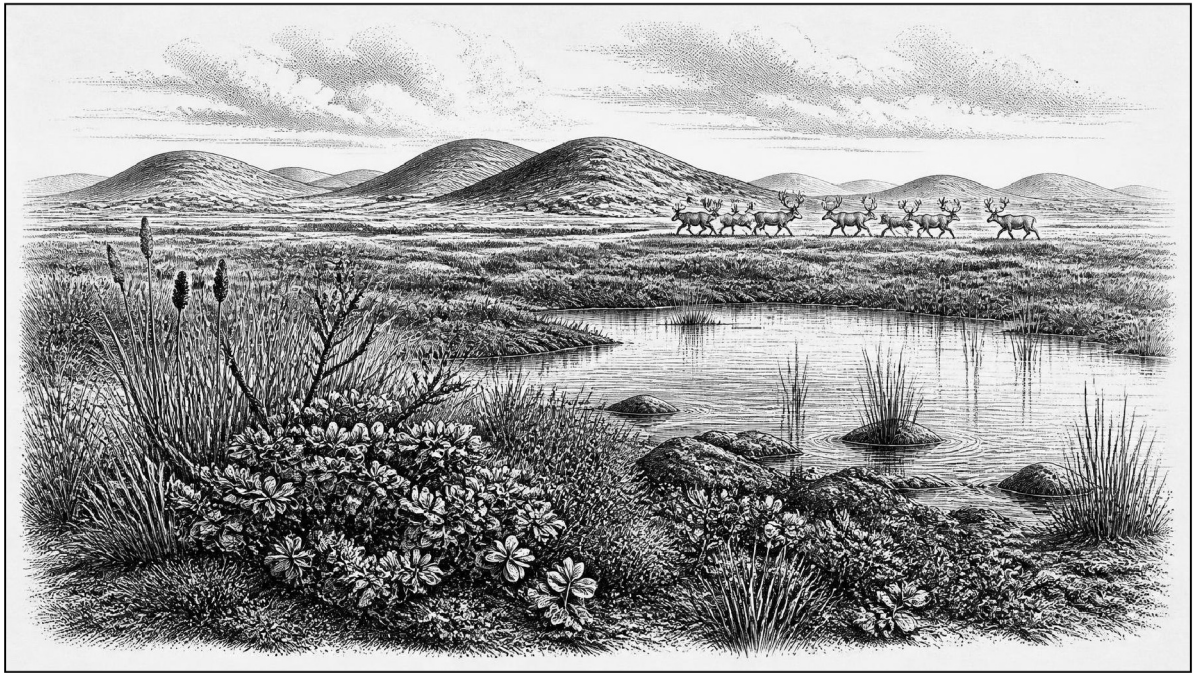
Global sea level was lower than today because vast quantities of water were held in ice sheets, exposing areas of the continental shelf. Yet lower seas did not necessarily create a simple walkable land bridge between Ireland and Britain. The changing form of the Irish Sea basin, local ice loading, coastlines and waterways makes the issue more complex. Faunal and possible human arrival show that dispersal occurred at some point in the wider period; they do not identify a route, season or mode of crossing. Any statement that people merely walked into Ireland would exceed the evidence.

The main development around 31,100 BCE was therefore environmental, not political: a fluctuating late-Pleistocene Ireland in which freshwater wetlands and open cold-country vegetation existed in some places, mammals moved through an unstable north-west European world, and expanding ice increasingly narrowed ecological possibilities. Derryvree's buried sedgebed preserves this reality with exceptional clarity. It offers no annual chronicle, but it records a living landscape that later ice nearly erased.

Chapter 002 of 100

31099 BCE

Reindeer Bone, Drumlin Silt^[2]



The label 31,099 BCE cannot be attached to a known Irish event, ruler, journey or settlement. No calendar used in Ireland at this depth of time survives, and archaeological science cannot resolve a single year so far back. In simple calendar arithmetic, the date is roughly 33,050 years before the 1950 reference point used for “before present” dating, but that is not itself a radiocarbon or calibrated age. The responsible history of this moment is therefore a history of overlapping date ranges, deposits and carefully limited inferences.

Ireland lay in the Late Pleistocene, within the long cold phase conventionally called the Midlandian in Irish geology and broadly corresponding to Marine Isotope Stage 3. It was not yet the Ireland of farms, forests, monuments or permanent villages. The strongest evidence relevant to this notional year comes from two very different kinds of archive: freshwater sediments sealed beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh, and animal bones recovered from limestone caves, especially at Castlepook near Doneraile in north County Cork. Together, they suggest a harsh but ecologically varied land, intermittently ice-free, where animals moved through open country and where a human visit is possible but far from demonstrated as a settlement.

Dating a Calendarless Landscape

The chronological problem matters. Radiocarbon results are expressed in radiocarbon years before present and must be calibrated against changing atmospheric carbon levels to estimate calendar ages. At these great ages the uncertainties are substantial. The organic Derryvree deposit produced the conventional radiocarbon determination BIRM-166, 30,500 ± 1,100 radiocarbon years BP. Later

modelling has placed this evidence for ice-free conditions at about 33.5 ± 1.2 thousand calendar years BP: broadly around 34,700–32,300 cal BP. That span overlaps the approximate calendar position represented by 31,099 BCE, but it does not identify a season, generation or historical occurrence.

The deposit is especially valuable because its stratigraphy is clear. Road works in 1969 cut through a Fermanagh drumlin and exposed freshwater silts and fine sands between two distinct sheets of glacial till. The lower and upper tills record separate episodes when ice moved across the ground. Between them lay sediments formed where liquid water, plants and small animals existed. Derryvree is thus direct evidence against imagining every part of Ireland as continuously entombed beneath ice throughout the later Ice Age. It does not mean that the whole island was warm, wooded or hospitable; it demonstrates a local environmental interval within an unstable glacial world.

A Fen Beneath the Ice

Pollen, plant macrofossils and insect remains from Derryvree recover a surprisingly precise ecological outline. The vegetation was predominantly open and tundra-like, rather than forest. Sedges, grasses, dwarf shrubs and cold-adapted herbs occupied wet and exposed ground. The record includes mountain-avens, dwarf willow, juniper, clubmosses and bogbean (*Menyanthes trifoliata*), while aquatic and marginal plants indicate shallow fresh water and marshy margins. Mosses and insect evidence add to the impression of a wetland mosaic: pools, seepage, muddy shores and vegetated ground within an otherwise cold, windswept landscape.

This was not barren terrain. In summer, low vegetation could provide forage and nesting cover; in winter, frost, snow cover and scarce daylight would have imposed severe constraints. Trees were absent or negligible locally. There is no evidence for cultivated crops, managed pasture, clearance, fields or domestic livestock. The people who later transformed Irish landscapes through farming were more than twenty-five millennia in the future. Derryvree's importance lies precisely in its modest scale: a buried patch of freshwater habitat preserves organisms that would otherwise have vanished beneath later ice and sediment.

Ice, Water and a Changing Coast

At about this point in the Late Pleistocene, climate across the North Atlantic was capable of sharp shifts. Ice sheets were growing and reorganising, but the maximum expansion of the last Irish Ice Sheet came later, broadly within the period c. 27,000–23,000 calendar years BP, with details varying regionally and remaining debated. The later ice would scour, bury and rearrange much of Ireland's surface record. That destructive history helps explain why evidence for an earlier human presence is so scarce: open-air camps, wooden structures and lightly used hunting places would have had little chance of survival.

Sea level was markedly lower than today because water was stored in continental ice sheets. Ireland's shoreline therefore extended beyond many modern coasts, and plains now submerged beneath the Atlantic and Irish Sea formed part of the wider landscape. Yet lower sea level should not automatically be translated into a simple land bridge or an easy route for people. The precise geography of coasts, channels, glaciers and seasonally dangerous waters changed through time. No excavated route, boat or crossing place from this period has been found in Ireland. Any movement of animals or people must remain an inference from broader north-west European geography, not an established Irish journey.

Reindeer, Hyenas and Cave Archives

Irish cave deposits and older collections demonstrate that Late Pleistocene Ireland supported a richer large-mammal fauna than the modern island. Reindeer are especially relevant to open, cold-country environments. Other fauna documented in Irish Quaternary records include woolly mammoth, giant deer, horse, brown bear, wolf, Arctic fox, lemming and spotted hyena. Not every species was necessarily present in the same district or century, and cave assemblages often mix remains accumulated over long periods. A cave is not a census of one living landscape. Bones may have arrived through carnivore activity, natural deaths, water movement or excavation disturbance.

Castlepook Cave, also known historically as Mammoth Cave, illustrates both the promise and limitation of this evidence. Its animal remains were recovered during antiquarian excavations, principally in the early twentieth century, before modern recording standards. A reindeer femur from the collection has been publicly reported as approximately 33,000 years old and to carry a deep mark interpreted as stone-tool damage made during carcass processing. If that diagnosis and chronology are upheld by continuing work, the bone may indicate that a person handled a reindeer in Ireland at a time relevant to this article.

The Human Question

The Castlepook femur is potentially momentous, but it cannot bear more weight than it contains. One marked bone is not evidence for a village, an enduring population, a named culture or a political territory. It cannot tell us whether people killed the animal, found it already dead, removed meat or hide, broke the carcass elsewhere, or lost a processed fragment that later entered the cave. Nor does it establish a precise date for the mark itself. There is no securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or repeated butchery area from Ireland at around 31,099 BCE.

The broader European comparison is informative only at a general level. Elsewhere in north-west Europe, Upper Palaeolithic *Homo sapiens* groups made stone tools, exploited animal resources, used hides and maintained social connections across considerable distances. Such practices make a brief Irish visit conceivable. They do not prove that a comparable community was resident in Ireland. The better-established Irish evidence for human activity is much later: a butchered bear bone from Alice and Gwendoline Cave in County Clare dates to 12,810–12,590 cal BP, while more sustained settlement belongs to the post-glacial world. The gap is a warning against filling a sparse record with an imagined population.

No Politics, No Proven Trade

Political affairs, diplomacy and organised conflict cannot responsibly be described for Ireland at this date. There are no names, boundaries, forts, monuments, weapons assemblages or settlement hierarchies. Equally, there is no evidence of trade in the later sense: no imported tools, exchange goods or established sea routes can be assigned to this period. If people reached Ireland, their economy would most plausibly have depended on highly mobile hunting, scavenging and gathering in a seasonal landscape, but that is an interpretation drawn from comparable Upper Palaeolithic lifeways rather than a directly excavated Irish household.

Religion, language, music, art and learning are beyond recovery here. The absence of evidence is not evidence that people lacked beliefs, stories or technical knowledge; it means that Ireland has yielded no material traces through which such matters can be studied for this interval. The appropriate historical emphasis is environmental survival and evidential restraint. Derryvree shows that cold-age Ireland contained freshwater wetlands and plant life between phases of glaciation. Castlepook raises the serious possibility that people encountered its reindeer. Between those statements lies a vast space that archaeology cannot yet fill.

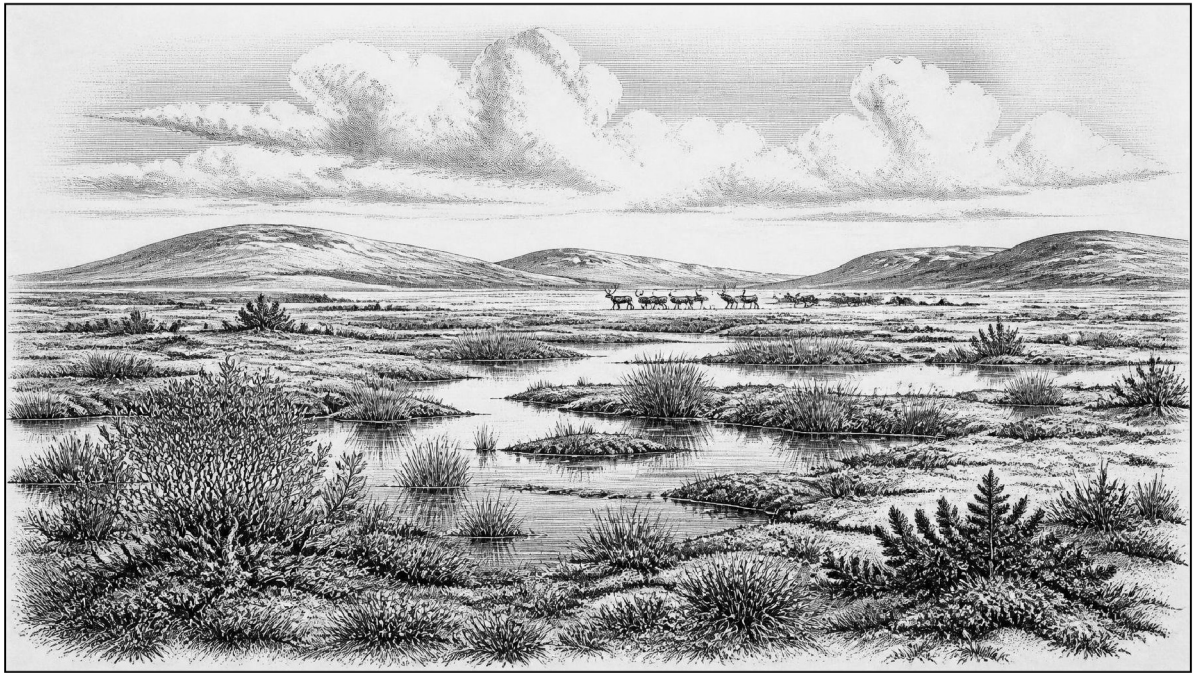
A Fragile Window

For 31,099 BCE, Ireland appears not as an empty stage but as a difficult, changing environment whose evidence has survived by accident. A silt bed beneath a drumlin records sedges, bogbean and shallow water; cave collections preserve the bones of animals moving through open country; a single marked femur invites, but does not settle, a profound question about human presence. Later ice would reshape the island and erase much of what had existed. The history of this notional year is therefore not a story of kings or communities. It is the story of a brief scientific window onto an Ice Age Ireland that was alive, cold, mobile and largely beyond the reach of calendar history.

Chapter 003 of 100

31098 BCE

Derryvree's Dwarf-Willow Wetland^[3]



A Date Without a Diary

Modern calendar-year precision is not available for Ireland in 31,098 BCE. No community on the island kept a calendar, wrote an account, or left an archaeological sequence capable of identifying a particular twelve-month span so far back. The date is a modern conversion, approximately 33,047 years before AD 1950, the conventional reference point for radiocarbon dating. At this depth in time, the responsible unit is a calibrated range, not a named year or an event.

The date falls within the Late Pleistocene, during Marine Isotope Stage 3, a long and climatically unstable part of the last Ice Age. It preceded the local maximum of the last British–Irish Ice Sheet by several millennia. Ireland was not simply an island smothered continuously by ice, nor a familiar green landscape awaiting settlement. Conditions changed sharply between regions and over long spans of time; advancing ice, exposed ground, frost action, wetlands and open animal country all formed part of the picture. The record is fragmentary because later glaciers eroded, buried and rearranged much of what had existed.

The most useful Irish evidence for the broad interval embracing this nominal date comes from an unlikely source: a buried organic deposit exposed in a road cutting at Derryvree, near Maguiresbridge in County Fermanagh. It is an environmental archive, not a settlement. Its value lies precisely in showing what kinds of plants, insects and waters could persist in an ice-age Ireland, while also marking the limits of what historians can claim about people.

Waterlogged Ground Between Ice Advances

At Derryvree, workers cutting through a drumlin in 1969 exposed organic silts sealed between two layers of glacial till. The lower and upper tills record separate episodes in which ice moved across the locality; between them lay sediments formed when the ground was not overridden by glacier ice. The deposit produced a conventional radiocarbon age of about 30,500 radiocarbon years BP. Later discussion has expressed that result as a broad calibrated interval of roughly 36,900–31,700 calendar years BP. The nominal year considered here sits towards the younger end of that published range, not at a point that can be fixed more closely.

This distinction matters. A radiocarbon determination dates organic material, subject to laboratory uncertainty and calibration; it does not label an annual political or environmental episode. Nor should the Derryvree bed be treated as a photograph of all Ireland. It describes a local Fermanagh basin during an ice-free interval, preserved by exceptional circumstances beneath later deposits. Yet it is among the clearest direct windows into the island's terrestrial environment at this depth of time.

Pollen, plant macrofossils, spores and insect remains point to an open, treeless tundra or muskeg landscape. Sedges and grasses were prominent. Fossil evidence includes dwarf willow, juniper, mountain-avens, lesser clubmoss and the bog plant bogbean. Mosses grew around wet ground, while pools held aquatic life. Such evidence indicates that plants found today in upland, Arctic or sub-Arctic settings could once thrive at much lower elevations in Ireland. It also suggests a mosaic rather than a uniform wasteland: saturated ground, shallow freshwater, mossy margins and open herb-rich terrain lay close together.

The interpretation of climate is necessarily broader than a weather report. The flora and beetles support cold conditions, severe winters and short growing seasons, with repeated freezing and thawing shaping soils and slopes. The absence of a closed forest is important. Trees may be represented by long-distance pollen, but the local vegetation was not woodland. Derryvree instead preserves an environment in which low plants took advantage of brief summers and wet hollows, while exposed ground remained vulnerable to wind and frost.

An Island Before the Great Expansion

The Derryvree evidence complicates any simple claim that Ireland was wholly glaciated at this time. It demonstrates that north-central Ireland was ice-free when the organic bed accumulated. Geological reconstructions nevertheless show that the wider British–Irish Ice Sheet was growing during the period around and after 31,000 years ago. By the local Last Glacial Maximum, broadly between about 26,000 and 20,000 years ago, ice covered much of Ireland and extended onto surrounding shelves. The timing, thickness and routes of that expansion varied markedly from one sector to another.

Thus 31,098 BCE belongs to a transition, not a single climatic tableau. In northern Fermanagh, a cold wetland could support a distinctive plant and invertebrate community. Elsewhere, ice masses, high ground, coastlines and river systems may have followed different histories. Ice-sheet research can map major landforms and constrain broad phases, but it cannot yet produce a definitive island-wide map for this individual modern calendar year. It is safer to speak of changing habitats and increasing glacial influence than of exact coastlines or provincial zones.

Sea level was lower globally than today because much water was locked in continental ice sheets. That fact altered the Irish Sea basin, but it does not prove that a straightforward, permanent land bridge joined Ireland to Britain or continental Europe at this moment. Ice margins and marine passages changed

repeatedly, and many former lowlands now lie beneath the sea. Any discussion of travel must therefore remain conditional. The geography created opportunities and barriers whose exact combination is still difficult to reconstruct.

Castlepook's Animal Evidence

More than 300 kilometres south of Derryvree, Castlepook Cave near Doneraile in north County Cork preserves Ireland's richest known late Pleistocene vertebrate collection. Early twentieth-century excavation recovered a very large but imperfectly documented body of bone, later studied and redated by the Irish Quaternary Fauna Project and subsequent researchers. The cave has yielded remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena.

Several Castlepook specimens have radiocarbon ages that fall within the wider Marine Isotope Stage 3 interval, including reindeer, mammoth, giant deer, brown bear and hyaena. The assemblage establishes that large grazers and browsers, together with formidable predators and cold-adapted small mammals, reached southern Ireland during the later Ice Age. It supports the wider inference from Derryvree that parts of Ireland could, at times, sustain open-country ecosystems rather than continuous forest or universal ice cover.

But a cave bone assemblage is not a census. Carnivores carried prey into caves; floodwater could shift bones; different chambers accumulated material at different times; and much excavation took place before modern recording standards. A list of species cannot be assumed to represent a single season or one simultaneously living community. Castlepook is especially significant because of its richness, but its complicated formation history requires caution in every reconstruction.

Spotted hyaena is a striking example. Its bones, coprolites and tooth-marked prey remains indicate that Castlepook served, at least during some phases, as a hyaena den or feeding place. Mammoth and giant deer need not have lived beside every reindeer, bear or lemming represented in the collection. What the site securely reveals is ecological possibility across a long span: cold, open habitats could support varied herbivores and carnivores in Ireland before the ice sheet's fullest expansion.

People: A Question, Not a Population

No securely excavated camp, hearth, dwelling, stone-tool assemblage, burial or settlement is known from Ireland around this date. Consequently, there is no sound basis for describing an Irish population's language, family arrangements, clothing, artistic practices or seasonal routine in 31,098 BCE. There are likewise no recoverable political affairs: no rulers, states, borders, treaties, warfare or diplomacy can be assigned to the island. Farming, formal trade and monumental religion belong to much later Irish prehistory.

A reindeer femur fragment from Castlepook has been proposed as bearing a chop mark made during butchery and has attracted understandable attention as a possible sign of Upper Palaeolithic human activity around 33,000 years ago. If future analysis confirms that interpretation, it would suggest that people reached Ireland and processed an animal during this broad period. It would still not demonstrate permanent settlement, a local technological tradition or continuous occupation. The specimen comes from an old collection, without an associated stone-tool assemblage or an undisturbed occupation surface, so the mark and its context require continuing specialist scrutiny.

The firm published evidence for human activity in Ireland remains much later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave, County Clare, dated to about 12,810–12,590 calibrated years BP. That gap is essential context. Ireland around 31,098 BCE may have been visited by people, but it cannot responsibly be populated with an established society merely because humans elsewhere in Upper Palaeolithic Europe hunted, travelled, made art and maintained social ties.

Deep History, Carefully Told

The economy visible in the evidence is ecological rather than human. Wetland plants fixed carbon in Fermanagh mud; insects occupied pools and mossy margins; herbivores ranged through open country; hyaenas and other predators consumed carcasses in Cork. These are evidence-based statements. A human hunting economy, exchange network or maritime route is interpretation beyond what the Irish record can presently support. Even the possibility of an early human incursion is best treated as a research question rather than a settled chapter of national history.

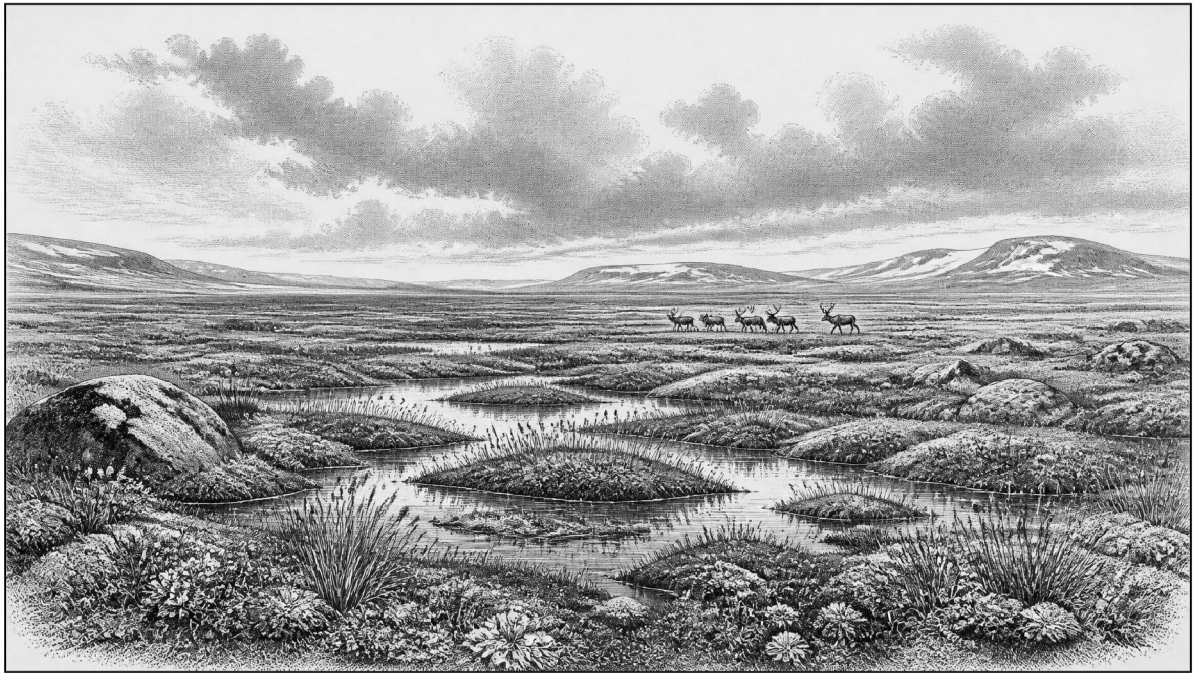
Religion and learning are similarly beyond recovery. The Derryvree plants and Castlepook bones have no testimony to beliefs, stories, ritual places or inherited knowledge. That silence should not be mistaken for an absence of culture among any people who may have visited; it reflects the absence of securely attributable archaeological remains. The material record is better at preserving mud, pollen and bone than intention, speech or memory.

What survives from this approximate time is nevertheless important. Derryvree records a functioning, cold-climate freshwater landscape between glacial advances. Castlepook shows that impressive mammals and their predators found routes into Ireland's far south-western edge of Europe. Together they replace a blank, frozen caricature with a more exact image: an environmentally varied land, increasingly threatened by advancing ice, rich in local ecological detail, and still almost beyond the reach of human history.

Chapter 004 of 100

31097 BCE

Cork's Marked Reindeer Bone^[4]



The label “31,097 BCE” is a modern way of locating a remote point in deep prehistory, not a date preserved by any Irish community. There was no written calendar, named ruler, settlement record or event chronology from which an occurrence in this particular year could be recovered. In calendar arithmetic it lies roughly 33,046 years before AD 1950, the conventional “present” used in radiocarbon reporting; but that does not turn it into a radiocarbon date. For Ireland at this depth of time, responsible history works with broad calibrated ranges, stratigraphic sequences and changing environments. The closest evidence therefore illuminates a span of centuries or millennia around the notional year, rather than a single day or season.

A Middle Midlandian Landscape

About this time Ireland formed part of the Late Pleistocene world, within Marine Isotope Stage 3 (MIS 3), a long cold interval punctuated by abrupt climatic shifts. Irish Quaternary specialists have often used the regional term *Midlandian* for the last glacial cycle. This was not yet the fullest extent of the last British–Irish Ice Sheet, which developed later and reached major offshore limits in different sectors between roughly 30,000 and 22,000 years ago. Yet the distinction must not be mistaken for a benign age. Ice cover grew and retreated unevenly; local glacier margins, frozen ground, meltwater and harsh seasonal conditions made Ireland a highly varied landscape.

The best dated Irish environmental evidence relevant to this broad horizon comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks there exposed organic freshwater silts and sands trapped between two tills: deposits laid down by glacier ice. The sequence records, in order, an earlier glaciation, an interval when the locality supported freshwater sediments and vegetation, and renewed ice advance that buried and protected those remains. Organic material from the intervening bed has been

calibrated to approximately 36,900–31,700 years before present. That is a wide range, but it encompasses the broad timespan represented by 31,097 BCE. It does not prove that Derryvree looked precisely the same in that numbered year; it is a securely useful environmental bracket, not an annual snapshot.

The Derryvree remains indicate open, treeless tundra-like ground with wet hollows and shallow freshwater. Mosses, sedges, bogbean, lesser clubmoss and other cold-tolerant plants, alongside insects of northern aspect, point to a periglacial setting: land strongly affected by frost, thaw and short growing seasons near glacial conditions, but not necessarily buried beneath ice. Older descriptions compare the habitat with muskeg, waterlogged vegetation and pools interspersed with exposed ground. This evidence rules out the familiar later Irish scene of dense oak and hazel woodland, enclosed fields or permanent farmsteads. It cannot, however, supply a uniform map of the whole island. Fermanagh's buried wetland was a local environment, and Ireland's coasts, uplands and ice margins would have differed greatly from it.

Ice, Water and Connected Faunas

The most important regional development was climatic instability. Speleothems from Crag Cave in County Kerry show that calcite sometimes grew during later MIS 3 milder episodes. Because such growth requires liquid water moving through a shallow cave system, it independently indicates that periods above freezing occurred in south-west Ireland during the wider cold stage. The record is episodic rather than continuous, and it cannot identify the weather of 31,097 BCE. Its significance is larger: Ireland was subject to rapid North Atlantic swings between harsher stadial conditions and comparatively milder interstadials, not an unchanging "Ice Age winter".

Nor can modern shorelines be projected backwards. Lower global sea levels altered coastlines, and animals evidently reached Ireland repeatedly during the Late Pleistocene. How readily people or animals could move at any one moment depended on sea level, local topography, ice fronts and habitats, all of which changed. The fossil record demonstrates broad faunal connectivity with Britain and continental Europe over long periods; it does not license a precise reconstruction of a land route in this particular year. Recent genetic work on cave sediments from Castlepook is promising evidence for that wider connectivity, but it remains a preprint and should be treated as provisional rather than as the final word.

Castlepook's Cave Fauna

In north County Cork, Castlepook Cave near Doneraile—historically also called Mammoth Cave—provides the most evocative evidence for southern Ireland in this part of the Late Pleistocene. Antiquarian excavations and later investigation recovered bones of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. The assemblage makes clear that Ireland supported, at different times within the long cold stage, animals associated with open country and cold climates. It is powerful evidence against any assumption that the island was always completely sterile beneath ice.

But a cave collection is not a census of one living landscape. Castlepook's deposits were excavated in the early twentieth century, before present-day standards of excavation, sediment recording and microscopic analysis. Bones may have accumulated through many episodes, been moved by water or carnivores, or been disturbed during excavation. Improved radiocarbon methods have also shown that some earlier Irish cave dates were too young: re-dating at Castlepook shifted certain animal remains thousands of radiocarbon years older and suggested that giant deer and spotted hyaena may have

disappeared locally before about 40,000 calibrated years ago. Thus a list of species from the cave cannot be presented as a single herd-and-predator scene in 31,097 BCE. It establishes a changing regional fauna, not a perfectly contemporaneous ecosystem.

The named animal most closely associated with this article's date is a reindeer femur from Castlepook. Public reporting in 2021 described it as about 33,000 years old and identified a deep linear mark as possible evidence of processing with a sharp stone implement. If that interpretation is confirmed by fuller publication, contextual assessment and further finds, it would be remarkably early evidence for human activity in Ireland: perhaps a brief Upper Palaeolithic visit in which a reindeer carcass was butchered. It would not show an established population, village or ethnic community. One modified bone cannot establish how many people arrived, how long they stayed, whether they returned, or whether they crossed from Britain, the continent or another direction.

The qualification matters because the femur is not accompanied by a securely excavated hearth, tool assemblage, dwelling floor, burial or repeated occupation horizon. The 2022 archaeological work at Castlepook was undertaken partly to establish whether intact Pleistocene deposits survived after the older excavations. It confirmed the cave's importance but also demonstrated the difficulty of separating ancient deposits from later disturbance and modern material. The marked reindeer bone is therefore best understood as a serious research question and a potentially transformative trace, rather than proof of a settled Ireland 33 millennia ago.

People Without a Political History

No political affairs, diplomacy, chiefs, territorial boundaries or warfare can responsibly be described for Ireland around this point. There are no contemporary human remains, monuments, inscriptions or settlements from which social organisation could be reconstructed. If people did reach the island, their likely concerns were immediate mobility, shelter, fuel, weather, animal movements and food. Reindeer could have offered meat, fat, hide, sinew and bone; that is a general inference from hunter-gatherer economies, not a demonstrated description of a Castlepook group. There is no evidence for farming, livestock, crops, markets, long-distance trade networks or a permanent local economy.

The same restraint applies to religion, culture and learning. Ireland has yielded no securely dated cave art, ceremonial site, musical object, house or stone-tool industry for 31,097 BCE. It would be wrong to fill the silence with imagined beliefs or rituals merely because Upper Palaeolithic peoples elsewhere made art and maintained rich cultural traditions. Such wider European parallels show what was possible, not what happened in Ireland. At most, the possible cut-marked femur suggests technical knowledge of sharp stone tools and carcass processing; even that conclusion remains dependent on the interpretation of the mark.

What the Silence Means

The scarcity of evidence is itself historically important. Later glacial advances eroded and buried soils, land surfaces and shallow campsites across much of Ireland, while sea-level change removed or submerged former coastal landscapes. Caves and sediments sealed beneath till are unusually valuable precisely because they sometimes escaped that destruction. Absence of known camps is not proof that no person ever entered Ireland in MIS 3, but neither does it prove a settled population. The strongest account of 31,097 BCE is therefore environmental: a cold, unstable island or near-island landscape, with locally ice-free tundra wetlands, shifting ice margins and a fauna that included reindeer at some stage of the wider interval.

That setting gives the Castlepook femur its importance. It is not the beginning of a documented Irish nation, nor evidence for continuous occupation leading straightforwardly to later prehistoric communities. It is a fragment from a world repeatedly remade by climate and ice. Alongside Derryvree's freshwater silts and Crag Cave's mineral growth, it shows that the history of Ireland at this date lies in sediments, bones, plants and dating ranges—evidence sufficient to recover a changing Pleistocene environment, but not sufficient to invent an event for one exact year.

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31096 BCE

Maguiresbridge's Frozen Reedland^[5]



The label 31,096 BCE is a modern filing device, not a date at which an event in Ireland can be placed. Nobody on the island recorded years, and archaeology cannot identify a particular season, journey or human lifetime so far back. In conventional calendar terms, the label falls roughly 33,000 years before AD 1950, within the later part of the Pleistocene and Marine Isotope Stage 3. What can responsibly be written is therefore a history of evidence: buried sediments, fossils, cave deposits and the later action of ice. Their dates are ranges, their geographical reach is limited, and their interpretation remains open to revision.

Dating a Landscape, Not a Year

The closest detailed Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a sequence within a drumlin: organic freshwater silts and fine sands lay between two substantial sheets of till, the unsorted debris deposited by glacier ice. The organic material yielded the conventional radiocarbon determination BIRM-166, 30,500 radiocarbon years before present, with a considerable uncertainty of +1,170 and -1,030 years. Later publications have expressed its calibrated range broadly as about 36,900–31,700 calendar years before present. The modern label 31,096 BCE sits within that broad span, but this does not mean that the deposit formed in that one year. It represents conditions accumulated over a long interval and dated by a technique whose precision diminishes at such depth in time.

That distinction matters. Derryvree is not a national weather station, nor an annual diary. It demonstrates that, before renewed glaciation sealed the deposit beneath till, this part of north-central Ireland contained freshwater and supported a cold-climate biological community. It cannot prove that

every district of Ireland was ice-free at once, that the island had a uniform climate, or that the same plants and animals were present continuously throughout the dated range. The proper scale is a changing regional landscape at the margin of expanding and retreating ice.

Freshwater Beneath the Drumlin

The Derryvree silts preserve an unexpectedly rich assemblage of plant and animal remains. Mosses, sedges, dwarf willow and other low-growing plants point to open, treeless tundra or muskeg-like wetland rather than forest. Aquatic and wet-ground species, including bogbean, indicate standing or slow-moving freshwater in pools, shallow channels and saturated ground. Insects and other small remains reinforce the picture of severe, continental conditions, although not a lifeless polar desert. During the brief productive season, plants colonised exposed sediment and wet hollows; during the long cold season, frost, snow, wind and frozen ground would have dominated.

The scene should not be imagined as a uniform blanket of marsh. A periglacial environment is a mosaic. Fine sediment accumulated in quiet water, while nearby slopes and exposed ridges could have been dry, stony and vulnerable to frost action. Dwarf shrubs and herb-rich patches may have occupied better-drained ground; sedges and mosses flourished where meltwater collected. Such habitats could sustain insects, small mammals and grazing animals, yet they were fragile and readily transformed as climate, drainage and ice margins changed. The later glacier did more than cover this wetland: it compressed the evidence into the body of a drumlin and removed or reworked much of the surrounding landscape.

Before the Ice-Sheet Maximum

At this horizon Ireland was within the last glacial cycle, but it was not yet at the best-established maximum of the last British–Irish Ice Sheet. Modern reconstructions place the ice sheet's greatest overall volume at about 23,000 years before present, while recognising that maximum extent and advance differed greatly between sectors. Research also indicates earlier growth, retreat and readvance during Marine Isotope Stage 3. The record is therefore incompatible with an old simple picture in which Ireland was either entirely frozen or entirely open country for a single uninterrupted Ice Age.

Derryvree is important precisely because it preserves evidence of an ice-free interval between glacial deposits. Similar pre-maximum evidence from northern Ireland and elsewhere has helped demonstrate that ice-sheet history was dynamic. Yet the exact limits, thickness and timing of individual ice masses remain debated, particularly for the earlier part of the last glaciation. A responsible reconstruction for around 31,096 BCE is consequently cautious: some Irish terrain was capable of supporting freshwater wetlands and tundra vegetation during the broad Derryvree interval, while glaciers were already a decisive force in the regional environment and would later advance across much of the island.

Animals and Open Country

Southern Irish caves provide a different kind of evidence. Castlepook Cave, near Doneraile in north Cork, has yielded one of Ireland's most significant Pleistocene faunal collections. Reindeer, woolly mammoth, giant deer, brown bear, wolf and spotted hyaena are among the animals associated with the wider cave record, although their remains do not all belong to one moment or one identical habitat. Recent redating has shown that several older cave chronologies require revision and that some fauna belongs

much earlier in Marine Isotope Stage 3 than previously supposed. A cave assemblage is also a selective archive: carnivores may drag in prey, animals may die naturally, and water, excavation practices and later disturbance can mix deposits.

Even with those cautions, the fauna makes an important point. Ireland was not ecologically isolated in the absolute sense implied by its modern sea boundaries. Lower global sea level exposed large areas of the continental shelf, and animal movement between Ireland, Britain and mainland Europe was at times more feasible than it is now. The routes, coastlines and water barriers changed repeatedly, however; no single land bridge can simply be assumed for every date or species. Reindeer and mammoth remains demonstrate that cold-open-country mammals reached Ireland, not that they formed stable herds everywhere on the island, nor that people followed them.

The Human Question at Castlepook

The possibility of human activity is the most arresting, and the least secure, part of this distant Irish history. A reindeer femur from Castlepook has been publicly described as carrying a deep mark consistent with cutting or chopping by a stone implement, and the animal bone has been associated with an age of roughly 33,000 years. If the mark was made by a person while the bone was fresh, it would suggest a remarkably early Upper Palaeolithic visit to Ireland: perhaps the processing of a reindeer carcass by a small mobile party.

That conditional wording is essential. The find is not a securely excavated occupation floor with stone tools, hearths, repeated butchery waste or human remains. The date of an animal's death is not automatically the date of a surface modification, and old cave collections often lack the stratigraphic control expected today. Marks on bone require specialist taphonomic assessment because trampling, carnivore damage, sediment abrasion and breakage can sometimes resemble deliberate modification. Nor is there yet a published settlement sequence at Castlepook that establishes an enduring population in Ireland at this time. The bone is a serious lead, not a licence to write a story of permanent colonisation.

No Politics, No Proven Trade

There is no evidence from around this horizon for political communities, leaders, diplomacy, warfare, territorial boundaries or organised religion in Ireland. There are no known houses, camps, graves, ornaments, artworks, monuments, written signs or locally attributable stone-tool industries securely dating to 31,096 BCE. It would be misleading to fill that silence with imagined clans, shamans, rituals or hunting expeditions.

The same restraint applies to economy and trade. If people did make a brief crossing, they would have required knowledge, planning and tools, but the Irish evidence does not reveal their route, social organisation, exchange networks or whether they returned. Animal movement and exposed shelf landscapes show potential connectivity; they do not demonstrate commerce. The best-supported account of everyday life is therefore ecological rather than social: wet ground, sparse vegetation, harsh winters, seasonal biological productivity and the recurrent disruption of ice.

What the Evidence Means

Ireland around the notional year 31,096 BCE was not an ancestral kingdom awaiting later historical actors. It was a physically unstable part of north-west Europe, repeatedly remodelled by climate and glaciation. At Derryvree, freshwater sediment preserves a cold wetland community that existed before ice again overran the site. At Castlepook, fossils reveal that large Ice Age mammals reached southern Ireland, while one marked reindeer bone raises an unresolved question about exceptionally early human presence.

Those records are fragmentary, but they are valuable precisely because they resist certainty. They show that Irish history at this depth begins not with rulers or chronicles, but with mud beneath a drumlin, bones in limestone caves and the difficult scientific work of establishing what each can, and cannot, tell us.

Chapter 006 of 100

31095 BCE

Derryvree's Mountain-Avens Basin^[6]



The label 31,095 BCE gives a useful point of reference, but it cannot identify a witnessed Irish event, ruler, community or season. This was the Late Pleistocene, tens of millennia before writing, farming or durable settlement evidence in Ireland. Modern calendar-year precision is not available for this period: the relevant dates are radiocarbon determinations calibrated into broad probability ranges. The year falls roughly 33,000 calendar years before AD 1950, within Marine Isotope Stage 3, a climatically unstable part of the last glacial cycle. What can responsibly be said comes from sediments, pollen, plant remains, insects, animal bones and the changing record of ice.

A Date Within a Range

The closest unusually detailed Irish archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed fine sands, freshwater silts and organic mud trapped between two thick deposits of glacial till. The sequence establishes a clear relative order: glacier ice had deposited one till; an ice-free freshwater environment subsequently developed; later ice laid down another till above it.

The organic horizon produced the conventional radiocarbon determination BIRM-166, 30,500 radiocarbon years BP, with a large published uncertainty. Using modern calibration, it has been placed broadly at about 36,900–31,700 calibrated years BP. The notional date of 31,095 BCE sits within that long interval, but it is not a date for the formation of the whole deposit, let alone a particular day in its history. Radiocarbon years and calendar years are not interchangeable, and calibration curves themselves are regularly refined. Derryvree is therefore evidence for conditions across a substantial span of time, not a time capsule stamped with one modern year.

The deposit is nevertheless exceptionally important. It demonstrates that this part of northern Ireland was not continuously covered by glacier ice during the interval represented by its freshwater sediments. It also supplies a rare, material record of the living landscape before the later growth of the British–Irish Ice Sheet transformed much of the island.

Wet Ground Beneath a Drumlin

Derryvree was not forested Ireland. Pollen, plant macrofossils, mosses and insect remains point instead to an open, treeless, periglacial environment: cold ground affected by freezing and thawing, with wet hollows, shallow pools and mossy or sedge-rich margins. The flora included grasses and sedges alongside plants associated with Arctic or alpine settings, notably mountain-avens (*Dryas octopetala*), dwarf willow, alpine clubmoss and bogbean. Water-milfoil and other aquatic remains indicate standing or slow-moving fresh water.

This combination matters. It rules out both a simple image of an unbroken ice sheet and the equally misleading picture of a mild, wooded refuge. Around the time represented by the deposit, at least one Fermanagh basin supported a cold freshwater mosaic: open water, saturated ground, low vegetation and exposed mineral soils. Summers may have allowed a brief but real burst of plant growth; winters were severe enough for periglacial processes to disturb soils and restrict trees.

That conclusion must not be extended mechanically to every valley and coast. Derryvree is a local archive. County Fermanagh's sheltered hollows, limestone geology and drainage differed from the uplands, Atlantic margins and southern lowlands. Yet its evidence is a vital correction to older generalisations about an empty, uniformly frozen Ireland. This was a country in which habitats could exist between episodes of glaciation, but where those habitats were vulnerable to climatic reversal.

Animals in the Cork Caves

The broader animal world is most vividly represented at Castlepook Cave, also known as Mammoth Cave, in the Awbeg valley near Doneraile in north County Cork. The cave deposits and collections include remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. This is not a single herd frozen in time. The bones derive from deposits accumulated over a long period, and much of the material was collected during early twentieth-century excavations, before the detailed stratigraphic recording expected today.

Even so, the fauna confirms that Ireland participated in the wider north-west European Ice Age animal world. Reindeer and lemmings imply cold, open habitats; wolves and foxes were predators and scavengers within that landscape; hyaena remains show that the cave could also have functioned as a carnivore den. Large mammals did reach the island or the landmass that would become Ireland. Their presence is direct evidence of ecological connection, though it does not reveal one simple route of arrival. Lower sea levels exposed more continental shelf than exists today, but the exact pattern of coastlines, water, seasonal ice and possible passages changed through time. It is unsafe to turn this into a claim of a permanent land bridge or an easy road from Britain or continental Europe.

The animal record also cautions against treating the Ice Age as a uniform age of extinction. The abundance and composition of fossils varied sharply with climate and preservation. A cave is especially selective evidence: animals may have died there, been carried in by predators, or entered through other natural processes. Castlepook tells us that a distinctive fauna was present in southern Ireland during the wider cold-stage interval; it does not provide a complete census of Irish wildlife in 31,095 BCE.

The Reindeer-Bone Question

Castlepook is also central to the question of people. A fragment of reindeer femur has been reported as about 33,000 years old and as carrying a deep incision interpreted by zooarchaeologist Ruth Carden as a cut made with a sharp stone tool during butchery. If that interpretation is sustained, it is potentially the earliest evidence of human activity in Ireland, far earlier than the securely established Mesolithic settlement of the island after the final retreat of the ice.

The conditional language is essential. The radiocarbon result dates the animal bone, not an exact moment when a mark was made. Identifying the incision as a stone-tool cut is a taphonomic judgement made from the bone surface; carnivore damage, trampling, sediment movement, excavation disturbance and later handling must all be considered. Nor has Castlepook yielded a securely associated hearth, stone-tool assemblage, dwelling floor, burial, occupation surface or group of repeatedly butchered animals from this age.

Accordingly, the bone cannot demonstrate a settled population, continuous occupation, a named people, language, ancestry or migration route. At most, and importantly, it raises the possibility that mobile Upper Palaeolithic hunter-gatherers briefly reached Ireland and processed a reindeer carcass. Such visitors may have been hunting, scavenging or moving through a much wider north-west European range. That is a plausible interpretation, not an established narrative. The National Museum of Ireland's more cautious summary still notes that no clear Palaeolithic human presence has yet been demonstrated.

Society Without a Settlement Record

There is no responsible basis for describing political affairs, diplomacy, warfare, chiefs or territories in Ireland at this date. No settlement, communal structure, weapon assemblage or human burial is securely known from the relevant interval. There is likewise no evidence for agriculture, livestock, pottery, metallurgy, monuments, formal shrines, writing, schools, markets or long-distance trade based in Ireland.

If people did visit, their everyday life would have depended on mobility, weather, freshwater, animal behaviour and access to fuel and shelter. The reported cut mark suggests carcass processing with a sharp implement, not a village economy. It cannot tell us how many people were present, whether they hunted the animal, how long they stayed, what they believed, or whether they returned. In this context, absence of evidence is not proof that every human activity was absent: later ice, erosion and rising seas have removed, buried or submerged many potential traces. But possibilities must not be written as facts.

Religion and culture are similarly beyond recovery. Cave use by carnivores is evidenced at Castlepook; ritual cave use by humans is not. The people who may have passed through were biologically modern humans living in an Upper Palaeolithic Europe rich in technologies, social relationships and symbolic practices, but no Irish object of this date demonstrates which traditions, if any, reached the island. Ireland's cultural history here is consequently a history of evidence rather than identity: a marked bone, uncertain in implication, beside a rich but non-human fossil assemblage.

Iceward Change

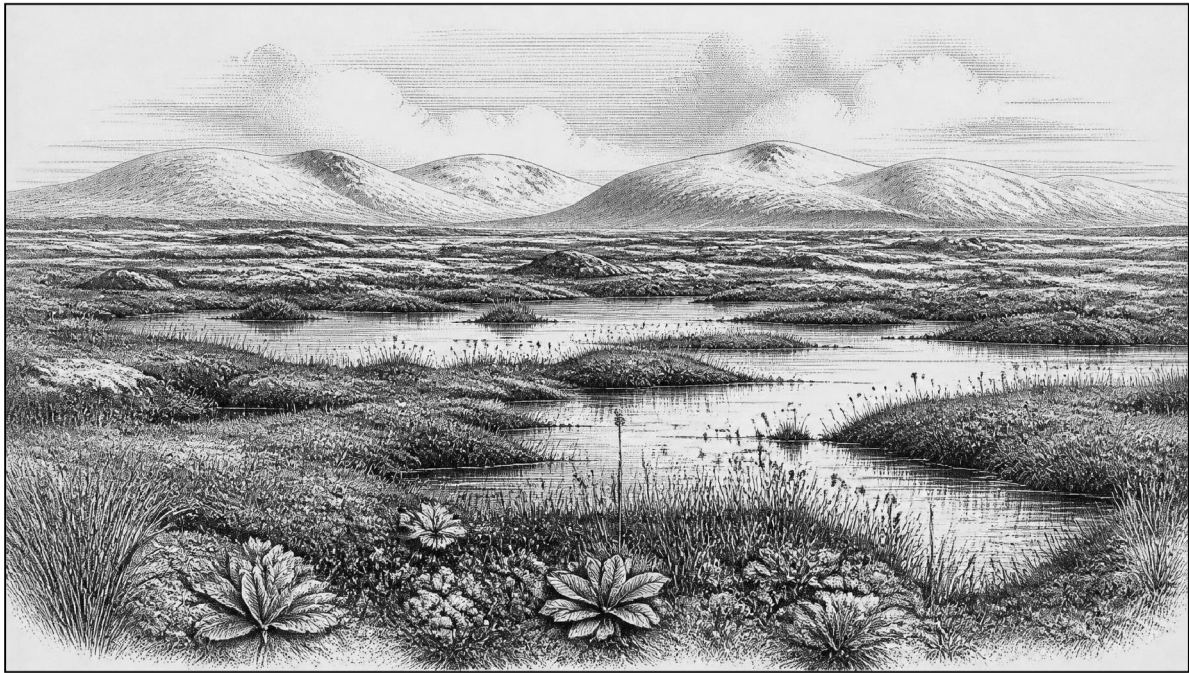
The principal development around this notional year was environmental. Derryvree records a cold wetland between glacial episodes; Castlepook records animals adapted to a variable open landscape; wider ice-sheet research shows that the best-established Last Glacial Maximum lay later, broadly after this period. Ice subsequently expanded across much of Ireland and the surrounding shelf, scouring terrain, redirecting drainage and entombing older deposits beneath till.

That advance had historical consequences even though it had no human chronicler. It contracted habitable ground, disrupted animal ranges and made any occasional human presence exceptionally precarious. It also shaped the archive available today: the Derryvree mud survived because later ice buried it, while the later remodelling of the landscape may have destroyed many other traces. For 31,095 BCE, then, Ireland's story is not of kingdoms or founding ancestors. It is the story of a mountain-avens and bogbean wetland beneath a future drumlin, Ice Age animals in a Cork limestone cave, and one contested reindeer incision that may preserve a fleeting human act.

Chapter 007 of 100

31094 BCE

Maguirebridge's Water-Milfoil Silt^[7]



The label 31,094 BCE is useful for arranging a modern chronology, but it cannot identify a known event, ruler, journey or community in Ireland. No written record, named person, political unit or calendar survives from this depth of time. Nor can archaeology place activity on a particular day or even securely within a single solar year. In radiocarbon terms, this notional year falls about 33,044 calendar years before AD 1950, within the later part of Marine Isotope Stage 3 and before the Last Glacial Maximum. The responsible approach is therefore to examine dated deposits whose calibrated ranges include or lie close to this point, and to distinguish what they demonstrate from what they merely make plausible.

A Date Within Broad Ranges

The most informative Irish sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed a remarkable sandwich of deposits: a lower glacial till, freshwater silts and fine sands containing organic remains, and a younger till above. The order is secure. Ice had covered the locality; subsequently, a waterlogged landscape accumulated sediment and plant and animal remains; later glacier ice overran and sealed it. The organic layer produced a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Modern calibration places it broadly around 36,900–31,700 calibrated years BP, or roughly 34,950–29,750 BCE.

Thus 31,094 BCE sits inside a wide calibrated interval associated with the Derryvree deposits, not at a precisely observable moment in their formation. The dated sample gives neither an anniversary for a pond nor a date for each seed, insect and sediment grain. Calibration curves themselves become less exact at such antiquity because atmospheric radiocarbon varied through time. Yet the range is sufficiently close to make Derryvree the best local environmental guide to Ireland around this notional year.

A Treeless Wetland in Fermanagh

Derryvree does not reveal a familiar green and wooded Ireland. Its plant remains, pollen and invertebrate evidence indicate an open, cold, periglacial environment. Periglacial means a landscape shaped by intense freezing and thawing at the edge of, or beyond, glacier ice: seasonally frozen ground, sparse vegetation, unstable wet soils and short growing seasons. Sedges, mosses and cold-tolerant herbs formed much of the cover. Fossil evidence includes bogbean (*Menyanthes trifoliata*), a plant of wet ground and shallow water, and alternate water-milfoil (*Myriophyllum alterniflorum*), an aquatic plant. These finds support the presence of pools, marshy margins or sluggish freshwater channels.

The scene was therefore a mosaic rather than a single uniform tundra. A shallow basin could have held open water and water plants while higher or better-drained ground supported low herbaceous vegetation. Dwarf willow and mountain-avens are among the kinds of cold-climate plants recorded from comparable Irish middle-glacial contexts. This is evidence for local habitats, however, not a licence to paint every hill and valley of Ireland alike. Derryvree was one protected freshwater setting in Fermanagh. Conditions in the limestone lowlands of Cork, the western seaboard and upland Donegal may have differed substantially.

The deposits also settle an important regional question. They prove that this part of Fermanagh was ice-free long enough for a freshwater ecosystem to develop between two episodes of glacial deposition. They do not prove that the whole island was ice-free. The build-up of the British–Irish Ice Sheet was under way on a regional and uneven basis after roughly 35,000–32,000 years ago; its broad maximum came later, conventionally placed around 27,000–21,000 years ago. Ireland at this time was changing, not standing at one neat boundary between “ice-free” and “glaciated”.

Castlepook’s Long Faunal Record

County Cork offers a different type of evidence. Castlepook Cave near Doneraile, also known as Mammoth Cave, is Ireland’s richest known archive for vertebrate life leading towards the Last Glacial Maximum. More than 2,000 bones have been recovered there, although the cave’s deposits were disturbed by water movement, carnivore activity and early excavations. Direct radiocarbon dates from individual bones span a long interval, approximately 45,700 to 19,950 years BP. The cave cannot therefore be read as a snapshot of one year, nor can all its species be assumed to have met one another.

Nevertheless, the fauna establishes that Ireland supported, at different points during this broad period, a formidable Pleistocene animal community. Castlepook has produced remains of woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with later Ice Age remains including Arctic fox, wolf and lemmings. Re-dating of Castlepook material using improved ultrafiltration methods showed that several older determinations had understated the true age of the bones by thousands of years. This revision has made the cave especially important for Marine Isotope Stage 3, while also warning against reliance on old dates obtained before modern pretreatment methods.

Near 31,094 BCE, a reindeer is the most evocative and relevant animal. Reindeer thrive in open country where lichens, grasses, sedges and herbs can be exploited. Their presence accords with the Derryvree picture of a cold, open landscape, but it does not establish a continuous herd in every Irish region. Mammoths and hyaenas likewise belong to the cave’s long record rather than a securely simultaneous local scene. The strongest conclusion is modest: Ireland was ecologically connected enough, at least intermittently, to sustain or receive cold-adapted mammals before the ice sheet reached its later maximum.

The Reindeer Bone and Human Possibility

Castlepook has also transformed discussion of the Irish Palaeolithic. A reindeer femur, recovered from the cave's historic collections, was reported in 2021 to carry a deep mark consistent with butchery by a sharp stone implement and to date to roughly 33,000 years ago. If the mark is correctly identified as human-made, it is potentially the earliest evidence of human action in Ireland by a very large margin. It would suggest that people reached the island, or its then changing north-west European margin, during the difficult climatic interval before the Last Glacial Maximum.

That claim needs careful wording. One modified bone is not a settlement. Castlepook has produced no securely associated hearth, worked-stone assemblage, dwelling floor, human burial or repeated concentration of butchered carcasses from this age. Its sediments and collections also have complicated histories. The bone may record a brief episode of carcass processing by a very small party rather than a permanent population. Nor can it identify whether the people involved were resident, visiting seasonally, or passing through a wider hunting range. The 2022 archaeological investigation at Castlepook located surviving cave sediments but recovered no cultural artefacts, underlining how incomplete the evidence remains.

Society Without Institutions

There is no evidential basis for kingship, tribal names, laws, diplomacy, organised warfare, trade routes or religious institutions in Ireland at this date. There are no monuments, graves, houses, ceramics, metalwork or artworks securely attributable to around 31,094 BCE. It would be misleading to project later Irish cultural traditions, languages or territorial identities into this world. Even the term "Ireland" is geographical shorthand for the landmass that would become the island, not a political community.

If the Castlepook modification proves anthropogenic, the minimum inference is practical knowledge: someone used a sharp-edged stone tool on fresh animal bone, probably while processing a carcass. Such a task could provide meat, marrow, hides, sinew and bone, but none of those outcomes can be demonstrated from the mark alone. Comparisons with Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe make small, mobile groups exploiting seasonal animal resources a reasonable interpretation, not an Irish fact. The archaeological record does not yet reveal their language, kinship, ritual, learning or artistic life.

Movement, Access and Survival

How mammals or people reached this land is equally unsettled. Lower global sea levels changed coastlines, but Ireland's relationship with Britain and the surrounding seas was governed by complex ice, sea-level and crustal movements. The faunal record proves that large mammals arrived during the wider Late Pleistocene; it does not specify their route in the year 31,094 BCE. Whether movement involved exposed ground, ice connections, narrow-water crossings or changing combinations of these remains a matter for palaeogeographical reconstruction. For people, no boats, landing places or routeways are known.

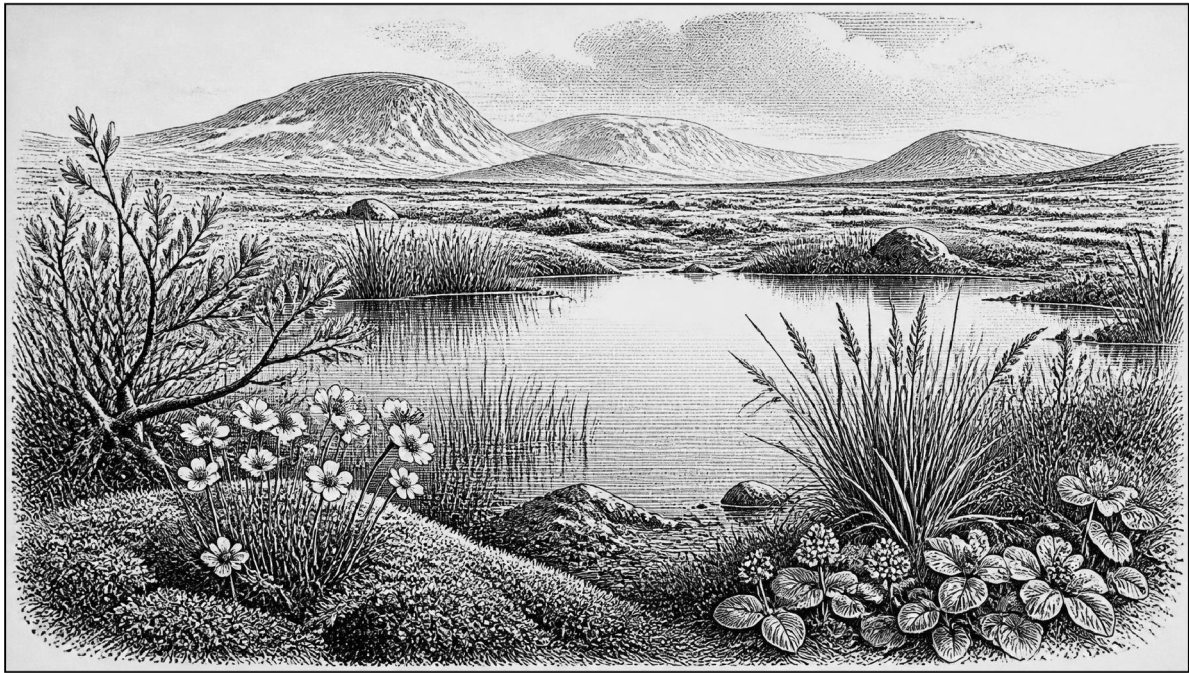
The chief development visible at this date is therefore environmental instability. Fermanagh's freshwater silt records an ice-free, wet, treeless interval, while the Irish glacial system was approaching a major expansion. Castlepook preserves evidence that large animals occupied or entered southern Ireland

during the wider period, and perhaps that humans handled a reindeer carcass. Soon afterwards, advancing ice would destroy, bury or render inaccessible much of the evidence that might have clarified the story. Around 31,094 BCE, Ireland's history is not one of states or settlements, but of fragile habitats, mobile animals and a tantalising human trace at the edge of a deepening Ice Age.

Chapter 008 of 100

31093 BCE

The Derryvree Bogbean Lens^[8]



Modern calendar-year precision is not available for Ireland in 31,093 BCE. No written chronology, annually layered Irish archive, settlement sequence or securely dated event can identify what happened in that particular year. The number is a modern label for a point roughly 33,000 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, an unstable phase of the last Ice Age. The responsible history is therefore one of broad calibrated ranges, sediments and fossils rather than rulers, battles or named communities.

A Date Within a Wide Range

The closest Irish environmental evidence is the Derryvree freshwater series near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed fine sands, silts and organic muds lying between two thick bodies of till, the unsorted debris deposited by glacier ice. The sequence is particularly valuable because it records a clear order: ice had previously occupied the locality; a non-glacial freshwater environment then developed; and later ice deposited the upper till that sealed the fragile organic bed.

Organic material from Derryvree produced the radiocarbon determination BIRM-166, 30,500 radiocarbon years before present, with a substantial uncertainty of +1,170 and -1,030 years. A radiocarbon age is not identical to a calendar age, especially so far back. Published calibration places the deposit broadly around 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. The modern label 31,093 BCE falls inside that broad interval, but it cannot be assigned to a particular day, season, generation or layer of the deposit. Derryvree is an environmental archive accumulated over time, not a diary.

Fresh Water Between Ice Advances

What Derryvree directly demonstrates is local ice-free ground and freshwater sedimentation during a cold stage. Its fossil plants, mosses, pollen and insect remains indicate open tundra or muskeg: wet, treeless ground with pools, waterlogged vegetation and a short productive season. Sedges and grasses were important components, while dwarf willow, mountain-avens, bogbean and aquatic water-milfoil signal a mosaic rather than a featureless frozen plain. Moss-rich margins and shallow open water would have made the site locally varied even under severe climatic conditions.

The evidence supports hard winters, cool summers and periglacial processes such as repeated freezing and thawing. It does not show a mild Irish landscape. Nor does it prove that every part of the island was free of ice at once. Derryvree was a local basin in what is now Fermanagh, and conditions could have differed sharply across uplands, coasts and regions closer to active glacier margins. Yet the bed is important precisely because later glaciation erased or buried so much evidence. It preserves a rare glimpse of Ireland before the full expansion of the last British–Irish Ice Sheet.

At this point in the wider glacial cycle, ice growth was neither a single island-wide event nor a simple advance from one direction. Successive ice masses altered drainage, stripped older soils and reshaped relief. The drumlins of northern Ireland belong to that long glacial inheritance, though a drumlin visible today cannot be treated as a landscape preserved unchanged from 31,093 BCE. The Derryvree deposit instead captures an interval between episodes of glacial occupation, later enclosed within the landform.

The Animals of Cold-Stage Ireland

Southern Irish caves provide a complementary, though complicated, picture. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork has yielded one of Ireland's richest Pleistocene faunal collections. Its remains include woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena. Taken together, these animals show that Ireland was intermittently accessible to a much richer cold-stage fauna than survives on the island today.

The cave collection must nevertheless be read cautiously. Much was recovered in antiquarian excavations, rather than from modern, continuously recorded layers; bones could have been moved by carnivores, water, digging and later disturbance. Direct radiocarbon dating has also shown that the material does not represent one short episode. Reassessment of Castlepook and other southern Irish cave assemblages has pushed some earlier results substantially further back, underlining that a cave is a time-depth accumulation, not a snapshot of a single local herd.

Spotted hyaena is especially revealing. A hyaena den, scavenging site or carnivore-visited shelter can collect and modify bones in ways that resemble a human food deposit if examined without context. Its presence at Castlepook also makes clear that predator and prey relationships, rather than human affairs, form the best-attested conflict in Ireland's record at this depth of time. Reindeer, mammoths and giant deer moved through landscapes in which food, exposure, snow cover, predators and changing routes all mattered.

The Human Question at Castlepook

A reindeer femur from Castlepook has given this era unusual archaeological significance. The bone bears a deep mark interpreted by zooarchaeologist Ruth Carden as possible damage from a stone tool during carcass processing, and it has been reported as dating to around 33,000 years ago. If that interpretation is sustained, it would indicate a very early human visit to Ireland, far earlier than the island's formerly accepted evidence for occupation.

It is not, however, evidence for a settled population. No securely associated stone-tool assemblage, hearth, dwelling, burial, human bone, occupation surface or repeated domestic refuse of comparable age has been recovered at Castlepook. The mark cannot presently establish whether people killed the animal, encountered a carcass, removed meat, hide or sinew, or briefly passed through an area also used by carnivores. A responsible reading is that the bone raises a serious possibility of transient human activity; it does not establish an Irish village, territory or continuous Palaeolithic community.

Society Without a Social Record

For political affairs, diplomacy and organised warfare, the evidence is silent. There are no names, languages, boundaries, graves, monuments or artefacts from which to reconstruct institutions or beliefs in Ireland at this date. Likewise, no Irish evidence supports claims about ritual, art, formal religion, clothing styles, kinship rules or trade networks. The absence of such evidence is not proof that no people ever entered the island, but it does set limits on what can responsibly be said.

If the Castlepook mark records human butchery, the least speculative inference is a brief encounter between a small mobile party and a reindeer carcass, using a sharp stone edge. Such visitors would belong broadly to the Upper Palaeolithic world known elsewhere in north-west Europe, where people relied on flexible movement, detailed knowledge of animals and seasonal landscapes, and portable equipment. That wider comparison can explain what was possible; it cannot fill Ireland with unobserved camps, alliances or migrations.

Movement, Coasts and Connections

Lower global sea levels changed the shape of the Irish Sea world. Coastlines lay farther from their present positions, and the shelf, channels and sea crossings differed from those familiar today. These changes helped make faunal arrivals possible at various times, but they do not by themselves demonstrate a permanent dry-land route, nor do they prove human movement on any particular route in 31,093 BCE. Animal dispersal and human travel must be assessed separately.

There is similarly no basis for describing an economy in the later prehistoric sense. There was no farming, metalworking, market exchange or permanent field system. The demonstrable economy of the landscape was ecological: plants grew in brief seasons; herbivores converted them into mobile biomass; predators and scavengers followed; freshwater pools concentrated life in a cold open country. Any human subsistence activity remains hypothetical except for the limited possibility suggested by the marked Castlepook bone.

An Ice-Age Landscape, Not a Recorded Year

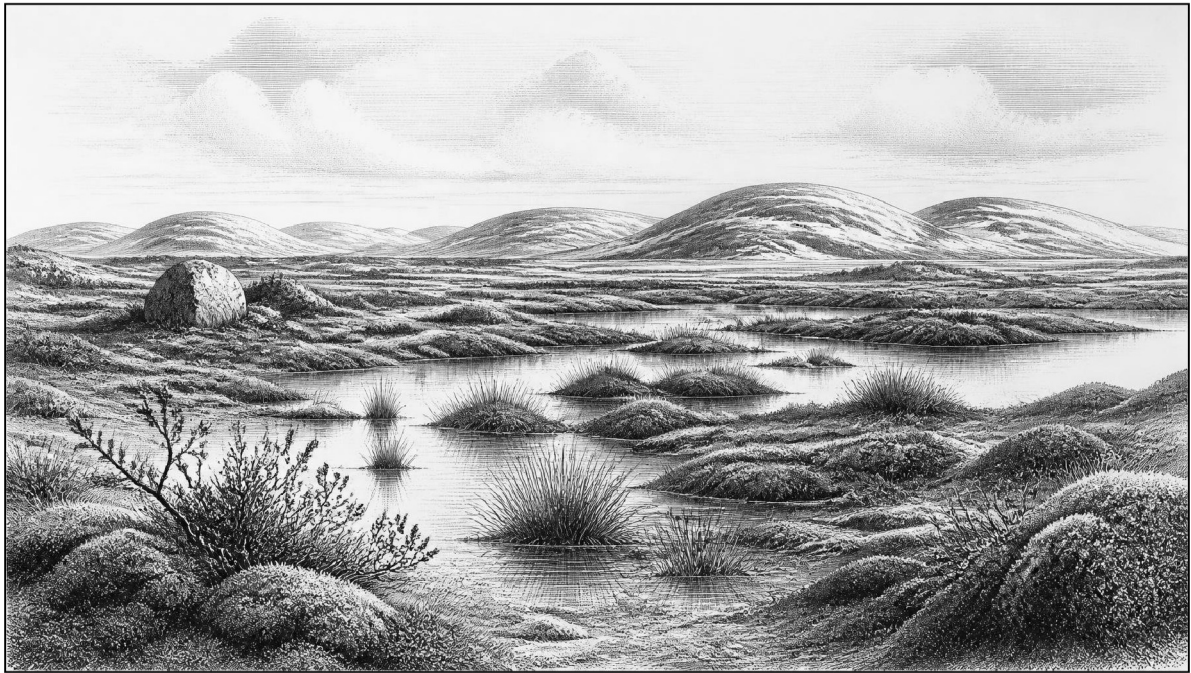
The most important development illuminated by this date is not a single event but an interval of environmental possibility. Around the broad Derryvree range, parts of Ireland could support cold, wet tundra habitats between glacial episodes. Those habitats contained distinctive plant communities and formed part of a wider north-west European world in which reindeer, mammoths, hyaenas and other mammals sometimes reached Ireland. The island was neither timelessly buried beneath ice nor securely known to be inhabited.

Thus 31,093 BCE should be understood as a carefully placed point within a long, changing Late Pleistocene horizon. Derryvree offers firm evidence for a freshwater tundra environment; Castlepook offers strong evidence for an Ice Age fauna and a provocative, still limited indication of human carcass processing. Beyond those archives, certainty gives way to inference. Ireland's history at this depth is written in mud, pollen, bone, teeth and till—and its most honest chronology is measured in millennia, not years.

Chapter 009 of 100

31092 BCE

Derryvree's Interstadial Muskeg^[9]



31,092 BCE is a modern chronological label, not a year that can be recovered from an Irish calendar, settlement record or remembered event. It corresponds roughly to 33,041 years before AD 1950, the conventional reference point for “before present” dating. At such depth in time, modern calendar-year precision is unavailable. Ireland can be discussed only through broad calibrated ranges, geological sequences, animal remains and environmental traces. The nearest unusually informative Irish sequence, at Derryvree near Maguiresbridge in County Fermanagh, has a radiocarbon determination of 30,500 +1,170/-1,030 radiocarbon years BP. Calibration places it broadly at about 36,900–31,700 calendar years BP, or roughly 34,950–29,750 BCE. The assigned date falls within that wide span; it does not identify a particular day, season, community or event.

A Wetland Between Ice Advances

Derryvree was revealed in 1969 when roadworks cut through a drumlin, one of the streamlined hills formed largely from debris deposited by moving ice. Beneath an upper sheet of till, and above an older sheet, investigators found fine sands, silts and organic freshwater deposits. The sequence establishes an important order of events. Glacier ice had earlier occupied or affected the locality; subsequently, the place was ice-free long enough for standing or slow-moving water, plants and small animals to leave a sedimentary record; later ice advanced again and sealed that record beneath fresh till.

This does not mean that all Ireland was free of ice in 31,092 BCE. Derryvree is a local archive, not a map of the entire island. The extent, thickness and timing of ice in Ireland during the later part of Marine Isotope Stage 3 remain difficult to reconstruct because later glaciers eroded, buried and rearranged older evidence. Recent British–Irish Ice Sheet modelling portrays a developing and highly variable ice complex

around this wider period, while Derryvree demonstrates that at least one part of Fermanagh had experienced a non-glacial freshwater interval. Both observations can be true: the island's conditions were regionally diverse and changed over long timescales.

The organic bed is valuable precisely because it preserves life that usually vanishes from glaciated landscapes. Its pollen, seeds, mosses and insect remains indicate open, treeless vegetation and a periglacial regime. The older investigators used the term “muskeg” for its waterlogged ground; in practical terms, this suggests a patchwork of saturated sedge beds, shallow pools, muddy margins and mossy surfaces rather than either dense forest or a modern raised bog. Bogbean, *Menyanthes trifoliata*, is among the plants represented, alongside sedges, grasses, herbs and cold-tolerant mosses. Dwarf willow and juniper were part of the wider vegetation picture inferred from such evidence, but no single species should be imagined as covering every slope or surviving unchanged throughout the whole dated interval.

Climate Without a Single Weather Report

The period belongs to the Late Pleistocene, within the fluctuating climatic world conventionally called Marine Isotope Stage 3. It preceded the fullest expansion of the last British–Irish Ice Sheet, but it was no uncomplicated respite from cold. North Atlantic climate repeatedly shifted on millennial scales, affecting temperature, precipitation, snow persistence, vegetation and glacier growth. Speleothems in Crag Cave, County Kerry, provide independent evidence that liquid water could occasionally circulate through caves during milder phases, while interruptions in growth signal more severe conditions. Such cave deposits do not supply an annual weather forecast for Derryvree, but they support the broader conclusion that south-western Ireland, like the rest of the North Atlantic fringe, experienced instability rather than a fixed Ice Age climate.

At the notional point represented by 31,092 BCE, an exposed Fermanagh wetland would have had a short growing season, frozen or waterlogged soils and little shelter from wind. Yet “tundra” should not be mistaken for lifeless desert. Wet ground can support productive, localised plant communities; pools sustain aquatic life; and patches of herbs, sedges and mosses can feed invertebrates and grazing animals. The evidence demonstrates a cold ecological mosaic. It cannot securely tell us the month in which any seed fell, how deep snow lay in a particular winter, or whether a similar wetland existed simultaneously in Cork, Clare or Kerry.

Animals on an Island Margin

Fossil assemblages, particularly those from limestone caves in southern Ireland, show that sizeable mammals reached the island during parts of the pre-Last Glacial Maximum period. Castlepook Cave, near Doneraile in County Cork, is the most important Irish site for this deeper fauna. Its collections include remains attributed to reindeer, woolly mammoth, giant deer, brown bear, fox, hare, lemmings and spotted hyaena. These animals make clear that Ireland was not permanently isolated from European ecological processes. Faunal movement must have occurred when geography, climate and available routes allowed it.

However, Castlepook's animal list is not a census from one year, season or even one undisturbed occupation layer. Much of the cave was excavated in the early twentieth century, and its bone deposits accumulated through varied processes: carnivores carrying prey or scavenged remains into shelter, animals dying naturally, water moving material, and later human excavation disturbing sediments. Modern re-dating has also shown that some older radiocarbon determinations understated the antiquity of

the fauna. The responsible conclusion is that different cold-stage animal communities used or were represented at Castlepook across a long span, not that mammoths, hyaenas and every other recorded species necessarily stood together in the same Irish valley in 31,092 BCE.

Reindeer are especially relevant to the Derryvree-type landscape. They are well suited to open, cold country and could exploit sparse vegetation across extensive ranges. Their presence, like that of lemmings and Arctic-adapted predators, reinforces the interpretation of a substantially colder Ireland than today. Spotted hyaena is an equally arresting reminder that caves were not naturally human places: they could be carnivore dens and bone traps. A cave deposit therefore records animal behaviour and geological chance before it can be used as evidence of human activity.

The Human Question

A reindeer femur from Castlepook has been reported to bear a deep mark interpreted as a possible chop or cut made while fresh bone was being processed with a sharp stone tool. Its age, broadly close to thirty-three thousand radiocarbon years ago, has made it central to discussion of a possible very early human presence in Ireland. If that interpretation is eventually confirmed through renewed study and securely stratified finds, it would substantially extend the island's known human story.

For the date represented here, though, the evidence is insufficient to claim a settlement, hunting camp, family group or continuous occupation. The bone was recovered from an old cave collection rather than a modern, sealed archaeological context, and a mark on bone requires separate taphonomic assessment from the dating of the animal itself. No unequivocal stone-tool assemblage, hearth, dwelling floor, human burial, engraving, ritual site or repeated occupation horizon is known in Ireland from this period. The most defensible wording is that transient human visits remain possible, not proven.

That distinction sets firm limits on social history. There is no evidence for political institutions, named leaders, diplomacy, territorial rule or organised warfare in Ireland around 31,092 BCE. Nor is there Irish evidence for trade networks, farming, animal husbandry, pottery, textiles, writing, formal religion or teaching institutions. If people did reach the island, they would have belonged to highly mobile Upper Palaeolithic populations operating in a wider north-west European world; but applying that general European comparison cannot substitute for Irish finds. It does not prove who crossed, how often they travelled, or how they understood this landscape.

Routes, Resources and Absence

Lower global sea levels altered the geography of north-west Europe, but they do not justify a simple claim that Ireland was automatically joined to Britain by a permanent dry-land corridor. Coastlines, ice margins, river systems and marine passages shifted repeatedly, while the exact accessibility of routes depended on the phase under discussion. Animal fossils establish intermittent ecological connection, yet they do not reveal a specific route or the duration of any connection. Equally, the apparent scarcity of human evidence should not be treated as proof that nobody ever came. Later ice was an efficient destroyer and recycler of soils, campsites and exposed land surfaces.

Derryvree offers the clearest lesson for this notional year: prehistoric Ireland is not a blank stage before history, but neither is it a place where a conventional annual narrative can honestly be imposed. A buried freshwater bed, sealed between glacier deposits, records resilient plant and insect life in a cold landscape. Castlepook's cave fauna reveals that large mammals intermittently inhabited the island, and a marked reindeer bone raises a major but unresolved question about people. What can be stated with

confidence is environmental: parts of Ireland contained living, locally ice-free periglacial habitats during this broad interval. What remains interpretation is the scale of animal movements, the exact pattern of ice cover, and any human role within that world.

Chapter 010 of 100

31091 BCE

The Castlepook Butchery Claim^[10]



The label 31,091 BCE is a modern chronological convenience, not a year that anyone in Ireland could have named or recorded. It falls roughly 33,040 years before AD 1950, the reference point conventionally used for radiocarbon chronologies, but neither radiocarbon dating nor archaeological stratigraphy can identify a particular Irish season, journey or individual at this precision. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, a fluctuating cold interval of the Late Pleistocene before the Last Glacial Maximum. The evidence is sparse, discontinuous and often reworked by later ice. Yet it offers an unusually vivid, if partial, picture: cold wetlands in Fermanagh, a varied Ice Age fauna in Cork, and one disputed-looking but potentially transformative trace of human activity.

A Date Within Ranges

The most relevant environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and exposed freshwater silts and fine sands sealed between two substantial layers of glacial till. The deposit was therefore formed during an interval when this part of Ireland was not covered by the ice that created the enclosing sediments. Its key radiocarbon determination, Birm-166, was reported as about 30,500 radiocarbon years before present; subsequent calibration has placed the deposit broadly around 36,900–31,700 calibrated years before present. The modern label 31,091 BCE falls within that very broad range, but it cannot be attached to a particular layer, plant, animal or event in the exposure.

This distinction matters. Derryvree is not a diary of one year; it is a compressed environmental archive built over time. The lower and upper tills show that glacier ice had occupied the area before the organic-rich freshwater phase and returned afterwards. The sequence disproves any simple picture of Late

Pleistocene Ireland as uniformly and continuously ice-covered. It does not, however, prove that the entire island was ice-free at once, or establish how long conditions at Derryvree lasted. Ireland's glaciers repeatedly advanced, stagnated, retreated and overwrote older deposits. Later ice destroyed much of the evidence that might otherwise settle local chronology.

Derryvree's Cold Wetland

Pollen, plant macrofossils, mosses and insect remains from the Derryvree sediments point to a treeless, severe environment. Sedges, grasses, dwarf willow, juniper, mountain-avens, bogbean and other herbaceous plants indicate open ground with wet hollows, pools and mossy vegetation: a tundra-like or muskeg landscape rather than woodland. The insect evidence likewise suggests standing water rich in plant material, bordered by mosses and low vegetation. Winters were harsh, summers short, and ground conditions were shaped by frost, thaw and persistent moisture.

That was not an empty wasteland. Wetlands concentrated water, plants and invertebrate life, while open vegetation could support grazing animals. Nevertheless, the record does not justify imagining modern bogs, broad forests or a settled countryside. The Derryvree landscape was a dynamic periglacial mosaic, vulnerable to climatic shifts and eventually overwhelmed or buried by renewed glaciation. Its survival beneath a drumlin is an accident of geological preservation, not evidence that comparable wetlands are known throughout Ireland.

At the scale of the island, environmental change was the principal force shaping every possibility of life. Sea level was lower than today because much global water was held in ice sheets, but the exact routes available between Ireland, Britain and continental Europe changed through time and remain difficult to reconstruct for a particular moment. Animal movements into Ireland show that dispersal was possible during favourable phases; they do not demonstrate a permanent, easy land corridor or a stable human route.

Castlepook's Animal World

South-western Ireland supplies another important archive. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork, produced one of Ireland's richest Pleistocene faunal assemblages during excavations in the early twentieth century and later investigations. Its bones include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Re-dating programmes have shown that some of the material belongs to Marine Isotope Stage 3, well before the Last Glacial Maximum. Published results include pre-maximum dates for mammoth, reindeer, brown bear and giant deer, while improved methods have also demonstrated that some earlier dates required revision.

The cave should not be treated as a photograph of one animal community or one moment. A cave can serve as a carnivore den, trap, shelter, drainage route and sediment store. Bones may be carried in by hyaenas, wolves or water; deposits may mix material of different ages; and nineteenth- and early twentieth-century excavation methods did not preserve the contextual detail expected today. The presence of mammoth and hyaena in the same cave system does not prove that every specimen lived beside every other specimen, much less that all were present in 31,091 BCE. It establishes something both firmer and more remarkable: Ireland sustained a much richer cold-stage mammal fauna than its later historical fauna.

Spotted hyaena is especially revealing. Far from its modern African range, the Late Pleistocene form occupied northern European environments and could accumulate bones in caves. At Castlepook, carnivore activity is a more secure explanation for much of the assemblage than human action. Reindeer and giant deer would have been important herbivores within open country, while mammoths were part of a broader north-west European cold-stage fauna. Predators, scavengers and grazing animals were linked by seasonal food availability, shelter and shifting access to land beyond the reach of advancing ice.

The Mark on a Reindeer Femur

For this approximate date, one object commands particular attention: a reindeer femur from Castlepook Cave, held in the National Museum of Ireland's natural-history collections. It has been reported as about 33,000 years old and bears a deep mark interpreted by the palaeozoologist Ruth Carden as having been made with a sharp stone tool during butchery. County Cork's heritage material presents it as evidence that Stone Age hunters processed a reindeer in the Doneraile area around 31,000 BCE. If that interpretation is confirmed, it would be Ireland's earliest known evidence of people handling an animal, tens of millennia older than the securely established post-glacial settlement record.

Its importance demands restraint. The specimen was recovered from an old cave collection, not a modern excavation of an intact occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, human burial or repeated butchery area of comparable age has yet been found at Castlepook. A radiocarbon measurement dates the animal's death, not necessarily the precise act of cutting, the place where it was killed, or the duration of any human visit. Identifying a mark as anthropogenic is a specialist assessment that must be tested against damage caused by carnivores, sediment movement and excavation. The bone is consequently best understood as compelling potential evidence for a fleeting Palaeolithic visit, not proof of a resident population or a permanent settlement.

No Politics, No Recorded Diplomacy

There is no basis for describing Irish political affairs, diplomacy, named peoples, territories or warfare in this period. No writing existed, and no settlement plan, graveyard, monument or artefact assemblage can yet be securely assigned to Ireland in 31,091 BCE. Even if the Castlepook mark represents human butchery, it says nothing certain about language, identity, leadership, kinship or belief. Terms such as "Irish", "Celtic" and "tribe" would impose far later categories on a deep prehistoric landscape.

What can be inferred, cautiously, concerns the practical demands of any visitors. Hunters or scavengers capable of reaching Ireland would have required knowledge of animal behaviour, stone-working and seasonal conditions. A reindeer carcass could provide meat, fat, hide, sinew and bone, but the Castlepook find alone cannot reveal how these materials were shared or used. Any group would probably have been small and mobile, but even that is an inference from wider Upper Palaeolithic lifeways, not a fact demonstrated by an Irish camp. There is no evidence for farming, trade networks, permanent villages, ritual monuments, formal learning institutions or organised exchange within Ireland at this date.

Iceward Change

The wider trajectory was towards greater glaciation. The Last Glacial Maximum lay in the future, with the British-Irish Ice Sheet reaching its greatest later extent roughly between 25,000 and 23,000 years ago in many reconstructions. Its growth was neither uniform nor instantaneous: individual sectors

behaved differently, and the Irish Sea, western coast and uplands have their own complicated records. Still, the Derryvree sequence captures the central long-term reality. A freshwater wetland existed during a cold interval; renewed ice later buried it; and the landscape known to its plants and animals was transformed beyond recovery.

Thus the history of Ireland around 31,091 BCE is not one of kings, battles or towns. It is a history preserved in silt, pollen, moss fragments, insect remains and cave bone. Derryvree provides the strongest evidence for an exposed northern wetland within a broad calibrated range. Castlepook provides a southern faunal archive and an intriguing claim for human butchery. Together they show an island at Europe's far north-western margin, intermittently habitable for cold-adapted animals and perhaps briefly visited by people, but standing on the threshold of a more extensive ice-bound world.

Chapter 011 of 100

31090 BCE

The Fermanagh Pool Mosaic^[11]



31,090 BCE is a modern chronological label, not a date at which Ireland's archaeological record can identify a happening. There is no calendar, written testimony, settlement layer or securely dated event that can be assigned to that particular year. In radiocarbon terms, the label falls broadly around 33,000 calendar years before present, but the relevant Irish evidence is generally dated in wide calibrated ranges and belongs to the unstable later Pleistocene, especially Marine Isotope Stage 3. The responsible history of Ireland at this depth is therefore a history of sediments, fossil plants, animal bones, cave deposits and advancing ice rather than rulers, wars or named communities.

The closest illuminating evidence comes from two very different places: an organic deposit buried beneath glacial sediments at Derryvree near Maguiresbridge, County Fermanagh, and the rich Pleistocene cave-bone collections from Castlepook, near Doneraile in north County Cork. Neither is a snapshot of 31,090 BCE. Derryvree records a local wetland interval whose conventional radiocarbon determination was about 30,500 radiocarbon years before present, with a substantial error range; Castlepook contains bones accumulated over a long and complicated span. Yet together they reveal an Ireland that was cold, mostly treeless and environmentally changeable, but not simply an unbroken sheet of ice.

A Landscape Between Ice Advances

At Derryvree, road works in 1969 exposed sands, silts and organic material trapped between two tills: deposits laid down directly by glacier ice. The succession is important precisely because later ice movement commonly scoured away or disturbed older ground surfaces. Here, however, an interval of freshwater and wet ground survived beneath younger glacial sediments. It shows that the locality was ice-free when the organic material accumulated, before a later advance covered it again.

Plant pollen, seeds, mosses and insect remains point to a cold, open setting. Grasses, sedges, herbs, juniper and arctic-alpine plants belonged to a landscape without closed woodland. Mossy ground and shallow pools supported freshwater life. Earlier descriptions called this a muskeg: waterlogged, peaty ground interspersed with pools, rather than a modern Irish bog in its familiar wooded or agricultural surroundings. It would have been a patchwork of damp hollows, exposed mineral ground, low vegetation and seasonally frozen soils.

This was not necessarily the scene everywhere on the island at once. Derryvree is a local archive in Fermanagh, not a national weather station. Its fossils establish freshwater conditions and cold, treeless vegetation at that site; wider reconstructions of steppe-tundra, periglacial terrain and regional ice margins are interpretations assembled from the deposit, cave fauna, landforms and North Atlantic climate records. The distinction matters. Ireland's climate during Marine Isotope Stage 3 changed abruptly and repeatedly over millennia. A numbered BCE year cannot securely be matched to a single warming pulse, a particular season or an exact ice-front position.

The Coming Maximum

The period around 33,000 calendar years ago lay before the fullest expansion of the last British–Irish Ice Sheet. Modern reconstructions place the principal maximum of that ice sheet later, broadly between about 27,000 and 21,000 years ago, although ice growth and retreat differed from one sector to another. Thus it would be misleading to say that all Ireland was already buried beneath the ice at the requested date. Equally, it would be wrong to imagine a mild, stable country awaiting settlement. The long-term direction was towards increasingly severe glacial conditions and, eventually, extensive ice cover.

Glaciation shaped both what survives and what does not. Ice can transport, crush, redeposit and remove sediments, while freeze-thaw action fragments exposed rock and soil. An absence of campsites from this time is consequently not straightforward proof that no people ever entered Ireland. But erosion cannot turn a lack of evidence into evidence of towns, hunting territories or a permanent population. The archaeological record must retain its limits: no securely associated Upper Palaeolithic hearth, stone-tool assemblage, dwelling floor, burial or occupation surface has yet demonstrated an established human community in Ireland around this horizon.

Animals in the Cave Record

Castlepook Cave, also known as Mammoth Cave, provides Ireland's most celebrated assemblage of cold-stage mammal remains. Excavated mainly in the early twentieth century, it yielded bones of woolly mammoth, reindeer, giant deer, spotted hyaena, brown bear, wolf, foxes, hare, stoat and lemmings. The National Museum of Ireland's collection includes, among other material, a spotted-hyaena skull from the cave. These species show that Ireland was connected ecologically to the wider north-west European world of the late Ice Age, whether through temporary dispersal opportunities across altered coastlines and seas or through routes not yet fully resolved by the surviving evidence.

The list should not be read as a single wildlife census for 31,090 BCE. Cave assemblages are time-averaged. Carnivores may drag prey into caves; animals may die in fissures; water may move bones; excavators working more than a century ago did not have today's methods for recording microscopic stratigraphy and three-dimensional positions. Individual radiocarbon dates also require calibration and re-evaluation as laboratory techniques improve. Castlepook is invaluable, but it records a long Pleistocene history rather than one perfectly preserved moment.

Even so, the combined fauna fits the broad environmental picture. Reindeer and lemmings are strongly associated with cold open habitats; mammoth and giant deer indicate that sufficient forage and traversable terrain existed at least during relevant phases; hyaenas, wolves and bears demonstrate a substantial predator guild. For grazing animals, sedges, grasses, herbs and perhaps lichen-rich ground could offer seasonal food. For predators, caves and limestone fissures could serve as dens, scavenging places or traps. This was a living landscape, not a sterile white void, but its productivity and accessibility would have varied sharply with weather, snow cover, water and the movements of ice.

The Human Question

Castlepook also matters because a reindeer femur from its historic collection has been reported to bear a deep mark consistent with cutting or chopping by a sharp stone implement. If the mark proves to be a fresh-bone butchery trace made by people, it would provide striking evidence for a brief human encounter with an animal in Ireland during the Upper Palaeolithic. It would not, however, demonstrate a village, a continuously occupied island or a population descended from those visitors.

The caution is not evasive. A bone date measures the age of the animal's remains, not automatically the instant a surface modification was made; old collections can lack the secure contexts required to settle every taphonomic question. Recent Castlepook investigations have shown that Pleistocene deposits remain in parts of the cave system, while also underlining how much careful excavation, dating and microscopic study are still needed. At present, the evidence supports the possibility of transient human activity more readily than it supports any fuller narrative of settlement.

People elsewhere in north-west Europe certainly possessed Upper Palaeolithic stone technologies and sophisticated hunting knowledge at this broad date. That continental fact should not be imported wholesale into Ireland. There is no reliable Irish evidence from around 31,090 BCE for houses, tailored clothing, boats, ritual places, art, language, kin groups, trade networks or formal leadership. It is reasonable to infer that any visitors capable of processing a large carcass would have relied on co-operation, portable tools and detailed environmental knowledge. It is not responsible to turn that inference into an Irish society with named customs or institutions.

No Politics, but Regional Change

There can be no political affairs, diplomacy or warfare in the ordinary historical sense because no polity is visible in the evidence. Nor is there evidence for farming, stored harvests, domestic livestock, markets or exchange systems. The economy recorded most clearly is ecological: plants capturing a short growing season, herbivores converting them into meat and movement, and carnivores exploiting prey and carrion. If humans were present, their subsistence may have included opportunistic hunting or carcass processing, but the Irish evidence cannot establish whether a reindeer was hunted, scavenged or encountered elsewhere and its remains later deposited in a cave.

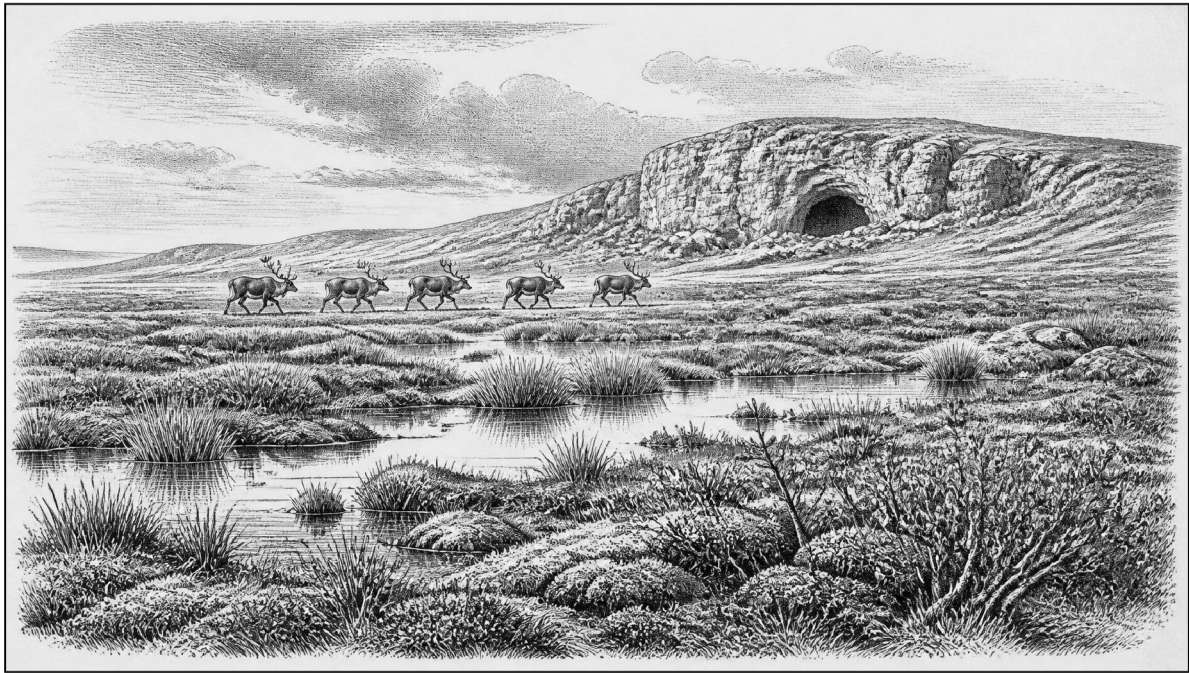
Religion, culture and learning are likewise beyond direct recovery. A cave should not automatically be called sacred, and a cut-marked bone is not art or ceremony. The surviving evidence instead conveys a different kind of historical development: Ireland's repeated environmental reorganisation during the last cold stage. Wetlands formed in sheltered basins; animal populations reached or departed from the island; ice later advanced across landscapes that had supported plants and mammals. Those changes determined the opportunities and constraints that any human traveller would have faced.

The most defensible picture for around 31,090 BCE is therefore precise in its uncertainty. Ireland was part of a harsh, dynamic late-Pleistocene region. In Fermanagh, an ice-free wetland at some point in the wider interval preserved the remains of cold-adapted vegetation and freshwater life. In Cork, cave deposits retained evidence of a diverse mammal community and a possible, still limited signal of human butchery. Modern calendar precision is unavailable; calibrated ranges, stratigraphy and careful comparison are the proper tools. Their testimony is fragmentary, but it gives Ireland a real deep history long before the island's later, securely documented human settlement.

Chapter 012 of 100

31089 BCE

Mammoth Cave's Unsettled Reindeer^[12]



A Date Beyond Annals

31,089 BCE is a modern label for a point in deep prehistory, not a year for which Ireland has a chronicle, named ruler, settlement record or recoverable political event. Modern calendar-year precision is not available. In the archaeological convention that counts backwards from AD 1950, it falls roughly 33,038 calendar years before present, but the evidence comes in radiocarbon ranges, disturbed cave deposits and long environmental sequences whose uncertainties are measured in centuries or millennia. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3, before the fullest expansion of the Last Glacial Maximum ice sheet.

This was not yet the familiar island of farms, woods, towns or even securely demonstrated hunter-gatherer communities. It was a changing north-west European landscape on the margin of major climatic fluctuations. Ice, sea level, vegetation and animal ranges were all in motion over timescales far larger than a single numbered year. The historical record for this era is exceptionally fragmentary because later glaciers eroded, buried and reworked much of what had existed on land.

An Island in a Changing Ice Age

Ireland's precise geography around this date cannot be reconstructed as a fixed map. Sea level was lower than today because vast quantities of water were locked in northern ice sheets, exposing areas of continental shelf. Yet low sea level did not automatically mean an easy, continuous land route from Britain to Ireland. The extent of ice, water and exposed ground shifted repeatedly, while the Irish Sea

basin and northern approaches were shaped by both glacial ice and relative sea-level change. Animal movement and any human approach to Ireland may have been possible during suitable phases, but no particular route can be demonstrated for 31,089 BCE.

The island was approaching, rather than already at, the Last Glacial Maximum. Modern reconstructions place the maximum extent of the British–Irish Ice Sheet later, broadly around 27,000–23,000 calibrated years before present, with maximum ice volume around 23,000 years ago. That later ice sheet profoundly remodelled Ireland’s surface. Drumlins, tills, moraines and scoured bedrock are its legacy, but its erosive force also helps explain why evidence for earlier landscapes and people survives only in unusual protected deposits.

Climate at this date should not be pictured as a single, uninterrupted white wilderness. The later Pleistocene contained sharp climatic oscillations. In some localities Ireland had open, cold-adapted terrain, seasonal wetlands and extensive grazing country; in others, advancing ice or periglacial conditions could make the landscape markedly harsher. The balance of evidence points away from closed forest. Any tree pollen found in cold-stage deposits must be assessed cautiously, since pollen can travel long distances. It does not by itself prove nearby woodland.

Derryvree’s Buried Wetland

The clearest environmental evidence relevant to this broad era comes from Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 cut through a drumlin and revealed freshwater silts and fine sands sealed between two distinct till sheets. That order matters. An earlier glacier had deposited till; an interval without local ice then allowed waterborne sediment and organic material to build up; a later advance buried the wetland beneath fresh glacial sediment.

The organic deposits produced the radiocarbon determination Birm-166, reported as 30,500 radiocarbon years BP with an uncertainty of +1,170/–1,030 years. This is an uncalibrated radiocarbon result, not a date that can honestly be converted into one exact BCE year. Modern calibration curves are essential at this depth of time because atmospheric carbon-14 changed substantially; they yield probability ranges rather than a single anniversary. The Derryvree sequence therefore illuminates a lengthy cold interval around the date in question, not the weather or events of 31,089 BCE itself.

Its flora and fauna point to treeless, open tundra or muskeg-like wetland under a periglacial regime. Sedges, mosses, dwarf shrubs and cold-adapted aquatic plants indicate shallow water, saturated ground and patches of open vegetation rather than a uniform frozen desert. Such a wetland would have been a small ecological refuge: a place where meltwater or groundwater collected, plants grew during the short productive season and insects, birds and mammals could exploit a concentrated resource. It was nevertheless one locality in Fermanagh, not a complete map of Ireland.

Castlepook and the Animal Record

In north County Cork, Castlepook Cave near Doneraile – long known as Mammoth Cave – supplies a different sort of evidence. Its cave deposits and museum collections make it the richest known Irish site for Pleistocene vertebrate remains. They include woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. The assemblage shows that, during suitable phases before the Last Glacial Maximum, Ireland supported a far more varied cold-stage fauna than the modern island does.

That list must not be turned into a single cinematic scene. Cave deposits can accumulate over very long periods. Animals may die at different times; hyaenas can drag bones into dens; water, burrowing and older excavation methods can mix material. The original major exploration of Castlepook took place in the early twentieth century, before the detailed stratigraphic recording, sieving and scientific dating expected today. Later research has also shown that some older radiocarbon determinations from southern Irish caves need reassessment as laboratory pretreatment methods improve.

Even so, the fauna is historically important. Reindeer imply open country capable of sustaining grazing herds, perhaps with seasonal movements across a wider region. Mammoths and giant deer indicate extensive plant resources in at least some phases. Predators and scavengers, including hyaenas and wolves, show that carcasses were contested resources and that caves could belong as much to carnivores as to people. This was a living landscape shaped by seasonal scarcity, mobility and risk, not merely an empty prelude to later Irish history.

The Reindeer Femur Question

One Castlepook specimen gives this period unusual archaeological interest: a fragment of reindeer femur bearing a deep surface incision interpreted by zooarchaeologist Ruth Carden as consistent with cutting by a sharp stone tool during carcass processing. Public accounts have associated the bone with roughly 33,000 years ago, making it potentially far earlier than the better-attested terminal Pleistocene evidence for human activity in Ireland. If the mark is confirmed as a stone-tool cut made when the bone was fresh, it may be evidence that people handled a reindeer in Ireland during this broad interval.

That is a significant but deliberately narrow claim. A radiocarbon date indicates when the animal died within a statistical range; it does not independently date a surface mark, identify the person who made it, show where the animal was killed or establish the length of any human stay. Nor has Castlepook produced a securely associated house, hearth, stone-tool assemblage, burial or intact butchered-animal concentration of this age. A single modified bone cannot demonstrate a permanent population, a named cultural group or a settled hunting camp.

The nearest firm comparison is also contextual rather than identical. Directly dated pre-Last Glacial Maximum deer remains from south-east Irish caves include a calibrated range of 32,930–31,280 cal BP, equivalent approximately to 30,981–29,331 BCE. Such dates demonstrate that large deer were present in Ireland around the wider period, but they do not date Castlepook's incision or place people at a particular spot in 31,089 BCE. The evidence supports possibility and investigation, not certainty beyond what the object itself can bear.

People, Society and What Cannot Be Recovered

If people did visit Ireland at this time, the safest interpretation is that they were members of very small, highly mobile Upper Palaeolithic groups whose movements were tied to animals, seasons and routes across changing coastal and shelf landscapes. Reindeer could have offered meat, fat, hide, sinew, antler and bone. Yet none of these practical uses can be demonstrated from the isolated femur alone. There is no basis for describing dwellings, clothing, language, kinship, ritual, artistic traditions or regular trade in Ireland at this date.

Accordingly, political affairs, diplomacy and organised conflict are absent from the record, not overlooked subjects. There are no polities, leaders, borders, treaties or battlefields to identify. Nor is there evidence for farming, herding, metalwork, monuments, writing, formal religious institutions or exchange

networks on the island. A possible short visit by hunters would not be equivalent to colonisation. Even the question of whether Ireland had a recurrent human presence before the Last Glacial Maximum remains open.

Culture and learning survive only in the broadest possible sense: in the accumulated knowledge that any mobile people would have needed to survive a cold, variable environment. Reading animal movement, finding sheltered ground, processing carcasses and navigating unfamiliar terrain would have required skill. But these are reasonable inferences from Upper Palaeolithic lifeways elsewhere in Europe, not discoveries made in Ireland. They must remain clearly separate from the direct Irish evidence.

Regional Change as the Main Story

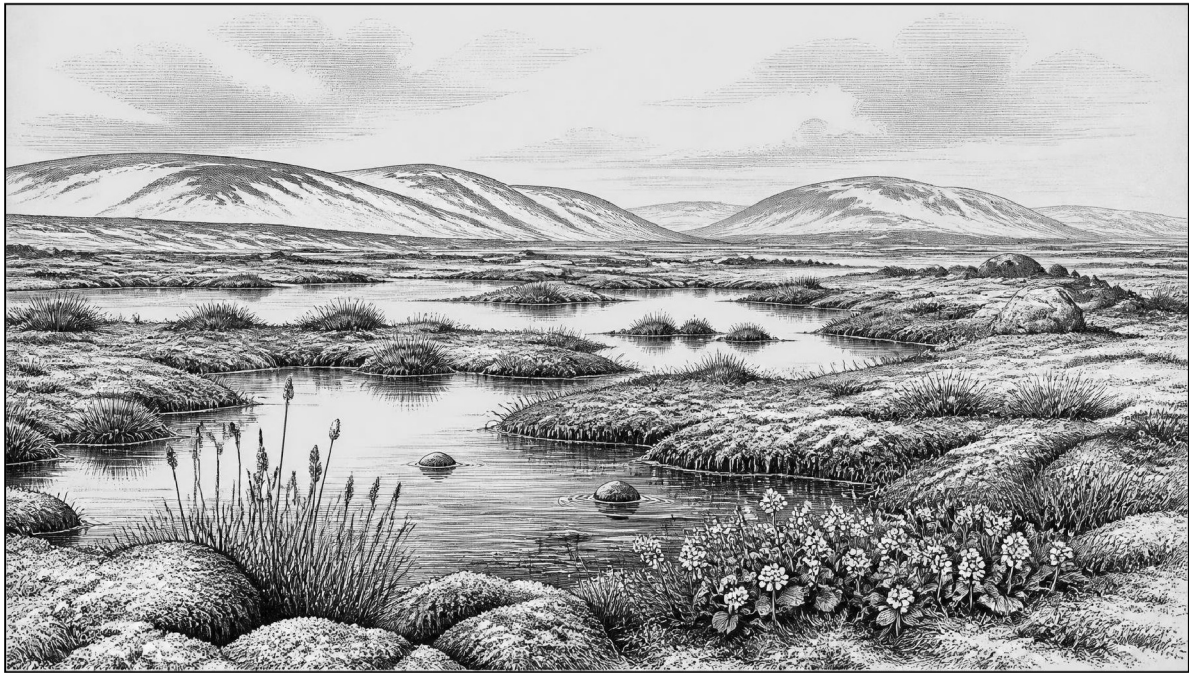
The largest development around 31,089 BCE was environmental. In Fermanagh, wetlands could briefly preserve plants and small animals between episodes of glaciation. In Cork, limestone caves trapped a long and complex record of large mammals and carnivores. Across the island, glaciers and periglacial processes were preparing to alter or destroy many older surfaces. The coming maximum of the British–Irish Ice Sheet would leave a landscape whose surviving Ice Age archive is scattered, difficult to date and often dependent on old collections.

For this reason, the most truthful account of Ireland in 31,089 BCE is not a tale of a particular king, raid or settlement. It is a cautiously reconstructed world of open cold-country vegetation, wetlands, reindeer and other large mammals, carnivore dens, shifting coasts and advancing ice. Castlepook's marked femur offers a tantalising possibility of human contact; Derryvree gives secure evidence for a cold freshwater ecosystem. Together they reveal not a calendar year with known events, but an island at the edge of habitation and on the threshold of profound glacial change.

Chapter 013 of 100

31088 BCE

Derryvree's Buried Tundra^[13]



The label 31,088 BCE cannot identify an event, a ruler, a community or even a season in Ireland. It is a modern calendar conversion, roughly 33,037 years before the archaeological reference year of AD 1950. No written record exists, and the available evidence cannot be resolved to an individual calendar year. The responsible subject is therefore a broad Late Pleistocene interval: Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. Ireland at this depth of time is known through buried sediments, fossil plants and insects, animal bones, cave deposits and the traces left by advancing ice.

The strongest Irish environmental evidence relevant to this notional date comes from Derryvree, near Maguiresbridge in County Fermanagh. There, road works in 1969 cut through a drumlin, exposing a remarkable sequence: organic-rich freshwater silts and fine sands lay between two thick beds of till, the unsorted material deposited by glacier ice. The sequence provides a secure order of events. Ice had formerly occupied the locality; an interval followed in which open water and wet ground supported life and accumulated sediment; then a later ice advance buried the deposit. It is not an annual record, but it is a rare surviving chapter from an Irish landscape repeatedly remodelled by glaciers.

A Date Within a Range

Organic material from the Derryvree deposit produced the radiocarbon determination BIRM-166, conventionally dated to 30,500 years BP, with a large uncertainty of approximately +1,170 and -1,030 years. Radiocarbon years are not the same as calendar years. Because atmospheric carbon-14 levels have varied over time, such measurements require calibration against independently dated records. Published calibrations place the Derryvree deposit broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE.

Thus 31,088 BCE falls within the wide period that Derryvree may illuminate, but it cannot be assigned to a particular sediment layer, plant, insect or episode at the site. The range is not an inconvenience to be hidden: it is the essential limit on what can be claimed. Derryvree demonstrates that its part of Fermanagh was ice-free during a cold interval in later MIS 3. It does not prove that every part of Ireland was ice-free at once, nor that the exact conditions observed in the deposit prevailed across the island in the modern calendar year selected here.

This distinction also matters for the name “Ireland”. The island’s present coastlines, political divisions and familiar regional identities belong to a vastly later world. Sea level was lower globally during glacial conditions, but local coastlines and routes were shaped by a complicated interaction of sea level, ice loading and the changing form of the British–Irish Ice Sheet. It is reasonable to infer that animal dispersal into and out of the area required changing terrestrial or marine connections with Britain and continental Europe. It is not responsible to draw a fixed land bridge, a known route or a political frontier for 31,088 BCE.

Fresh Water Under an Open Sky

Derryvree’s value lies in the life preserved in its freshwater sediments. The plant evidence includes mosses, sedges and herbs characteristic of open tundra-like ground, rather than closed forest. A fossil seed of bogbean (*Menyanthes trifoliata*) is especially memorable. Today bogbean is associated with wet ground and the margins of freshwater pools; its presence in the ancient deposit confirms a watery habitat amid a generally severe setting. Other remains indicate low, sparse vegetation, with wet hollows and shallow pools set within an exposed, periglacial landscape.

Insect remains add an important independent line of evidence. They include species of cold northern aspect, supporting the conclusion that the climate was harsh. Periglacial does not necessarily mean a featureless expanse of permanent snow or ice. It describes ground affected by frost in the vicinity of glaciers: freezing and thawing, short growing seasons, open plant cover, and local waters sustained by seasonal melt, rainfall or groundwater. Derryvree therefore offers a more varied picture than the shorthand “Ice Age” suggests. There were habitats in which mosses, aquatic plants and invertebrates could survive, even as wider climatic deterioration set the conditions for renewed glaciation.

The evidence speaks most securely about environment, not human settlement. There are no Derryvree hearths, stone tools, huts, graves, ornaments or human remains. Nothing there can establish a language, a kinship system, leadership structure, religion or named people. Nor is there any evidence for farming, herding, cultivated fields, pottery, metalworking or monuments. The ordinary categories of later Irish history—politics, diplomacy, warfare, learning and trade—cannot be populated at this date without invention.

Animals at Castlepook

Far to the south, Castlepook Cave near Doneraile in north County Cork provides the principal Irish archive for Late Pleistocene mammals. The cave, also known as Mammoth Cave, has yielded remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, Arctic fox, mountain hare, Norwegian and collared lemmings, and spotted hyaena. This is an extraordinary fauna for Ireland, showing that the island or its changing landmass could at times support, or receive, animals now absent from the country.

Yet Castlepook must be read with care. Much of its material was excavated in the early twentieth century, before modern standards of stratigraphic recording, and the cave contains deposits of more than one age. Water movement, carnivore activity and earlier excavation may all have mixed or displaced bones. A cave is also not a census of a landscape. Hyaenas can carry carcass parts into dens; scavengers, natural deaths and sediment movement can each create bone accumulations. The listed animals need not all have lived together, nor does the presence of a species prove its abundance across Ireland.

Direct dating and later reassessment nevertheless place elements of the Castlepook fauna in MIS 3, before the Last Glacial Maximum. A woolly mammoth bone had an older radiocarbon result of about $33,400 \pm 1,200$ BP, while subsequent work has reconsidered the reliability and implications of dates from the southern Irish fauna. The important conclusion is modest but significant: Ireland's pre-maximum animal history was richer and more dynamic than the much later historic fauna implies. Reindeer and mammoth belong to the broader environmental world relevant to this article, but cannot responsibly be placed at Derryvree, or in a precise Irish valley, in 31,088 BCE.

The Human Question

The possibility of people in Ireland during this period remains one of the most intriguing and most constrained questions in Irish archaeology. A reindeer femur from Castlepook has been reported as bearing a possible cut mark made with a sharp stone tool and has been associated with a very early date. If confirmed, it could indicate that a human visitor handled or butchered an animal in Ireland during the Upper Palaeolithic. It would be a discovery of major importance.

But a single modified bone from an old cave collection is not evidence for a settled population. No securely excavated Upper Palaeolithic camp, tool assemblage, dwelling floor, hearth, human burial or human bone is currently known from Ireland for this interval. Natural scratches, carnivore damage, breakage and post-depositional movement can sometimes resemble intentional marks; the original find context is also incomplete. The proper conclusion is that short human incursions remain possible, not that 31,088 BCE had an established Irish hunter-gatherer society.

Modern humans certainly occupied parts of western Europe in the wider Upper Palaeolithic world. That fact provides a context for the Castlepook question, but it cannot fill Ireland's evidential silence. Cave art, formal burial customs, named tool traditions and long-distance exchange networks known in France, Iberia or central Europe should not automatically be imported across the sea. Ireland may have been visited intermittently; it may also have been bypassed during many cold phases. The existing Irish record cannot yet decide between those possibilities for this particular point in time.

Iceward Change

Derryvree captures an interval before the major build-up that eventually produced the Last Glacial Maximum. Later ice sheets eroded, transported and buried much of the older landscape, which helps explain why evidence is so scarce. Recent modelling of the western margin of the British–Irish Ice Sheet uses Derryvree as one of the few pre-maximum Irish constraints and places an ice-free phase around $33,500 \pm 1,200$ calibrated years BP, with a subsequent build-up beginning considerably later. The island-wide maximum lay thousands of years after the Derryvree interval, broadly in the period around 26,000–20,000 years ago, with considerable regional variation.

This approaching transformation was the decisive ‘regional change’ of the age. A cold wetland in Fermanagh, a cave fauna in Cork and shifting ice margins around the Irish Sea belong to a landscape whose resources, habitability and connections could alter dramatically across generations. If people did reach Ireland, mobility and subsistence would have depended on seasonal animal movements, exposed ground, water, weather and access routes rather than on territorial states or permanent settlements. That is an interpretation based on Palaeolithic lifeways elsewhere, not direct proof of an Irish community.

The most accurate portrait of Ireland around 31,088 BCE is consequently not a story of kings, conflicts or institutions. It is a buried tundra wetland beneath a Fermanagh drumlin; bogbean and mosses beside cold water; animals moving through changing open country; and a cave in Cork preserving fragments of a lost fauna. These remains establish a living, environmentally diverse Ireland during a fluctuating cold stage. They do not yet reveal who, if anyone, watched that landscape.

Chapter 014 of 100

31087 BCE

Hyaena Hall's Last Passage^[14]



“31,087 BCE” is a modern calendar label, not a date that can be recovered from Ireland’s deep past with year-by-year accuracy. No written record, settlement sequence or archaeological layer can be assigned responsibly to that single year. The most useful comparison is with the later part of Marine Isotope Stage 3, roughly 33,000 calendar years before present, when Ireland stood on the threshold of the Last Glacial Maximum. Even that comparison must be treated broadly: radiocarbon ages require calibration, cave deposits can be disturbed, and calibrated ranges commonly cover centuries or millennia rather than a particular season, let alone a named year.

For Ireland at this point, the central evidence comes not from houses, graves or tools, but from bones, cave sediments, glacial geology and environmental records. They describe a cold north-western European landscape occupied at intervals by large mammals and predators, with a still-unresolved possibility of very early human activity. County Cork’s Castlepook Cave, near Doneraile, is especially important. Its chambers, including the evocatively named Hyaena Hall and Elephant Hall, preserve the most substantial Irish faunal archive for this period.

Approaching the Ice Maximum

The date falls during the Midlandian, Ireland’s last major glacial stage. This was not a uniformly frozen era. Ice sheets advanced and retreated over long intervals, while local conditions changed with temperature, snowfall, sea level and the behaviour of glaciers. Research synthesising Irish evidence suggests that the island was still largely ice-free until about 32,000 calibrated years before present, before the ice sheet expanded towards its maximum extent. Thus 31,087 BCE should be imagined as close to a major environmental turning point, not as a time when the whole island can automatically be pictured beneath a single unbroken mass of ice.

Low global sea levels altered the map of north-west Europe. The coast lay far beyond many modern shorelines, and the geography between Ireland, Britain and the continental landmass was unlike that of today. Precisely when terrestrial or glacial corridors were available remains debated and varied through time. Recent sedimentary ancient-DNA work at Castlepook supports the broader conclusion that Irish Pleistocene animals belonged to populations connected with Eurasia before the Last Glacial Maximum. That is evidence of ecological connectivity, however, not a map of a safe route on a particular day, nor proof that people used the same routes.

The land itself was open, cold and exposed. It was not the green, wooded Ireland familiar from later prehistory. Plant and animal evidence from Irish deposits points instead towards tundra-steppe or park-tundra mosaics: grasses, sedges, herbs, mosses and low shrubs, with scattered wetter places and little tree cover. The exact vegetation around Doneraile cannot be reconstructed for 31,087 BCE alone, but it would have supported grazing and browsing animals rather than the dense Atlantic woodland that developed much later. Winters were severe; seasonal contrasts and wind exposure would have mattered greatly to every animal moving through the landscape.

Castlepook's Mixed Fauna

Castlepook Cave supplies the clearest direct window. Excavations and later reassessment have identified remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, stoat, collared and Norwegian lemmings, and spotted hyaena. No single list should be treated as a photograph of one moment. Material was recovered from a complex cave system, much of it excavated in the late nineteenth and early twentieth centuries, and some deposits were disturbed or mixed. The presence of later intrusive material is one reason why modern dating and re-examination are indispensable.

Nevertheless, the combination is powerful. Reindeer and lemmings are consistent with cold, open country; Arctic fox strengthens that impression. Mammoth and giant deer indicate that large herbivores could reach and live in the region during favourable phases. Wolves and spotted hyaenas reveal a predator and scavenger guild far removed from the fauna of historic Ireland. Hyaenas were not merely exotic visitors in an antiquarian collection: bones, teeth and coprolites from Castlepook show that carnivores used caves and had access to carcasses. A mammoth bone from the site also bears damage attributed to hyaena feeding.

The cave's name "Hyaena Hall" is therefore more than picturesque. It points to a landscape in which caves could be dens, scavenging stations, traps for bones carried in by animals, or shelters periodically occupied by people. The fossils cannot tell us which of those uses occurred in every chamber. What they can establish is that southern Ireland formed part of a mobile, cold-stage ecosystem. Animals did not recognise modern county boundaries, and their presence indicates repeated movement through a changing Atlantic-edge environment.

The Reindeer Bone and Human Question

The most arresting object for this period is a reindeer femur from Castlepook. It has been reported as bearing a mark interpreted as a cut or chop made with a stone tool, and the bone has been publicised as evidence for human activity in Ireland around 33,000 years ago. If that interpretation survives continued specialist scrutiny, it would be extraordinary: a rare trace of Upper Palaeolithic people at Europe's north-western margin, far earlier than Ireland's well-established post-glacial settlement record.

But the responsible conclusion is narrower. A radiocarbon measurement dates the death of an animal within a statistical range; calibration translates that measurement into calendar probabilities. It does not by itself date a mark, identify the person who made it, or demonstrate a camp, a hunt or a resident population. Equally, a sharp surface modification requires taphonomic assessment to distinguish a stone-tool action from damage caused by carnivores, sediment movement, excavation or later handling. Castlepook's complicated depositional history makes this caution essential.

There are no securely dated hearths, knapping floors, dwellings, burials, formal tools or art from Ireland that can be assigned to 31,087 BCE. It is therefore impossible to name a community, language, identity or territory. Nor can historians responsibly describe a political system, chiefs, warfare, diplomacy or religious practice. These are not omissions caused by lack of imagination; they are limits imposed by the evidence. The possible worked reindeer bone allows the prospect of a brief human encounter with a carcass. It does not yet permit a narrative of an Irish Palaeolithic society.

Life at the Edge of Evidence

If people did reach Ireland during this broad interval, comparison with Upper Palaeolithic groups elsewhere in north-west Europe suggests small, highly mobile parties capable of exploiting large animals and moving through seasonal landscapes. That is an interpretation from analogous regions, not a demonstrated description of Castlepook's visitors. They may have hunted reindeer, scavenged an animal killed by predators, removed meat, hide, sinew or marrow, or simply passed through. The single bone cannot decide between these possibilities.

There is similarly no evidence for farming, herding, pottery, metalworking, permanent villages, long-distance commercial exchange or monuments. "Economy" in the strict sense cannot be recovered. At most, the fauna shows the resources potentially available in the environment: mammal carcasses, hides, bone, antler, fat and perhaps seasonal opportunities along animal routes. Any exchange between human groups is unknown. The greater regional connection that can be observed is biological: the arrival and circulation of animals related to wider European populations.

Religion, learning and culture are also beyond direct reach. Ireland has no cave art or portable art securely attributable to this date. Caves certainly had practical significance for carnivores and possibly for people, but symbolic meaning cannot be inferred from their later names or dramatic interiors. The intellectually honest history of this period is therefore a history of landscapes and evidence: palaeontologists identifying species, geologists tracing ice, archaeologists testing marks on bone, and laboratories refining chronologies.

A Landscape About to Change

What gives 31,087 BCE its historical importance is what followed. During the Last Glacial Maximum, conventionally placed about 27,000–23,000 calibrated years before present for the British-Irish Ice Sheet at its greatest extent, ice covered Ireland and much of its continental shelf. Glacial erosion and deposition reshaped valleys, basins and lowlands, while advancing ice destroyed, buried or displaced many earlier deposits. That process helps explain why the evidence for any early human presence is so sparse and fragmentary.

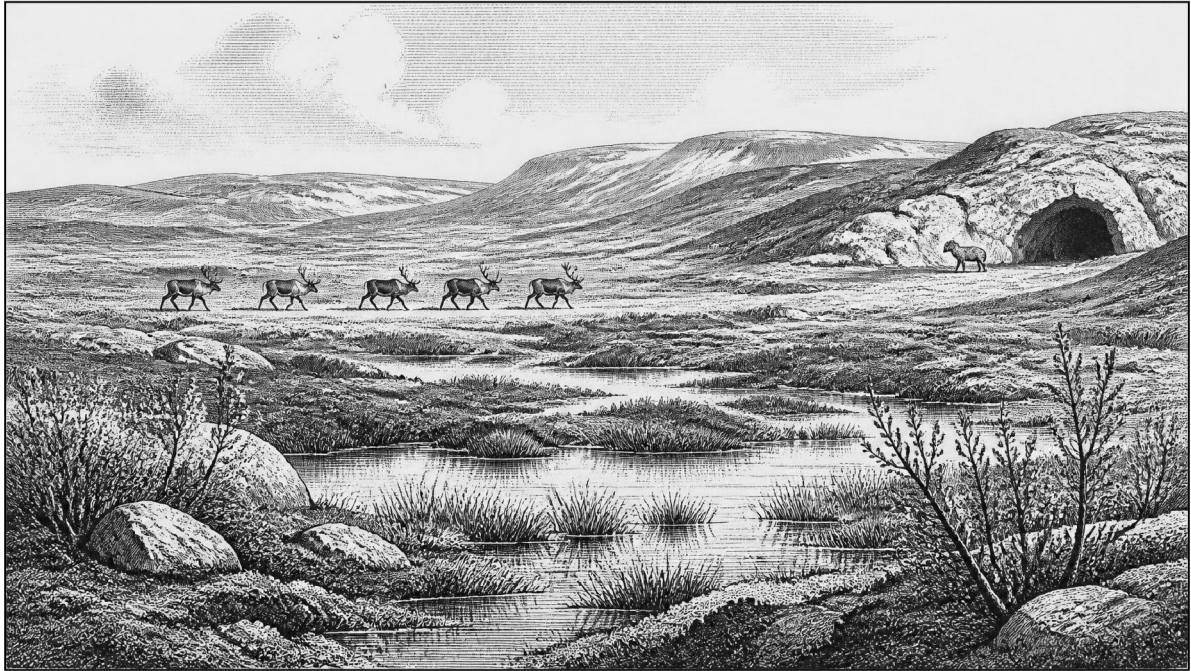
Castlepook's fauna records an Ireland before that maximum expansion: an intermittently habitable, open country where mammoths, reindeer and hyaenas could occur, and where a reindeer bone may preserve a human action. It is not a foundation story for later Irish peoples. Tens of thousands of years

separate this uncertain episode from the island's secure Mesolithic settlement, and the intervening ice transformed the physical world. Yet the cave matters precisely because it refuses the old image of an empty Ireland before the end of the Ice Age. It reveals instead a changing ecological frontier, and perhaps a fleeting human passage, just before the corridor narrowed beneath ice.

Chapter 015 of 100

31086 BCE

Castlepook's Narrow Window^[15]



“31,086 BCE” is a useful modern filing label, not a date at which an Irish event can be placed. No written calendar existed, and the archaeological record cannot distinguish one year from the next at this depth of time. In radiocarbon and palaeoclimate research, the relevant evidence is expressed in ranges, usually in years before AD 1950 and, where possible, calibrated calendar ranges. This article therefore considers Ireland broadly around 33,000 calendar years before present, in the later part of the Pleistocene and near the transition from Marine Isotope Stage 3 towards the colder conditions of Marine Isotope Stage 2. It describes a changing landscape, a small but remarkable fossil record, and a tantalising rather than settled question about human presence.

A Country on the Edge of Glaciation

Ireland at this time was not the familiar green, wooded island of later millennia. It lay within the climatic world of the North Atlantic Ice Age. The British–Irish Ice Sheet was growing, although its expansion was neither simple nor simultaneous in every region. Major syntheses place the main build-up after roughly 35,000–32,000 years ago, with maximum ice extent later, broadly between about 27,000 and 21,000 years ago. Those ranges should not be converted into a claim that every valley or coast in Ireland was ice-covered in 31,086 BCE. Dating former ice margins remains difficult, and local conditions could differ sharply.

The best responsible picture is therefore one of an increasingly severe, unstable cold-stage environment. Some areas may have remained exposed for a time while ice accumulated in uplands and spread across lowlands; elsewhere, older deposits were overridden, eroded or buried. The future ice sheet would radically remake the surface of Ireland, scouring bedrock, moving enormous loads of sediment and

leaving the drumlins, tills and meltwater landforms that structure much of the modern landscape. That destructive power also explains why evidence for any human activity of this age is so scarce: campsites on open ground were especially vulnerable to removal or deep burial.

Sea level was much lower than today because vast quantities of water were held in northern ice sheets. Yet low sea level did not automatically create a straightforward, dry route from Ireland to Britain or continental Europe. The geometry of the Irish Sea basin, changing ice margins, isostatic movements of the crust and the presence of glaciers all mattered. Animal movements into Ireland during the Pleistocene demonstrate that access was possible at certain times, but the precise routes and dates remain debated. It is safer to speak of intermittent ecological connectivity than to imagine a permanent road across a single exposed plain.

Two Uneven Archives

Two very different Irish records help illuminate the broader interval. At Derryvree near Maguiresbridge in County Fermanagh, an organic freshwater bed was found between glacial deposits. Its radiocarbon age of about 30,500 radiocarbon years before present is not an exact equivalent of 31,086 BCE, and calibration would place the sediment appreciably earlier in calendar years. Nevertheless, it is relevant evidence for the kind of cold, pre-maximum landscape that existed in Ireland during this phase of the last glaciation.

The Derryvree deposit contained plant and insect remains indicating open tundra or muskeg: sedges and grasses, mosses, herbs, dwarf willow, mountain avens, juniper and aquatic plants including bogbean. Open pools occurred amid wet, plant-rich ground. This was not a uniformly lifeless frozen desert. Summer thaw sustained shallow water, wetland vegetation and insects, while the wider setting was treeless and subject to long, cold winters. The evidence is local, from one protected sedimentary pocket in Fermanagh, not a complete map of the island. Still, it provides firmer footing than a generalised image of Ireland as blanketed everywhere by snow and ice.

Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, offers a complementary animal archive. Excavations conducted mainly between 1904 and 1908 recovered a large and complicated collection of bones. The cave deposits were accumulated, disturbed and excavated long before modern recording standards. Consequently, the bones cannot safely be treated as a single moment, a single living community or a neatly layered sequence. Recent redating has made some Castlepook animals substantially older than earlier measurements suggested, and has underlined the need to separate a bone's date from assumptions about its original context.

Reindeer Country and Carnivore Caves

Despite those qualifications, Castlepook confirms that Ice Age Ireland supported a richer mammal fauna than the later island. Its assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Some species need not have overlapped precisely, but together they demonstrate repeated episodes in which cold-adapted animals reached and occupied Ireland. Reindeer are especially evocative of open ground, seasonal movement and sparse forage; lemmings and Arctic fox point towards severe conditions. Mammoths and giant deer show that sizeable herbivores could use parts of the landscape.

Spotted hyaena deserves particular emphasis. A skull and other remains from Castlepook are the only secure Irish evidence for this formidable scavenger and hunter. Caves were not necessarily domestic shelters for people. They could be carnivore dens, traps, places where animals died naturally, water channels, or repositories into which bones were washed. Tooth marks, breakage, weathering and sediment movement may all alter an assemblage. The presence of hyaena at Castlepook is evidence for a Pleistocene carnivore landscape, not proof that people and hyaenas regularly confronted one another in the cave.

The living landscape beyond the cave probably varied seasonally between exposed herb-rich ground, wet hollows, streams and patches of more sheltered vegetation. Large animals would have been drawn to forage and water; predators and scavengers followed the opportunities those herds created. This is an interpretation grounded in the faunal and environmental evidence, rather than a direct observation of a particular Cork valley in this numbered year. Ireland's changing climate, terrain and ice margins would have made such habitats temporary, fragmented and often hazardous.

The Human Question

Castlepook matters to Irish history because one reindeer femur has been reported as bearing a mark consistent with cutting by a sharp stone tool. County Cork heritage material has presented the find as possible evidence that Upper Palaeolithic hunters processed a reindeer in Ireland around 33,000 years ago. If sustained, that would place human activity on the island far earlier than the previously established post-glacial evidence. It is an important proposition, but it must be stated at the right level of confidence.

The bone comes from an old cave collection, rather than a securely excavated occupation floor with tools, hearths, structures and tightly associated animal remains. A radiocarbon measurement dates the animal's death, not automatically the making of a surface mark, the location of carcass processing, or the duration of a human visit. Identifying a cut mark also requires taphonomic judgement: animal damage, sediment abrasion and excavation damage must be excluded. Current research at Castlepook has rightly sought surviving deposits, fresh samples, microscopic analysis, improved dating, cave survey and a better reconstruction of the old excavations.

Accordingly, it is not responsible to write of a settled Irish population, a named hunting band or a continuous Palaeolithic tradition in 31,086 BCE. Nor is there securely associated stone-tool assemblage from which to assign a culture. At most, the marked femur offers a potentially consequential indication of brief human handling of a carcass somewhere in the Castlepook landscape. It is evidence worth testing, not a licence to fill the island with imagined camps.

Society Without a Record

There is no evidence for political institutions, rulers, borders, diplomacy, organised warfare, formal religion, artistic traditions, trade networks or permanent settlements in Ireland at this date. The absence is meaningful: none can be reconstructed from the present record. If people did enter Ireland, they would have belonged to mobile Upper Palaeolithic hunter-gatherer worlds known elsewhere in north-western Europe, where food, shelter, fuel and movement were organised around highly seasonal conditions. But that wider comparison is context, not proof of what occurred in Ireland.

Likewise, no Irish economy can be described beyond the ecological possibilities suggested by fauna and landscape. Reindeer, hare and other animals could have been resources for any visitors; hides, bone, antler and fat would have had value in cold climates. Yet Castlepook has not yielded a demonstrable local

toolkit, dwelling, storage place or exchange good of this age. The most substantial “infrastructure” visible today is geological: cave chambers preserving fragments of a lost world, freshwater sediments beneath later till, and the glacial deposits that both record and obscure the period.

What This Date Can Mean

Around the notional year 31,086 BCE, Ireland was entering a harsher chapter of the last Ice Age. Its landscapes included cold open wetlands and ranges used at different times by reindeer, mammoths, hyaenas and other mammals. Glaciation was advancing towards its later maximum, while erosion and burial were already limiting what posterity could recover. Derryvree and Castlepook do not tell a year-by-year story; they provide dated windows of differing resolution. Their importance lies precisely in that restraint: they show an inhabited ecosystem and a possible human trace, while reminding us how much of Ireland’s deepest past remains beyond recovery.

Chapter 016 of 100

31085 BCE

Maguirebridge's Sedge Clock^[16]



Modern calendar precision cannot responsibly be projected onto Ireland in 31,085 BCE. Nobody in this landscape recorded years, and the archaeological and geological evidence cannot isolate a single season, let alone a particular day. The date is best treated as a point within a much broader Late Pleistocene interval: approximately 33,034 years before AD 1950, the conventional reference point for radiocarbon years. The strongest relevant Irish sequence, at Derryvree near Maguiresbridge in County Fermanagh, has a calibrated age range of roughly 36,900–31,700 years before present, or about 34,950–29,750 BCE. Thus 31,085 BCE falls inside the range, but is not an independently dated moment within it.

A Date Inside a Range

This was part of Marine Isotope Stage 3, a long and unstable phase of the last Ice Age. The Irish landscape was not simply an island buried beneath permanent ice. Climate repeatedly swung between severe cold and comparatively milder interludes, while glaciers grew, shrank and altered their routes. Terms such as “Derryvree Cold Phase” are useful archaeological shorthand, but they should not suggest a neatly bounded historical era. They describe a set of deposits and environmental conditions whose beginnings and endings remain uncertain.

The evidence closest to this nominal year comes from a road cutting made through a drumlin at Derryvree in 1969. Beneath a later sheet of glacial till, and above an older one, investigators found freshwater silts and fine sands containing organic matter. The position of this bed is crucial. A glacier had deposited the lower till; afterwards, water, sediment and plant remains accumulated in an ice-free setting;

then a later ice advance sealed the deposit under fresh till. Its radiocarbon determination, BIRM-166, was 30,500 radiocarbon years before present, with a substantial statistical uncertainty. Calibration transforms that measurement into a broad calendar range, not a precise BCE year.

Wet Ground Between Glaciers

Derryvree offers an unusually vivid environmental record. Pollen, plant macrofossils, mosses, insect remains and small animal evidence point to open, treeless tundra or muskeg: a waterlogged mosaic of sedges, grasses, herbs, mossy ground and shallow pools. Plants identified from the sequence include cold-tolerant types such as mountain avens, dwarf willow, bogbean and clubmoss. Juniper pollen was also recorded. These remains do not recreate a postcard view of all Ireland, but they establish what could grow at this north Fermanagh locality during part of the interval.

The landscape was harsh but not lifeless. Standing water and wet ground supported aquatic and marsh plants; exposed ground carried low vegetation rather than woodland. Seasonal contrast was probably pronounced. The original investigators described a periglacial climate, meaning one shaped by intense frost and freeze-thaw processes close to, but not necessarily under, glacier ice. Later syntheses have inferred very cold winters from the fossil assemblage. They do not, however, allow modern readers to assign an exact temperature or snowfall total to 31,085 BCE.

At the scale of the island, ice cover remains a matter for careful qualification. Derryvree shows that north-central Ireland was ice-free when its organic bed formed. It does not prove that every coast, mountain and lowland was simultaneously free of ice. Recent reconstructions of the British–Irish Ice Sheet use extensive landform, marine-core and dating evidence, yet emphasise that the geometry and timing of ice-sheet growth around 31,000 years ago are still less securely known than the later maximum and retreat. The most defensible picture is of a rapidly changing region: ice-free ground and wet tundra existed in at least some Irish areas before the great expansion that eventually covered much of the island.

Caves and Cold-Stage Animals

County Cork supplies a different kind of evidence. Castlepook Cave, near Doneraile and sometimes called Mammoth Cave, produced an important collection of Pleistocene bones during excavations led by Richard J. Ussher in the early twentieth century. Later studies and renewed radiocarbon dating have shown that its fauna represents more than one episode. The cave should therefore not be treated as a single, undisturbed deposit or as a snapshot of one year.

Its assemblage nevertheless demonstrates that a striking range of mammals reached southern Ireland during the broader pre-Last Glacial Maximum period. Identified remains include woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, Arctic fox, mountain hare, lemmings and spotted hyaena. Some animals were likely carried into cave passages by carnivores or washed and reworked by natural processes. Cave bones can reveal that species were present in a region, but they do not automatically show which animals shared one hillside at the same time, or whether people saw them.

Re-dating has materially changed the story. Improved pretreatment of bone collagen, particularly ultrafiltration, returned Castlepook dates thousands of radiocarbon years older than determinations made in the 1990s. This matters because older dates had once encouraged overly simple reconstructions of late-glacial animal arrivals. The revised evidence places some Castlepook fauna within Marine Isotope Stage 3

and indicates that species including giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum. Scientific progress here has not supplied certainty; it has instead made the chronology more accurate and the cave's mixed history more apparent.

The Reindeer Femur Question

A reindeer femur from Castlepook is especially relevant to a date around 31,000 BCE. County Cork heritage material describes it as a Palaeolithic bone of about 31,000 BCE and reports a deep fresh-bone mark interpreted by zooarchaeologist Ruth Carden as having been made during butchery with a sharp stone tool. If that interpretation is sustained, it would be extraordinarily important: potential evidence that a person processed a reindeer in Ireland far earlier than the previously accepted record of human presence.

Yet the distinction between evidence and interpretation is essential. The bone is direct evidence for a reindeer and for a mark on its surface. The claim that the mark was made by a stone implement is a specialist taphonomic judgement. Even an accepted cut mark would demonstrate an episode of carcass processing, not a permanent settlement, named hunting band or continuous Irish population. No securely associated Upper Palaeolithic hearth, house floor, stone-tool assemblage, burial, food store or occupation surface has been recovered at Castlepook for this period. Nor does the old excavation context permit the femur to be tied securely to a particular layer, season or calendar year.

The cautious historical conclusion is therefore limited but significant. Around the broader period represented by 31,085 BCE, people may have reached Ireland, perhaps briefly, within a wider north-west European world of highly mobile hunter-gatherers. Reindeer were a valuable potential source of meat, fat, hide, sinew, bone and antler. That statement describes known practices among Upper Palaeolithic groups elsewhere; it is not proof that a documented Irish community had an economy based on reindeer hunting. The Castlepook femur makes such an expedition plausible, rather than demonstrated.

No Politics, No Recorded Beliefs

There is no responsible basis for describing political affairs, warfare, diplomacy, leaders, tribes or territories in Ireland at this date. No language, personal name, symbolic system, grave, dwelling or monument can be assigned to 31,085 BCE. The same restraint applies to religion and learning. The wetland deposits reveal ecology, not ritual; animal bones reveal faunal presence and depositional histories, not myths or ceremonies. It would be misleading to fill those silences with later Irish traditions or with general ideas about Ice Age spirituality.

If people did visit, their social world would have been organised at a scale invisible in the present Irish record: small and mobile groups, rather than states or villages. Any crossings to or from Ireland depended on changing coastlines, sea levels, ice margins and navigable water routes. The evidence does not show whether a human party arrived over exposed terrain, crossed water, followed animals, or visited once rather than repeatedly. "Trade" and "diplomacy" are likewise unsupported; no imported artefacts or exchange networks have been identified for Ireland at this time.

An Island in Formation

The most important development was environmental rather than political. Derryvree records an interval when freshwater wetland and tundra life persisted between glacial episodes. Castlepook shows that Ireland, at least intermittently, lay within the range of large herbivores and formidable carnivores

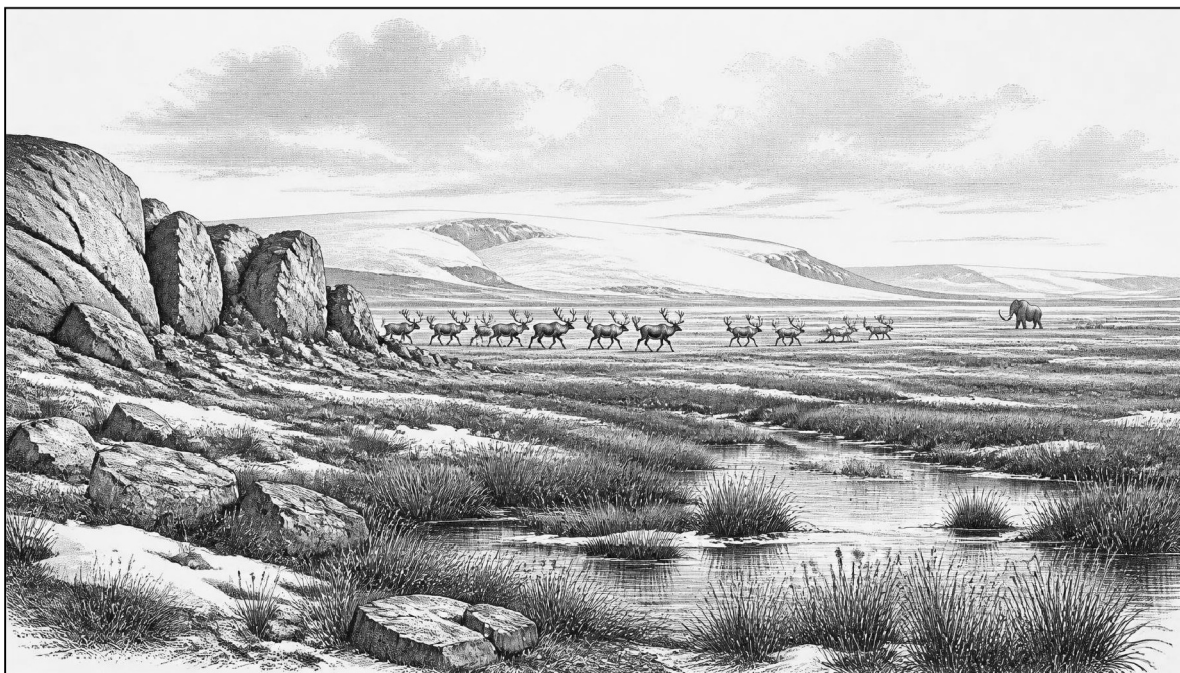
usually associated with Ice Age Europe. Crag Cave in County Kerry adds a further, independent climate archive: episodes of speleothem growth indicate times when liquid water could circulate underground, linked broadly to abrupt climatic shifts recorded across the North Atlantic region.

For 31,085 BCE, then, Ireland should not be imagined as either a settled prehistoric homeland or a featureless frozen blank. It was a changing cold-stage landscape with pools, sedges and mosses in Fermanagh; cave-dwelling carnivores and roaming large mammals in the south; and ice sheets not yet at their eventual greatest extent. Its human story remains a question rather than a settled fact. That uncertainty is not a weakness in the record. It is the central historical reality of Ireland at this immense depth of time.

Chapter 017 of 100

31084 BCE

The Castlepook Reindeer Femur^[17]



Modern calendar precision cannot responsibly be applied to Ireland in 31,084 BCE. No community on the island recorded years, no political chronology exists, and the surviving evidence is too sparse to identify an event on a particular day, season or even human lifetime. The date is best treated as a modern point within the later part of the Last Glacial Period, roughly 33,000 years before the conventional radiocarbon reference year of 1950. Archaeology and Quaternary science can illuminate a broad interval around it, but not a historical ‘year’ in the ordinary sense.

A Cold World in Transition

At this point Ireland lay within Marine Isotope Stage 3, a long cold phase marked by abrupt climatic oscillations across the North Atlantic. It was not yet the Last Glacial Maximum, when an expanded British–Irish Ice Sheet would cover most or all of the island. Yet the direction of change was towards harsher conditions and major ice-sheet growth. Ireland’s present shores, counties and road network are useless guides to the geography of that world. Much sea water was locked in continental ice, sea level was lower, and the outlines of coast, river and plain differed greatly from those of today.

The island was not necessarily one uniform frozen waste. The best reconstructions instead suggest a shifting mosaic: ice margins and uplands in some regions, open periglacial ground in others, meltwater channels, shallow pools, seasonally saturated sedge wetlands and exposed mineral soils. Snow cover, summer thaw and wind-blown sediment would have varied substantially between years and regions. The climate was severe, but severe does not mean lifeless. Cold-adapted plants and animals could exploit temporary refuges and open habitats before the full expansion of the ice sheet transformed the landscape again.

Recent ice-sheet syntheses reconstruct rapid growth of the British–Irish Ice Sheet after about 31,000 years ago, while also stressing that its margins were asynchronous and dynamic. That wider pattern matters more than any misleading image of an island suddenly swallowed by ice. Around this date, parts of Ireland may have remained ice-free or only intermittently affected, whereas other districts were increasingly shaped by glacial advance. The chronological resolution remains measured in centuries and millennia, not in a single numbered year.

Derryvree’s Buried Wetland

The most revealing environmental archive close to this broad horizon lies at Derryvree near Maguiresbridge, County Fermanagh. Road works there exposed organic silts and fine sands trapped between two substantial layers of glacial till inside a drumlin. The deposit is remarkable precisely because later ice did not remove it entirely. It preserves a freshwater episode between glacial advances: a small wetland landscape, subsequently sealed beneath renewed ice and sediment.

A radiocarbon determination from the organic deposit was reported as 30,500 radiocarbon years before present, with a sizeable uncertainty. When calibrated, scholarship has placed its probable age broadly at about 36,900–31,700 calibrated years before present. The modern label 31,084 BCE falls within that wide range, but this does not mean that the Derryvree plants grew in that exact calendar year. It means that the deposit offers a responsibly relevant window on conditions in north-central Ireland around this era.

The botanical evidence indicates treeless, cold-climate ground rather than forest. Sedges, mosses and other plants associated with wet, open and often Arctic-alpine conditions occurred around standing or slow-moving freshwater. Bogbean, water-milfoil, mountain avens, dwarf willow and clubmosses are among the kinds of remains discussed from this interval. Together they point to a tundra-like or muskeg environment: wet in sheltered hollows, low-growing in vegetation, and exposed to cold and frost. They do not justify reconstructing a continuous carpet of identical vegetation across Ireland. Rather, they demonstrate that a productive freshwater habitat could exist locally amid a generally cold, unstable landscape.

Such deposits also reveal how Ireland’s physical regions were changing. The drumlin itself records glacial action; the organic layer records an interruption or ice-free phase; the upper till records renewed glaciation. This sequence is evidence, not a simple climatic story. Scientists debate how far individual ice masses extended at particular moments and how reliable older radiocarbon measurements are for reconstructing ice limits. Still, Derryvree securely conveys a central fact: Ireland’s landscape was being repeatedly reorganised by the advance, retreat and reworking of ice.

Animals at Castlepook

County Cork provides the other major archive relevant to this period. Castlepook Cave, also called Mammoth Cave, near Doneraile contains Ireland’s best-known assemblage of pre-Last Glacial Maximum large mammals. Recoveries from early twentieth-century digging, and later discoveries in the cave system, have included woolly mammoth, reindeer, giant deer, bear, wolf, fox, Arctic fox, hare, lemmings and spotted hyaena. These animals were not necessarily contemporaries in one herd-filled valley. Cave deposits accumulated through many episodes, and bones could be moved, scattered, gnawed, redeposited or mixed during excavation.

Even with that caution, Castlepook demonstrates that southern Ireland was part of the wider north-west European world of cold-stage fauna. Reindeer could use open country and wetlands; mammoths and giant deer imply access to substantial grazing landscapes; foxes, wolves and hyaenas occupied predator and scavenger roles. Lemmings are especially eloquent indicators of cold conditions. The assemblage should not be turned into a documentary scene populated by every species at once, but it makes clear that Ice Age Ireland supported more ecological variety than the phrase ‘frozen island’ suggests.

Newer radiocarbon work has complicated the older chronology. Re-dating of Castlepook material showed that several earlier bone dates were too young, and suggested that some animals, including giant deer and spotted hyaena, may have disappeared locally before the Last Glacial Maximum, perhaps around 40,000 calibrated years ago. This is an important warning. The cave is a long archive, not a snapshot, and its famous fauna cannot be assigned wholesale to 31,084 BCE. Reindeer remains are highly relevant to the broad period; exact associations between individual specimens, animals and environmental episodes require careful testing.

The Marked Bone and Human Presence

A reindeer femur from Castlepook is especially significant because it bears a deep incision interpreted by some researchers as a mark made with a sharp stone tool during butchery. Public heritage accounts have associated the bone with roughly 31,000 BCE, making it potentially far older than the long-established post-glacial evidence for people in Ireland. If the interpretation is confirmed, it would show that a person or small group handled a reindeer carcass in Ireland during the Upper Palaeolithic.

That possibility must be distinguished from a proven settlement. A date obtained from bone establishes the age of the animal, within a calibrated probability range; it does not date the cut to an exact year. Identifying a surface mark as a stone-tool cut is a separate taphonomic judgement, requiring comparison with damage caused by carnivores, sediment movement, excavation and other natural processes. Nor has Castlepook yet produced a securely associated hearth, stone-tool assemblage, dwelling surface, human burial or undisturbed camp floor of this age. Recent excavation has sought surviving Pleistocene deposits precisely because such context is needed.

Accordingly, it would be wrong to describe Ireland in 31,084 BCE as securely settled. Equally, it would be wrong to dismiss the femur’s potential importance. The most cautious conclusion is that a brief human visit is possible and that the bone may preserve evidence of carcass processing. Such an episode would fit a wider Upper Palaeolithic Europe in which highly mobile hunter-gatherers followed seasonal resources across open landscapes. It cannot, however, establish a permanent population, a migration route, a language, ancestry or any named community in Ireland.

No Politics, but a Deep Landscape History

There is no evidence from which to reconstruct rulers, territories, diplomacy, warfare, law, religion or formal learning for this date. There are no Irish settlements, monuments, graves, art panels, ritual deposits or traded objects securely attributable to it. If people visited, their social organisation and beliefs are unknown. It is tempting to project later hunter-gatherer customs backwards, but that would be interpretation without Irish evidence.

The same restraint applies to economy and trade. A possible butchered reindeer bone may indicate the use of animal meat, hide, marrow or sinew, and it implies access to a cutting edge if the mark is genuinely human-made. Beyond that, no Irish evidence demonstrates exchange networks, routine hunting territories

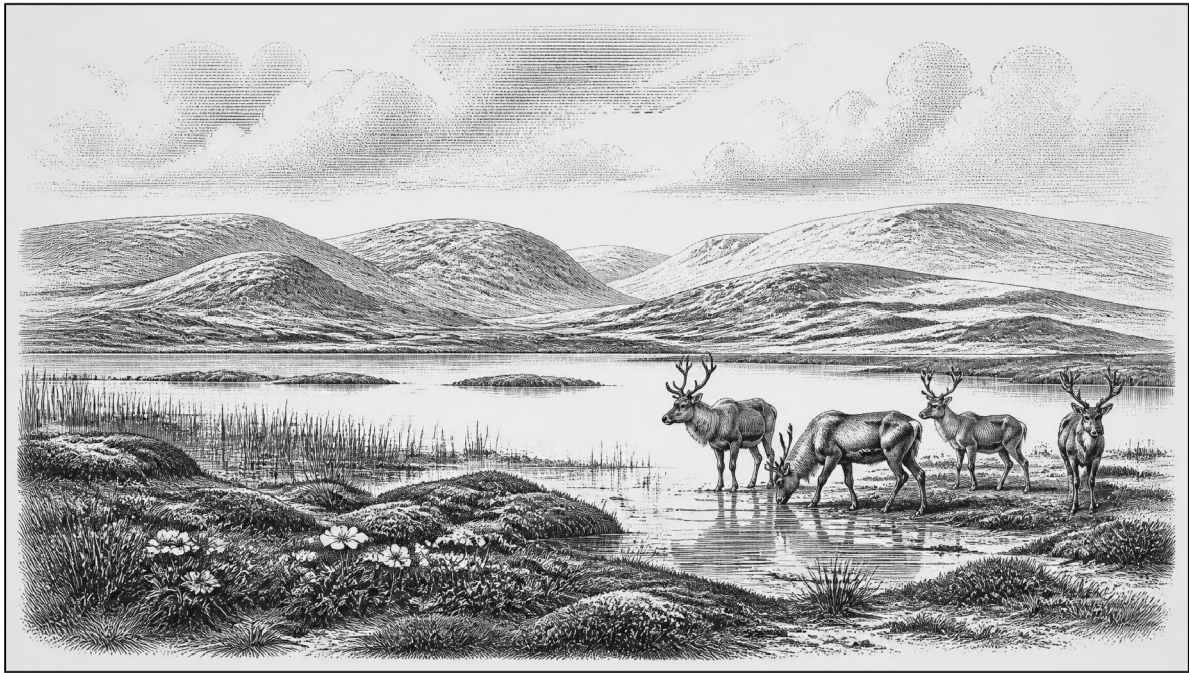
or seasonal camps. The strongest economic story is ecological: plants converted brief summer growth into forage; herbivores moved through open country; carnivores and scavengers exploited carcasses; freshwater patches provided concentrated resources in an otherwise demanding terrain.

What survives from around 31,084 BCE is therefore not an annalistic chapter but a set of difficult clues. Derryvree preserves wetland life between ice advances. Castlepook preserves the bones of mammals that lived in a colder Ireland before the landscape was radically remodelled. One marked reindeer femur raises the possibility of a human hand. Together they portray a country not yet historically knowable, but already environmentally complex: a place of tundra pools, animal movement, advancing ice and fragile evidence waiting to be tested.

Chapter 018 of 100

31083 BCE

Maguirebridge's Intertill Flora ^[18]



“31,083 BCE” is a modern chronological label, not a year that anyone in prehistoric Ireland could have named or recorded. No written calendar, dated event, ruler, settlement or individual can be recovered at that level of precision. In archaeological terms, the label points broadly to the later part of Marine Isotope Stage 3, a climatically unstable interval of the Late Pleistocene. The responsible history of Ireland at this depth in time must therefore be built from calibrated ranges, fossil deposits and probabilities rather than an annual chronicle.

The date lies roughly 33,000 calendar years before the conventional radiocarbon reference year of AD 1950, but that arithmetic should not be mistaken for precision. A conventional radiocarbon result measures radiocarbon years before present and must be converted through a calibration curve; its calendar equivalent is a range, sometimes a wide one. The current IntCal20 curve extends to 55,000 calibrated years before present, yet neither it nor any Irish deposit can identify an occurrence on one particular day, season or numbered year around 31,083 BCE.

An Unstable Ice-Age Ireland

This was Ireland before the fullest expansion of the last ice sheet. Later glaciation would reshape and strip much of the landscape, leaving a fragmentary record. It is misleading, however, to picture the entire island as a single, permanent white wilderness at this point. The evidence instead indicates regional and chronological variation: ice margins advanced and retreated, while some areas supported exposed ground, wetlands and freshwater basins during milder or less glacial phases. The central historical development was environmental instability on the north-western edge of Europe.

Sea level was substantially lower than today because enormous quantities of water were stored in continental ice. Ireland's coastlines and connections to neighbouring lands cannot be reconstructed as a fixed map for this one nominal year. Animal movements demonstrate that Ireland was ecologically connected to Britain and the wider European landmass during parts of the Late Pleistocene, but they do not prove a continuously open, easily traversed land bridge at 31,083 BCE. Routes may have changed with sea level, ice, rivers, coastal lowlands and local conditions.

Nor was the familiar green, wooded island present. The most defensible general picture is of cold, largely treeless terrain, with grassland and herb-rich open patches, dwarf shrubs, mosses, sedges and wet hollows. Frost action, short growing seasons and severe winters constrained vegetation. Such country could nevertheless be biologically productive in places: water margins and sheltered basins offered plants, insects and grazing, while open ground could support large herbivores. This was a shifting mosaic, not a uniform tundra plain.

Derryvree's Buried Wetland

The most informative Irish environmental evidence close to this broad timescale comes from Derryvree near Maguiresbridge, County Fermanagh. Road works exposed organic silts and fine sands trapped beneath a drumlin between glacial tills. The deposit produced the radiocarbon determination BIRM-166, conventionally reported as 30,500 radiocarbon years before present with a substantial uncertainty. Calibration places the evidence broadly in the mid-to-late 30,000s calibrated years before present, rather than at a pinpoint date. It is consequently relevant to the world represented by 31,083 BCE, not a diary entry from that year.

The Derryvree sediments are direct evidence that freshwater existed locally before later ice enclosed the deposit. Their pollen, plant macrofossils, mosses and insect remains support an interpretation of open, periglacial vegetation around pools and saturated ground. Fossils of bogbean (*Menyanthes trifoliata*), mountain avens (*Dryas octopetala*) and lesser clubmoss (*Selaginella selaginoides*) are particularly useful because they indicate cold-adapted wetland and open-ground communities. They do not provide a complete map of Ireland, but they firmly reject any simple claim that the country was everywhere covered by thick, permanent ice.

The term "muskeg" is sometimes used as a modern ecological comparison for this sort of wet, mossy, sedge-rich terrain. It should remain a comparison, not a literal reconstruction. What the buried material securely demonstrates is a freshwater environment and a local assemblage of plants and small animals; the wider image of a tundra-wetland mosaic is an interpretation based on those remains, sedimentary context and comparison with other north-west European cold-stage landscapes. Such distinctions matter because Derryvree is among the rare Irish deposits to survive the destructive work of later ice.

Cork's Cave Fauna

Limestone caves in southern Ireland provide a second, very different archive. Castlepook Cave, near Doneraile in north County Cork, yielded Ireland's principal assemblage of pre-Last Glacial Maximum vertebrate remains. Reassessment of the old collections and improved radiocarbon dating have shown both their importance and their difficulty. Nineteenth- and twentieth-century excavations disturbed deposits; cave sediments were affected by carnivores, water and collapse; and bones from different episodes may have become mixed. A cave collection is not automatically a single contemporaneous animal community.

Even so, the Castlepook record establishes that a varied cold-stage fauna reached Ireland during parts of Marine Isotope Stage 3. Dated and identified material includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena. Some of these animals belong to periods earlier than the notional date under discussion, and their presence in the collection must not be turned into a census for 31,083 BCE. The important conclusion is more restrained: Ireland contained, at changing times, habitats capable of supporting large grazers and browsers, smaller cold-adapted mammals, predators and scavengers.

That faunal evidence also changes how caves should be understood. Castlepook was not necessarily a home or hunting camp for every creature represented in it. Hyaenas and other carnivores could drag bones into shelters; floods could move material; animals could die naturally in or near cavities; and excavators could merge deposits that were originally separate. Taphonomy—the study of what happened to remains between death and recovery—is therefore essential. It prevents dramatic but unsupported stories about mammoths, hyaenas and people meeting in one cave at one time.

The Reindeer Bone Question

The most consequential possible human trace near this broad period is a reindeer femur from Castlepook. County Cork heritage interpretation has presented it as approximately 31,000 BCE, and Ruth Carden has identified a deep surface modification as a mark made by a sharp stone tool during carcass processing. If that assessment is confirmed through continuing specialist scrutiny, it would suggest that people handled a reindeer in Ireland far earlier than the long-recognised evidence for post-glacial settlement. It is an important proposition, but it must remain conditional.

A radiocarbon date establishes the age of the animal bone within a range; it does not independently date the incision, identify its maker or show where the animal died. Equally, a possible cut mark requires a separate taphonomic judgement, distinguishing human tool damage from carnivore activity, trampling, sediment movement, excavation damage and later handling. The femur derives from an old cave collection, not from a modern excavation of an intact occupation floor. No securely associated hearth, stone-tool assemblage, dwelling, burial, food-processing area or repeated sequence of occupation has been published for Ireland at this age.

The most that can responsibly be inferred, if the mark is anthropogenic, is an episode of human contact with a reindeer carcass by people able to use a sharp lithic edge. It could represent a short visit by a small mobile group, rather than a resident population. It cannot establish whether people hunted the animal, scavenged it, removed hide, meat, sinew or marrow, travelled from Britain or continental Europe, or left descendants in Ireland. The evidence is tantalising precisely because it is so slight.

No Politics, No Proven Settlements

There is no basis for political history in the ordinary sense. Ireland at this point has no known kingdoms, leaders, laws, boundaries, diplomacy, warfare, ports or formal institutions. There is likewise no Irish evidence from which to reconstruct language, kinship rules, religious rites, art, formal learning or social rank. Such absences do not prove that any people who may have visited lacked beliefs, stories, practical knowledge or social relationships. They show only that the surviving archaeological record cannot describe them.

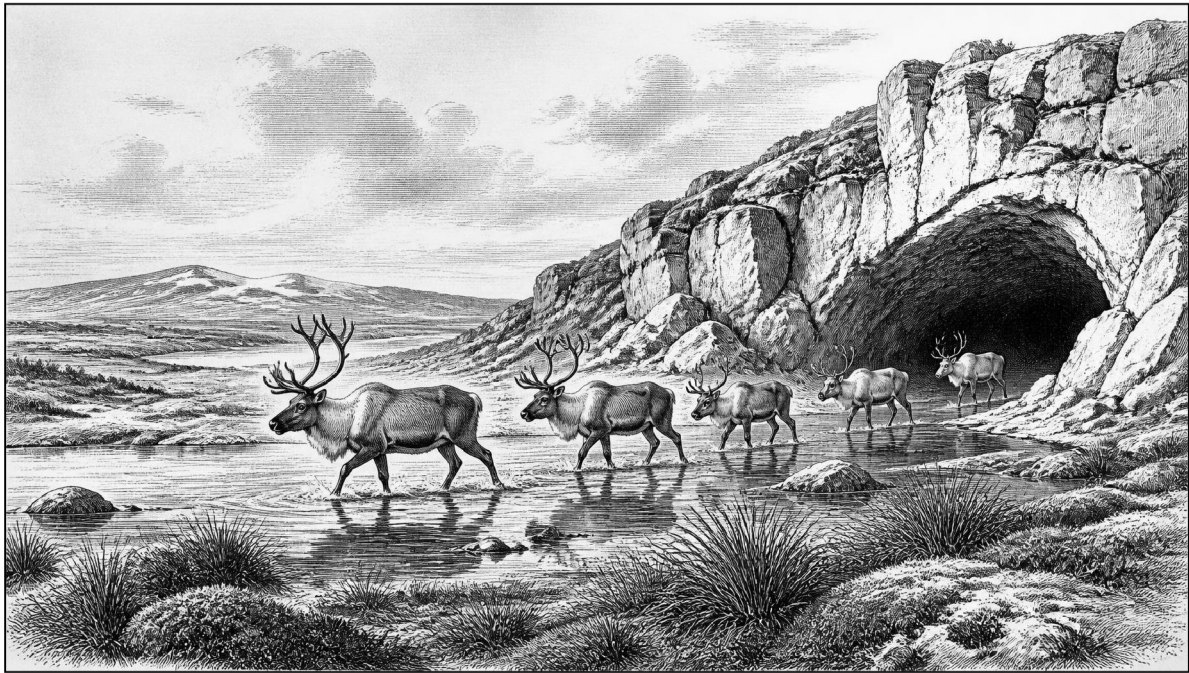
There is also no demonstrated economy of farming, herding, trade or permanent settlement. Agriculture and domestic livestock lay many millennia in the future. If people entered Ireland during a favourable interval, their subsistence would most plausibly have resembled that of mobile Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe: careful knowledge of weather, animal movement, stone, fuel, shelter and seasonal risk. Yet this is a comparative model, not a documented Irish way of life. Castlepook supplies no recovered toolkit from which to reconstruct a local technology or exchange network.

For this reason, the most important development around the modern label 31,083 BCE was neither political nor cultural in the later historical sense. It was the creation of an intermittently habitable Ice-Age frontier. Derryvree's buried freshwater flora shows that cold wetlands and open ground existed in at least one northern setting; Castlepook's bones show that large mammals and predators reached southern Ireland during the wider interval; the marked reindeer femur raises, but does not settle, the question of human presence. These small, difficult archives are the proper foundation for Ireland's history at the threshold of the last great ice advance.

Chapter 019 of 100

31082 BCE

Castlepook's Reindeer Crossing^[19]



31,082 BCE is a modern calendar label, not a date that people in Ireland could have named or recorded. No event, ruler, community or journey can responsibly be assigned to this single year. At this depth of time, the useful scale is not an annum but a broad Late Pleistocene interval measured through sediments, animal remains, cave deposits and scientific dating. The year falls within Marine Isotope Stage 3, a long, climatically unstable part of the last glacial cycle, before the Last Glacial Maximum covered much of Ireland with an extensive ice sheet. The evidence suggests a cold and changing island environment, occasionally capable of supporting freshwater habitats and large mammals, but it does not furnish an annual chronicle.

A Date Beyond Calendar Precision

The distinction between radiocarbon years and calendar years is especially important here. A conventional radiocarbon determination is not a direct calendar date: atmospheric carbon levels changed through time, so results require calibration against independently dated records. IntCal20, the principal Northern Hemisphere calibration curve, reaches back to 55,000 calendar years before present, but its wide uncertainties at this age mean that a result can correspond to a substantial calendar range rather than a point on a timeline.

The closest important Irish environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. There, organic-rich freshwater sediments lie between two tills: the unsorted debris left by separate glacial advances. The sequence demonstrates an earlier phase of ice occupation, an interval in which water, plants and animals occupied the locality, and a later advance that sealed the deposits.

Organic material produced a conventional age of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. It is therefore reasonable to discuss Derryvree as evidence from the broad period around this nominal year, but not to claim that its pond or marsh existed specifically in 31,082 BCE.

That caution shapes the whole story. Ireland was not uniformly frozen, uniformly habitable or environmentally static throughout the Late Pleistocene. Ice margins advanced and retreated at different times; severe cold alternated with comparatively milder episodes; and evidence from one cave or basin may represent a brief episode rather than the condition of the whole island. The later maximum of the British–Irish Ice Sheet is much better constrained than the earlier part of this history, with major expansion occurring after this period and deglaciation beginning far later.

Fresh Water Between the Ice

Derryvree is valuable because it preserves organisms as well as sediment. Its flora included freshwater mosses and sedges, while its insect assemblage indicated cold conditions of northern character. These are direct observations from a particular wetland setting. They support an interpretation of open, treeless or very sparsely wooded ground around pools, marshes and slow water, rather than of a forested Ireland. They do not show the entire island as one continuous tundra, nor do they prove the weather in a particular season.

Related deposits at Hollymount near Maguiresbridge and Greenagho near Belcoo reinforce the larger conclusion that parts of Fermanagh experienced non-glacial intervals during the Midlandian glaciation. Such sequences are rare survivals. Subsequent ice, frost action, erosion and the practical difficulty of locating buried deposits have erased much of the landscape's earlier record. A wet hollow protected beneath later till can therefore tell historians more about this remote Ireland than a much larger area of exposed ground.

South-western Ireland provides a different kind of environmental evidence. Uranium-thorium dating of broken and reworked cave calcite from Crag Cave, County Kerry, records episodes of speleothem growth in the latter part of MIS 3. Because calcite growth requires water moving through cave systems, the record supports the conclusion that glacial-age climate was punctuated by ameliorations rather than consisting of unbroken, permanently frozen conditions. It cannot be converted into a description of daily life, but it helps explain how freshwater habitats and grazing animals could intermittently occur in Ireland before the later ice-sheet maximum.

The Castlepook Fauna

The most evocative evidence comes from Castlepook Cave near Doneraile, County Cork, also known as Mammoth Cave. Early twentieth-century excavations recovered a very large and complicated animal assemblage from galleries given memorable names such as Hyenahall and Elephant Hall. The cave has produced remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Castlepook is the richest Irish site for vertebrate evidence from the period leading towards the Last Glacial Maximum.

Yet the cave is not a photograph of one Ice Age day. Bones were excavated from different galleries and deposits; some had been moved by carnivores, water or older excavation practices; and redating has shown that certain earlier measurements were thousands of radiocarbon years too young. Modern

reassessment places parts of the assemblage securely in MIS 3, while individual dated remains span a long interval. Accordingly, it is unsafe to imagine every recorded species meeting at Castlepook in 31,082 BCE, or to turn the cave into a single, simultaneous ecosystem.

Nevertheless, the fauna establishes something important. Reindeer and giant deer could exploit open vegetation; mammoth confirms that Ireland at times formed part of a wider north-west European world of cold-adapted large mammals; and hyaena, wolves and foxes indicate a predator and scavenger community far removed from the modern Irish fauna. Spotted hyaena is especially striking because Castlepook remains the only securely recorded Irish locality for it. The presence of these animals demonstrates dispersal into Ireland in favourable phases, although the precise routes, shoreline configurations and duration of populations remain matters for research rather than certainty.

A Reindeer Bone and the Human Question

One Castlepook object has made this period unusually important in Irish archaeology: a reindeer femur carrying a deep incision interpreted by palaeozoologist Ruth Carden as a cut made with a sharp stone tool during butchery. County Cork's heritage publication presents the bone as roughly 31,000 BC and regards it as potential evidence of Palaeolithic hunters handling reindeer. If that interpretation and association are sustained, it would push evidence for human activity in Ireland dramatically earlier than the formerly secure Late Upper Palaeolithic record.

The proper conclusion is deliberately narrower. A marked bone may record the processing of one carcass; it does not demonstrate a village, a permanent settlement, a named people or a continuous population. No securely associated hearth, stone-tool assemblage, dwelling surface, burial or repeated kill-site has been found at Castlepook. Nor can the cave itself be assumed to have been the place of slaughter: carnivores may have carried remains into it, and cave deposits have complex histories. The mark is a serious and exciting claim, but it is not licence to populate Ireland with an invented hunting band.

No Politics, No Recorded Beliefs

There is no evidence for political authority, warfare, diplomacy, trade partnerships, farming, metalworking, writing or formal religion in Ireland at this time. It would be misleading to supply them merely because a year-by-year history usually expects such headings. If people did visit or briefly inhabit the island, comparison with contemporary Upper Palaeolithic groups elsewhere in Europe suggests highly mobile foraging may be plausible; it does not prove their language, kinship, ritual, clothing, technology or beliefs in Ireland.

Economically, the material record supports only the possibility of hunting and carcass processing, not a documented local subsistence system. There are no known crops, domestic animals, fields, houses, pottery workshops or exchange goods from this Irish horizon. Lower sea levels altered coastlines and the geography of surrounding shelves, but neither a simple land bridge nor a particular crossing route should be assumed from the animal evidence alone. Ireland's relationship with Britain and continental Europe changed repeatedly with ice, sea level and local uplift, and remains an active subject of palaeogeographical reconstruction.

An Ireland of Fragments

The enduring significance of the period is therefore environmental and methodological. Derryvree preserves a cold freshwater world between phases of glaciation. Crag Cave records episodes when water moved through the karst landscape. Castlepook preserves the remains of animals that crossed into, or survived for a time in, a very different Ireland from today, alongside a tantalising possible trace of human butchery. Together these fragments show that Ireland before the Last Glacial Maximum was neither a timeless blank nor a fully knowable prehistoric society.

For 31,082 BCE, that is the responsible historical picture: not a dated event, but a broad window onto an unstable Ice Age landscape. Open wetlands in Fermanagh, limestone caves in Cork, large herbivores and carnivores, shifting ice and water, and perhaps a brief human encounter with a reindeer are all more defensible than any story of kingdoms, customs or calendar dates. The evidence is sparse, local and often reinterpreted; its very limits are part of what this remote chapter in Ireland's past means.

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31081 BCE

Derryvree's Living Silt^[20]



“31,081 BCE” is a modern chronological label, not a year that anyone in Ireland could have named or recorded. At this depth in time, modern calendar-year precision is unavailable. The label falls roughly 33,030 years before AD 1950, the conventional reference point for radiocarbon chronology, within the Late Pleistocene and Marine Isotope Stage 3. It is more responsible to use calibrated ranges and long environmental phases than to claim an event occurred in this particular year. Ireland’s evidence comes not from writing, monuments or settlements, but from layers of sediment, pollen, plant remains, insects, animal bone, cave deposits and the traces left by expanding ice.

The most illuminating Irish archive for the broad period is at Derryvree, near Maguiresbridge in County Fermanagh. Here, roadworks in 1969 cut through a drumlin and revealed organic freshwater silts and fine sands lying between two thick beds of glacial till. The dated material, BIRM-166, produced an age of 30,500 radiocarbon years BP, with a large statistical uncertainty. When calibrated using modern curves, it belongs broadly to the later part of MIS 3, approximately 36,900–31,700 calibrated years BP. That range encompasses the notional date of 31,081 BCE, but the deposit accumulated over time: it is an environmental record, not a dated annual chronicle.

Freshwater Beneath the Ice

Derryvree’s position between tills is its great significance. Till is debris deposited by glacier ice. The lower till indicates an earlier glacial advance; the organic sediment records an interval in which the locality was free of overriding ice long enough for freshwater, mud and living communities to develop; the upper till shows that ice returned later and sealed the evidence. The sequence therefore disproves any simple picture of an Ireland continuously buried beneath one unchanging ice sheet. At least in south Fermanagh, the relevant broader interval contained a severe but functioning cold-climate landscape.

The scientists who studied the material described a full-glacial flora and fauna and interpreted the setting as open tundra under a periglacial regime. Periglacial does not mean that the ground itself lay beneath glacier ice. It denotes conditions shaped by persistent cold, frost, seasonal freezing and thaw, sparse cover and short growing seasons, often close to an ice margin. Derryvree was not the familiar green, wooded Ireland of later millennia. Nor should it be imagined as lifeless white desert. Its shallow waters and saturated ground supported a specialised wetland mosaic.

Sedges, Mosses and Open Water

Pollen at Derryvree was poorly preserved, but plant macrofossils, mosses and insect evidence supplied a richer local picture. Sedges, grasses and herbs grew around pools and wet hollows. Finds reported from the sequence include bogbean, dwarf willow, mountain-avens, lesser clubmoss and water-milfoil, alongside a notable moss flora. Collectively, they support the interpretation of low, open vegetation, freshwater margins and waterlogged ground rather than forest. A few grains of tree pollen do not demonstrate woodland nearby: pollen may travel far, and the broader assemblage points towards treeless conditions.

For creatures small enough to live among moss, sedge and shallow water, this was an intricate landscape. Insects and plant remains indicate that even a cold terrain contained sheltered microhabitats, summer growth and food webs. Yet the evidence also conveys constraint. Thin vegetation, exposed ground and long winters would have limited biomass. The useful modern analogy is not a direct replica of any one Arctic place, but a muskeg-like tundra: wet, uneven ground, patches of open water, mossy vegetation and frost-affected soils. Such ground could change rapidly with season, drainage, snowfall and temperature.

An Island Approaching Transformation

At around 33,000 calibrated years ago, Ireland was entering the long deterioration that led towards the Last Glacial Maximum, rather than already standing at its coldest and most extensive phase. Reconstructions of the British–Irish Ice Sheet place major growth after roughly 35,000–32,000 years ago and its maximum extent principally between about 27,000 and 21,000 years ago. Newer modelling stresses regional variation and incomplete evidence: at about 31,000 years ago, ice caps and glaciers likely occupied some Irish uplands while other areas remained ice-free, and the exact limits changed through time.

That regional variation matters. Derryvree cannot be treated as a map of the whole island, still less as a precise description of County Cork or every coastal plain. In the north-west, a cold freshwater basin could persist between advances; elsewhere, glaciers, exposed upland, rivers, cave entrances or changing shorelines created different local conditions. Later ice repeatedly eroded, buried and rearranged the older landscape. This destructive history is one reason Ireland has such a fragmentary record for the period: potential campsites, soils and riverside surfaces may have been removed or concealed beneath younger deposits.

Castlepook's Animal Archive

In north County Cork, Castlepook Cave near Doneraile preserves a different sort of testimony. Cave deposits and old museum collections have yielded a rich pre-Last Glacial Maximum fauna, including reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. The bones were accumulated across changing episodes by animals, water, natural deaths and early excavation, not deposited as one simultaneously living community. They show that Ireland formed part of a wider north-west European animal world during favourable phases of the Late Pleistocene; they do not prove that every listed species stood together in one valley in 31,081 BCE.

The cave fauna nevertheless gives scale to the ecological possibilities. Reindeer imply open country and mobile grazing herds. Large carnivores and scavengers, especially spotted hyaenas, reveal access to substantial prey and denning places. Mammoth and giant deer are reminders that Ice-Age Ireland possessed animals absent from the later island. Recent re-dating has shown that several earlier radiocarbon determinations from Irish caves were too young, underlining a central lesson: Pleistocene collections require continual reassessment as laboratory methods improve. Ages from bones date the death of an animal, not necessarily the moment when a cave deposit formed or a mark was made.

The Human Question

Castlepook is especially important because a reindeer femur in the National Museum of Ireland's Natural History collection bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool on fresh bone. County Cork heritage material associates the object with about 31,000 BC. If the mark is confirmed as human butchery, it may represent an extraordinarily early Irish Palaeolithic trace, far older than the securely demonstrated terminal-Pleistocene human interaction at Alice and Gwendoline Cave in County Clare.

That possibility must be stated with care. The Castlepook specimen was not recovered in a modern excavation beside a securely associated hearth, stone-tool assemblage, dwelling floor or human remains. The cave's historic collections were disturbed and mixed, and natural processes can modify bone surfaces. A single marked femur cannot establish a resident population, a permanent camp, the size of a hunting party, a route of arrival or a season of activity. It may record a brief encounter between people and reindeer; it may yet require reinterpretation. The evidence supports investigation, not a settled narrative of colonisation.

Society Without a Recorded Society

Accordingly, there is no defensible political history for Ireland at this point. No named communities, rulers, territories, conflicts, treaties or diplomatic relations can be recovered from the evidence. There is likewise no material basis for describing religion, formal learning, language, art, kinship systems or burial custom. Even if people briefly visited during the wider period, their social life cannot be read from one possible butchery mark. The absence of evidence is not proof that no human ever crossed this landscape, but it means that archaeologists cannot demonstrate an established human society in Ireland around this modernly numbered year.

Nor can economy and trade be used in their later historical senses. There are no farms, crops, domestic animals, stores, markets, exchange goods or durable settlements known from Ireland at this age. Animal movements between Ireland, Britain and continental Europe were ecological dispersal, not trade. Lower sea levels, shifting coastlines, exposed shelves and ice-associated corridors altered the possibilities of movement, but scholarship does not establish one permanent land route or a particular crossing in 31,081 BCE. Faunal presence shows connectivity over long spans, not an itinerary.

A History of Ranges

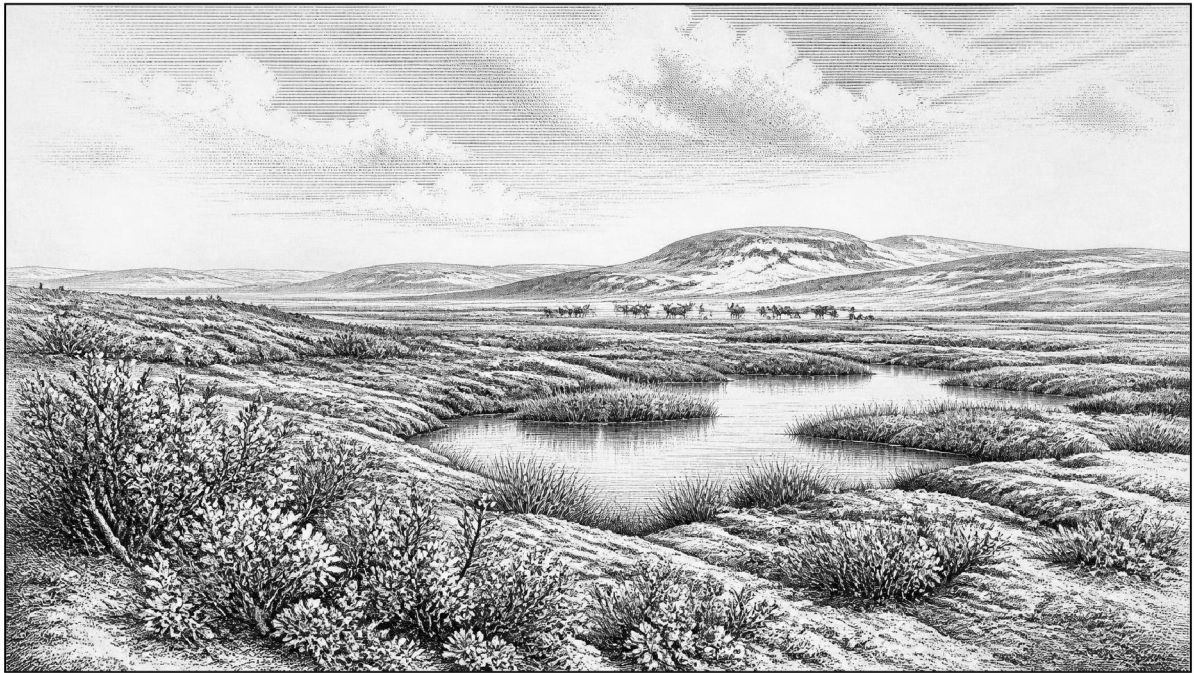
The most meaningful development around this date was environmental instability. Ireland lay on the north-western edge of Europe, increasingly affected by falling temperatures and expanding ice but not reducible to an ice-covered void. Derryvree records freshwater and tundra vegetation within a cold, locally ice-free interval; Castlepook demonstrates that large mammals reached Ireland during the wider pre-maximum period; glacial research shows that a profound reorganisation of terrain was approaching. These were changes measured in centuries and millennia, beyond the resolution of a single BCE year.

For Ireland in 31,081 BCE, then, the honest historical picture is precise in method rather than falsely precise in date. There were wet, treeless and frost-affected habitats in at least some places; cold-adapted plants and animals occupied parts of the landscape; glaciers had advanced before and would advance again; and a provocative bone from Cork raises, but does not settle, the prospect of very early human activity. The surviving record is slender, but it preserves a compelling Ireland: biologically active, climatically harsh and on the threshold of a far more extensive glaciation.

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31080 BCE

BIRM-166's Reindeer Question ^[21]



The label 31,080 BCE is a modern chronological convenience, not a year that any person in prehistoric Ireland could have named, recorded or experienced as a calendar date. It falls roughly 33,030 years before the conventional radiocarbon reference year of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3, a particularly unstable part of the last Ice Age. Evidence from Ireland cannot resolve events to this single year. What it can provide are radiocarbon ranges, geological sequences, plant fossils and animal remains that illuminate a changing Irish environment around this broad period.

A Date Within a Range

The closest major Irish environmental record is Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 exposed an unusual sequence inside a drumlin, the streamlined hill-form created by glacier ice. An older till lay below freshwater sands, silts and organic material; another till sealed the deposit above. The order is clear evidence of change: ice had crossed the locality, a later interval allowed freshwater sediment and living things to accumulate, and renewed glaciation buried the wetland.

Organic material from this deposit, known by the laboratory number BIRM-166, returned a conventional radiocarbon age of about 30,500 BP, with a substantial error range. Radiocarbon years are not calendar years. Changes in atmospheric carbon mean that measurements must be calibrated, and beyond 30,000 years ago the resulting ranges become broad. The Derryvree material has commonly been placed at approximately 36,900–31,700 calibrated years BP, or about 34,950–29,750 BCE. The requested year lies inside that long span, but it cannot be assigned to a particular layer, pool, animal, season or human visit.

This distinction is fundamental. Derrynree is not a diary of 31,080 BCE; it is a surviving environmental archive accumulated over an interval. Nor can one Fermanagh cutting stand for the whole island. Yet it decisively challenges any simple picture of Ireland as continuously ice-covered throughout the Ice Age. For part of the Middle Midlandian, there was an ice-free freshwater landscape at this northern site, though one exposed to severe cold and eventually overwhelmed by later ice.

Wetland on a Cold Margin

The Derrynree fossils indicate open, treeless tundra or tundra-like vegetation. Plant remains include bogbean (*Menyanthes trifoliata*), dwarf willow (*Salix herbacea*), mountain avens (*Dryas octopetala*) and alternate water-milfoil (*Myriophyllum alterniflorum*). These are not a list of plants that necessarily flourished together in every corner of Ireland in the named year. They do, however, establish a cold freshwater setting in which shallow water, sedges, mossy ground, low-growing shrubs and herb-rich patches could persist.

Such country should not be imagined as either a green modern Ireland or an unbroken desert of snow. In the short growing season, wet margins could support aquatic plants and insects, while exposed ground supported sparse but resilient vegetation. Frost, wind, seasonal freezing and thin soils would have placed hard limits on plant cover. The landscape was shaped not only by climate but by the legacy of earlier ice: hollows, poorly drained ground, gravel, silt and newly rearranged sediments affected where water collected and where plants could take hold.

There is no evidence here for farms, fields, livestock, houses, cleared woodland or permanent village life. Agriculture lay many millennia in the future. The economic reality demonstrated by the deposit is ecological rather than social: primary productivity in a demanding northern environment, available to animals adapted to cold and open ground.

Animals of the Cave Country

Southern Irish caves provide a complementary, though complicated, record. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, yielded an important collection of Pleistocene bones. The broader cave fauna includes remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These remains show that Ireland was reached by elements of the wider north-west European cold-stage fauna during the Late Pleistocene.

They must not be turned into a single illustrated scene. Cave deposits may accumulate over many thousands of years; old excavations did not always preserve the stratigraphic information expected today; and some remains have been shown by improved dating to be older than formerly thought. A mammoth, a hyaena and a reindeer found in one cave system do not prove that they met at one place or time. The responsible conclusion is narrower: the island supported, at different points within this long glacial interval, a richer large-mammal community than later historical Ireland.

Predation and scavenging formed part of that ecology. Spotted hyaenas could carry and modify bones, while caves might serve as dens, traps, shelters or places where water and sediment concentrated remains. The evidence records animal lives and deaths far more securely than it reveals an orderly food chain. It nevertheless makes clear that Ireland was not ecologically empty.

The Reindeer Mark

Castlepook matters especially because a reindeer femur from the old collection has been reported to bear a deep incision interpreted by zooarchaeologist Ruth Carden as a cut or chop made on fresh bone with a sharp stone tool. County Cork heritage material associates the specimen with about 31,000 BCE. If that interpretation and chronological association are sustained, the bone may preserve an exceptionally early indication that people handled and processed an animal in Ireland.

Its importance requires caution rather than embellishment. A radiocarbon determination dates the animal bone, not the exact instant at which a surface mark was made. Identifying a mark as a stone-tool cut is a separate taphonomic judgement: carnivore damage, breakage, abrasion and later disturbance must be excluded. Above all, the bone was not recovered from a modern, closely recorded occupation floor accompanied by a hearth, tools, butchered assemblage, dwelling, human burial or preserved food store.

Consequently, Castlepook cannot yet demonstrate a permanent population, a named archaeological culture, a route of arrival, language, ancestry or continuity with later Irish communities. It does not prove that a camp stood at the cave in 31,080 BCE, nor even that the carcass was killed at the cave. At most, it offers a potentially momentous but currently limited trace of human activity: one animal may have been butchered by one or more people during a much wider Late Pleistocene interval.

Society Beyond Recovery

There can be no evidence-based account of political affairs, diplomacy or organised conflict in Ireland for this date. No communities are named; no territory is defined; no settlement is securely known. It would be misleading to turn the possible reindeer processors into a tribe, nation or lineage. If people were present, they may have been highly mobile foragers making a brief use of a landscape shared with dangerous predators and large herbivores. That is an inference from the possible bone modification and the wider Upper Palaeolithic world, not a fact demonstrated by an Irish settlement.

The same restraint applies to religion, culture and learning. No Irish artwork, ornament, burial rite, musical object, ceremonial place or symbolic practice can presently be dated to this horizon. Silence in the archaeological record is not proof that people lacked beliefs or knowledge; it is simply the limit of what has survived, been found and securely dated. A single cut-marked femur cannot reveal speech, kinship, ritual or story.

Approaching the Great Ice

The date also belongs to a phase before the fullest development of the Last Glacial Maximum, generally placed later, around 26,000–19,000 years ago. Reconstructions of the British–Irish Ice Sheet show that ice expansion was dynamic, regionally uneven and still under revision. By around 31,000 years ago, ice was growing strongly in parts of the wider British–Irish region; later it would profoundly scour Ireland, reshape drainage and destroy or bury many earlier deposits. The survival of Derryvree between two tills is therefore remarkable.

Lower sea levels altered coastlines and exposed continental shelves, but the practical routes by which animals or any people reached Ireland at this time remain uncertain. The evidence does not permit a simple claim of a permanent land bridge, regular migration corridor or established trade network. There is

no proof of exchange in objects or raw materials. Movement, if it occurred, was ecological and opportunistic: animals and perhaps small human groups negotiating a cold, changing Atlantic-edge landscape.

Around 31,080 BCE, Ireland's history is thus written in silt, pollen, seeds, bone and ice-borne debris rather than in chronicles. Derryvree provides the strongest local picture: a cold open wetland that existed between glacial episodes. Castlepook provides the sharper human question: a reindeer bone whose mark may signal butchery, but not yet settlement. Together they show an Ireland capable of supporting life in brief and shifting windows, while reminding us how much of that deep past remains beyond recovery.

Chapter 022 of 100

31079 BCE

Derryvree's Interrupted Waters^[22]



31,079 BCE is not a year that can be recovered as a historical moment in Ireland. No written calendar, settlement sequence or datable human action allows archaeologists to identify events within these particular twelve months. The label is a modern conversion, approximately 33,000 calendar years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). At such depth, dates are expressed as ranges and probabilities, not anniversaries. Ireland can be illuminated by glacial sediments, fossil plants, animal bones and cave deposits, but these record environmental intervals and episodes of deposition rather than a chronicle of a named year.

A Date Within a Long Cold Stage

The closest useful Irish evidence is the Derryvree deposit near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed freshwater silts, fine sands and organic material sealed between two layers of till: the unsorted debris laid down by glacier ice. The order is decisive evidence. Ice had crossed the district before the freshwater sediments accumulated; a later ice advance then covered and preserved them. Derryvree therefore proves substantial environmental change through the last glacial cycle, rather than a permanently frozen Ireland.

Organic material from the deposit yielded the conventional radiocarbon determination BIRM-166, about 30,500 radiocarbon years BP, with a large uncertainty. A radiocarbon measurement is not a calendar date. Atmospheric carbon-14 has varied through time, and measurements must be calibrated using internationally maintained curves. With the original laboratory uncertainty and the uneven shape of calibration curves at this age, the relevant calendar range is broad: Derryvree is generally placed within a late MIS 3 interval of roughly 36,900–31,700 calibrated years BP. The requested date lies within that wide horizon, but it cannot be attached to a particular pool, plant, animal or season at the site.

That distinction matters. The Derryvree sediments are powerful evidence for a local ice-free freshwater environment between glacial advances. They are not proof that all Ireland was ice-free at once, nor do they show what happened everywhere on the island. Much of the older Pleistocene ground surface has been eroded, buried or rearranged by later ice. The rarity of surviving evidence is itself part of the story: Ireland's deep past has been repeatedly edited by glaciers.

Wet Ground and Open Country

The plants, pollen and invertebrate evidence from Derryvree point to a cold, open and largely treeless landscape. Mosses, sedges, grasses and hardy Arctic-alpine plants grew around shallow water and saturated ground. Bogbean, water-milfoil and other wetland taxa indicate that freshwater was present, while dwarf shrubs and herbs speak to exposed land nearby. This was not the familiar Ireland of oak woods, hedged fields and pasture. It was a periglacial mosaic of marshy hollows, open pools, sedge beds, frost-affected soil and sparse vegetation, shaped by a short growing season and severe winters.

Such a reconstruction should not be made too neat. A plant assemblage does not provide a weather diary, and one Fermanagh basin cannot stand for every coast, valley and upland. Nevertheless, it demonstrates a functioning ecosystem rather than an unbroken sheet of ice. Water could pond behind local barriers; plants could establish in sheltered or wet places; insects and small animals could occupy suitable niches. The term often used for comparable waterlogged terrain is muskeg, but the important point is variability: cold, wet ground and open vegetation coexisted with rapidly changing ice margins.

Climate across the North Atlantic was unstable during MIS 3. Greenland ice-core records show abrupt alternations between relatively milder interstadials and markedly colder stadials. Ireland lay on the Atlantic edge of this volatile system. Conditions at Derryvree were cold enough to support tundra-like vegetation, yet sufficiently non-glacial, at least locally and temporarily, for freshwater sediment and organic matter to accumulate. The evidence supports environmental fluctuation, not a simple progression from warmth to cold.

Before the Greatest Ice Expansion

At about 33,000 calendar years BP, Ireland was approaching the fuller development of the last British–Irish Ice Sheet, not living at its later maximum extent. The best large-scale reconstructions place the major last-glacial advance and maximum ice-sheet area later, with maximum extent around 26,000 years BP and maximum volume around 23,000 years BP. Different sectors advanced and retreated at different times, so these figures should not be turned into a single island-wide date. Yet they make one broader point secure: the Ireland of this article belonged to an unstable pre-maximum world, in which ice, periglacial terrain and ice-free refuges were changing their relative reach.

The eventual expansion was transformative. Glaciers stripped soil, deepened valleys, redistributed rock and sediment, and formed or reshaped many of the drumlins, moraines and meltwater channels that remain prominent in the Irish landscape. At Derryvree, the upper till physically sealed the older wetland. What is now evidence for environmental life survived precisely because subsequent ice buried it. Across other areas, however, erosion may have erased the places where animals fed, predators denned or people might briefly have camped.

Castlepook's Faunal Archive

County Cork offers a different kind of evidence. Castlepook Cave, also called Mammoth Cave, lies in the Awbeg valley near Doneraile. Its early twentieth-century excavations recovered more than 2,000 bones and made it Ireland's richest known archive of vertebrate life leading up to the Last Glacial Maximum. Direct dates show that the assemblage accumulated across a very long interval, broadly from about 45,700 to 19,950 years BP. It must therefore not be treated as a single simultaneous animal community, or as a snapshot of 31,079 BCE.

Even so, the list of animals is striking. Castlepook has produced remains attributed to woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Together, they establish that parts of Ireland at different times within the middle and later Ice Age could support large herbivores, predators and cold-adapted smaller mammals. Reindeer and lemmings fit an open, northern environment; mammoth and giant deer point to productive grazing landscapes at least episodically. Spotted hyaena is especially significant, because the cave probably served in part as a carnivore den or a place to which scavengers carried bone.

That last qualification is essential for interpreting everyday life in the Ice Age. A cave bone does not necessarily mark the place where an animal died. Carcasses or portions of carcasses could have been transported by predators, water or people; older excavations also lacked the stratigraphic methods expected today. The Castlepook remains show which species reached Ireland and occupied its landscapes over long periods. They do not demonstrate a stable, fully known food web in a single generation, still less a settled community beside the cave.

The Reindeer Femur Question

One Castlepook object has brought the human question into sharp focus: a reindeer femur bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made by a stone tool during butchery. Public heritage accounts place the bone broadly at about 31,000 BC, close enough to this article's notional date to be highly relevant. If the mark is confirmed as anthropogenic, it would be evidence that someone processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the long-established post-glacial record of human presence.

The evidence should neither be dismissed nor enlarged beyond what it can bear. The dated bone identifies when the animal lived, not the exact instant of cutting. The cave contains material accumulated over many millennia and subject to carnivore activity, water movement and old excavation. No securely associated stone-tool assemblage, hearth, shelter floor, human remains, burial, ornament or repeated concentration of food waste has been recovered for this episode. A cut-marked femur could reflect a brief visit or carcass-processing event; it cannot demonstrate a permanent population, a village or a regular Irish hunting territory.

If people did reach the island, their most plausible livelihood would have involved mobility and close attention to animal movements, weather and usable routes through a cold North Atlantic landscape. A reindeer carcass could yield meat, marrow, hide, sinew, bone and antler. But those are general possibilities, not details proven for Castlepook. There is no Irish evidence at this date for the group's numbers, language, clothing, social organisation or place of origin. Nor can the evidence show whether people killed the animal, scavenged it, or processed it elsewhere before a carnivore carried part of it into the cave.

No Politics, No Proven Settlement

For this date there is no responsible basis for discussing Irish rulers, territories, diplomacy, organised warfare, formal religion, monuments, farming, trade or learning as though they were known institutions. There were no states or written records, and no securely demonstrated resident human community from which such institutions could be inferred. Even the possibility of human presence rests on one important but limited artefact claim. The primary historical subject is therefore landscape and evidence: freshwater between ice advances, mobile animal populations, carnivore activity and the possibility of a fleeting human encounter with that world.

Culture and knowledge are equally beyond direct recovery in Ireland. Upper Palaeolithic communities elsewhere in Europe used sophisticated stone technologies, fire, tailored clothing and wide social connections. Those comparisons establish what contemporary humans were capable of, but they cannot be imported as Irish facts. Ireland has not yielded securely dated art, personal ornaments, lithic workshops or domestic structures for around 33,000 years ago. The absence may reflect real rarity, later glacial destruction, the limited search for surviving deposits, or all three.

An Island at the Edge of Evidence

The most vivid responsibly supported picture is thus not of a prehistoric nation but of a shifting ecological frontier. Around the modern date-label 31,079 BCE, parts of Ireland experienced cold, open landscapes with wetlands and freshwater pools; animals including reindeer and formidable predators moved through suitable terrain over the broader period; and ice was an active force whose later expansion would bury and destroy much of the record. Derryvree and Castlepook are complementary archives: one preserves a wetland between tills, the other a long and complicated accumulation of animal remains.

For Ireland at this depth of time, restraint is not a lack of history. It is the method that allows a compelling history to emerge. The sediments demonstrate a cold but living landscape. The faunal record demonstrates repeated animal occupation. The marked reindeer femur raises, but does not settle, the prospect of an early human visit. Everything more precise than that—including a year-specific event in 31,079 BCE—would be invention rather than archaeology.

Chapter 023 of 100

31078 BCE

Castlepook's Pre-Maximum Fauna^[23]



“31,078 BCE” is a modern label, not a date that anybody in Ireland could have known or recorded. There was no Irish calendar, writing, named ruler or annual chronicle at this depth of time. Nor can archaeology distinguish this particular modern year from the centuries on either side. In conventional archaeological terms, the label lies roughly 33,000 years before AD 1950, within the later part of the Pleistocene and before the fullest expansion of the Last Glacial Maximum. The responsible chronology is therefore expressed in broad, calibrated ranges and environmental phases, rather than as an event on a specific day or in a specific year.

A Cold Stage Before the Maximum

Ireland was then part of the wider north-west European world of Marine Isotope Stage 3, a long and climatically volatile portion of the last glacial cycle. The term “Midlandian” is often used for Ireland’s last cold stage. It should not conjure a simple image of an island permanently smothered in ice. Ice margins advanced and retreated over very long timescales; landscapes that were ice-covered in one phase could be open, frozen, waterlogged or sparsely vegetated in another. Around the notional date used here, the great late-glacial ice-sheet maximum still lay ahead. Reviews of the British–Irish Ice Sheet place its principal build-up after about 35,000–32,000 years ago and its maximum extent broadly between about 27,000 and 21,000 years ago.

This was nevertheless a severe environment. Temperatures, precipitation, sea level and the extent of seasonal frost changed repeatedly. Ireland’s present coastline did not exist: lower global sea levels exposed large areas of the continental shelf, while the Irish Sea basin and connections towards Britain altered as ice and water levels changed. Whether a particular route was dry, marshy, coastal, ice-blocked or navigable depended on the phase and locality. The evidence does not permit a map of travel routes for

31,078 BCE, but it does show that Ireland was not biologically sealed off from neighbouring lands throughout the period. Mammals reached the island during pre-maximum intervals, almost certainly through changing land and coastal connections.

Derryvree's Buried Waters

The clearest environmental evidence close to this broad period comes from Derryvree near Maguiresbridge, County Fermanagh. There, organic-rich freshwater sediments were preserved between two beds of glacial till. The sequence matters because the lower till records an earlier ice advance; the organic layers record a subsequent interval in which open water, wet ground and living plants existed at the site; and the upper till records later overriding or renewed glacial conditions. A radiocarbon determination from the organic material was reported as 30,500 radiocarbon years BP, with an uncertainty of roughly a millennium. Such a result is not equivalent to a single calendar year: calibration and the statistical range place it within a substantially broader span of calendar time.

The Derryvree deposits contain freshwater mosses and sedges, together with plant remains and insects of cold northern character. These are direct traces of organisms that lived in or beside a wetland. They support a reconstruction of a treeless, open, cold landscape with freshwater pools, sedgy margins and patches of mossy ground, sometimes described as muskeg or tundra wetland. That reconstruction is an interpretation, not a photograph of all Ireland. A buried Fermanagh basin cannot prove that every county was ice-free, equally wet or identical in vegetation. It does, however, decisively complicate the idea of a uniformly frozen island and shows that habitable ecological niches existed between major glacial episodes.

Plant evidence also establishes what was absent as well as what was present. There is no basis for imagining the wooded Ireland of later millennia, fields, hedges or agricultural clearances. Trees were extremely restricted or absent locally; low-growing herbs, grasses, sedges, dwarf shrubs, mosses and aquatic plants were better suited to the conditions. The productive parts of such country would have been unevenly distributed: sheltered slopes, river corridors, spring-fed ground and shallow lakes could offer food and cover where exposed ridges and wind-scoured ground did not. Seasonality would have been decisive, although no Irish deposit can reconstruct the weather of a particular winter or summer at this date.

Castlepook and the Animal World

At the opposite end of the island, Castlepook Cave—also called Mammoth Cave—near Doneraile in north County Cork provides the most important Irish faunal archive for the period leading towards the Last Glacial Maximum. Excavations undertaken in the early twentieth century recovered a large collection later transferred to the National Museum of Ireland. Its contents include remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, fox, mountain hare, lemmings and spotted hyaena. Individual bones and deposits have different histories and dates; the assemblage is not a single moment frozen in time. Yet taken together, it demonstrates that Ireland supported, or was repeatedly visited by, a notably diverse cold-stage mammal community between approximately 45,000 and 30,000 years ago.

That community was not a peaceful pastoral scene. Reindeer and other herbivores were potential prey for carnivores as well as scavengers. Spotted hyaenas, now absent from both Ireland and Europe, are especially significant. Their remains indicate that the cave system formed part of a predator-and-scavenger landscape, in which bones could be accumulated, moved, gnawed, broken and mixed by

animals, water, frost and cave collapse. This is why cave bone requires careful taphonomic study. A damaged surface may result from carnivore activity, trampling, weathering, excavation or museum handling; it cannot automatically be treated as evidence of people.

One reindeer femur from the old Castlepook collection has made the human question unusually prominent. It has been publicly presented by zooarchaeologist Ruth Carden as bearing a deep mark consistent with cutting or chopping by a sharp stone edge while the bone was fresh, and it has been associated with an age of about 33,000 years. If the mark is confirmed as anthropogenic, it would indicate that people handled a reindeer carcass in Ireland during the Upper Palaeolithic, far earlier than the island's once accepted post-glacial archaeological beginning. It would be a major discovery. It would not, however, establish a permanent population, a village, an ethnic group, a named migration or an event precisely in 31,078 BCE.

The limits are crucial. The femur derives from an antiquarian cave collection rather than a modernly excavated occupation floor with an unbroken stratigraphic record. No securely associated stone-tool assemblage, hearth, shelter, human burial, ornament or repeated butchery surface has yet been published for this proposed early episode. A radiocarbon result dates the animal's death, while identifying a cut mark is a separate judgement about how the surface was modified. Recent excavation at Castlepook has sought surviving undisturbed deposits and has confirmed the continuing research value of the cave, but it cannot retrospectively supply all the contextual information lost during older investigations.

People: Possibility, Not Population

Accordingly, a cautious account of society must begin with absence. There is no evidence for Irish political institutions, chiefs, borders, diplomacy, organised warfare, ritual sites, language, art or formal learning at this date. There is no demonstrable settlement pattern, economy of exchange, or enduring community from which social ranks or family organisation can responsibly be inferred. To describe "Irish tribes" confronting one another would be invention. The word Ireland is used only for the geographical area occupied by the modern island, not for a political or cultural entity that then existed.

If people did reach Castlepook or other Irish localities in this phase, the most defensible interpretation is brief activity by highly mobile Upper Palaeolithic hunter-gatherers. Comparable groups elsewhere in north-west Europe knew fire, sophisticated stone technologies, animal skins, seasonal movement and wide social connections. But those wider comparisons describe possibilities, not demonstrated Irish practice. Even the marked femur would not tell us whether a reindeer was hunted, scavenged after a carnivore kill, or processed somewhere else before the bone entered the cave. Meat, fat, hide, sinew, bone and antler could all have been useful, but no securely contextualised Irish evidence shows how such resources were shared, transported or worked.

Landscape as Historical Force

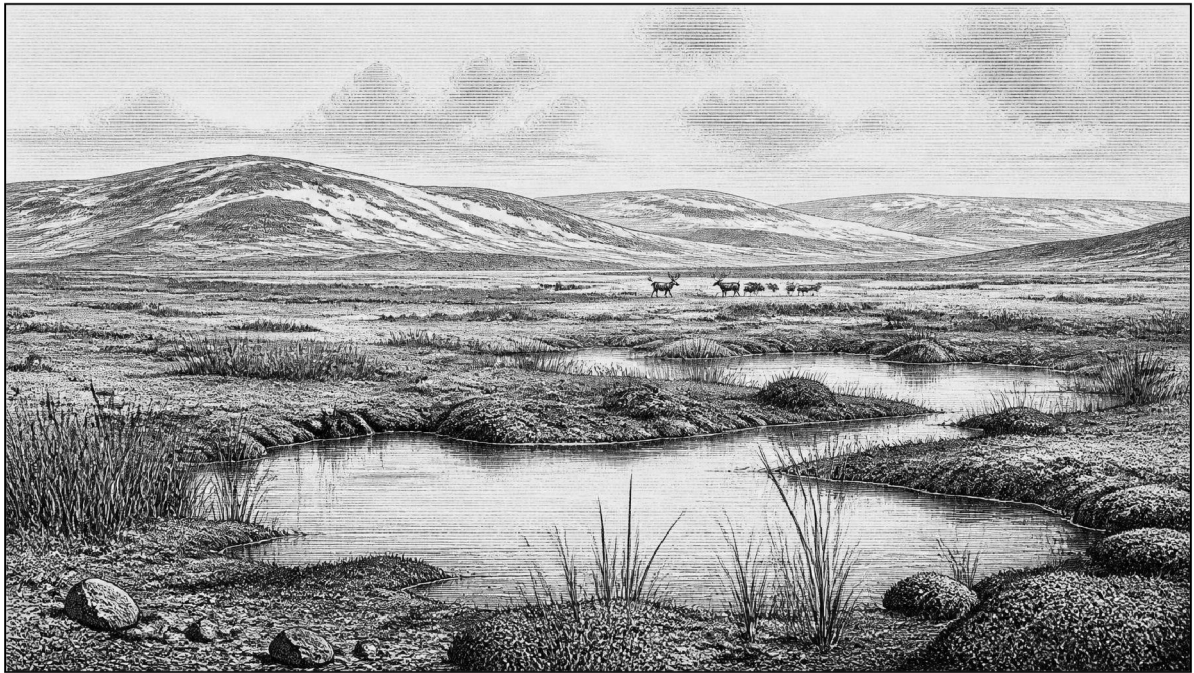
The strongest historical development around this notional year was therefore environmental rather than political. The approach of the Last Glacial Maximum was reshaping the opportunities available to every living thing. Wetlands such as Derryvree reveal local freshwater life during an ice-free interval; Castlepook records a broader animal world capable of reaching and exploiting the island; subsequent ice advances would erode, bury and fragment much of the evidence. This destruction helps explain why the record of any possible human visits is so thin. The absence of camps is meaningful, but it is not identical to proof that no person ever stood in Ireland before the maximum.

For 31,078 BCE, then, the appropriate history is one of calibrated uncertainty. Ireland was a cold, unstable and regionally varied land on the threshold of more extensive glaciation. Its surviving archives preserve sedges, mosses, insects, freshwater muds and animal bones rather than rulers or battles. They show an ecological frontier occupied by cold-adapted plants and mammals, with a tantalising but unconfirmed indication that people may have entered it. That distinction between what the deposits demonstrate and what they merely allow us to imagine is the essential discipline of Ireland's deepest past.

Chapter 024 of 100

31077 BCE

BIRM-166 Under Ice^[24]



31,077 BCE is a modern calendar label, not a recoverable Irish year. No person in Ireland then used such a date; there are no texts, named communities or annual records. Archaeology cannot identify a political event, a birth, a battle or even a particular season for this point in deep time. In calendar terms it falls roughly 33,000 years before the conventional radiocarbon reference year of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically unsettled phase of the last Ice Age.

The responsible history of Ireland at this date must therefore be told through deposits, fossils, stratigraphy and calibrated ranges. These sources illuminate environments and possibilities, not a diary of a single year. The most valuable Irish evidence close to this notional date is a buried wetland deposit at Derryvree, near Maguiresbridge in County Fermanagh, together with the older animal collections from Castlepook Cave near Doneraile, County Cork. Each is important; neither supplies the foundation for a conventional year-by-year narrative.

A Date Within a Range

Derryvree was exposed during roadworks in 1969, when a cut through a drumlin revealed a sequence of fine sands, freshwater silts and organic layers between two thick bodies of till. Till is the unsorted sediment deposited by glacier ice. The basic order of the sequence is clear: ice had occupied the locality; an interval followed in which water, vegetation and organic matter accumulated; then a later glacial advance buried the record beneath fresh till. That makes Derryvree an unusually eloquent witness to a changing Pleistocene landscape.

Organic material from the freshwater layers produced the radiocarbon determination BIRM-166: 30,500 radiocarbon years before present, with a substantial uncertainty of +1,170 and -1,030 years. Radiocarbon ages are not identical to calendar ages, especially at this depth in time. Using modern calibration, the determination has been discussed as broadly about 36,900–31,700 calibrated years before present, or approximately 34,950–29,750 BCE. The requested year lies within that broad span, but it cannot be placed in one particular layer or treated as the date on which a pool, plant or animal existed.

Indeed, the range is the point. BIRM-166 dates material within an accumulating deposit, while calibration itself is a statistical conversion based on changing atmospheric radiocarbon. The current IntCal20 curve extends to 55,000 calibrated years before present, but it does not turn a Late Pleistocene sample into annual history. Derryvree may responsibly illuminate Ireland *around* 31,077 BCE; it cannot certify the conditions of the whole island in that numbered year.

Freshwater Between Glaciers

The Derryvree evidence indicates that this part of Fermanagh was locally free of glacier ice during the period represented by the organic beds. It does not prove that every coast, upland or valley in Ireland was ice-free simultaneously. Ireland's climate and ice cover were regionally variable, and the subsequent expansion of the Irish Ice Sheet destroyed, disturbed or sealed much of the older evidence. The surviving record is therefore both precious and geographically limited.

What did survive at Derryvree was the signature of cold, open ground with standing or sluggish freshwater. The deposit contained freshwater mosses and sedges, together with insects of northern, cold-climate aspect. These remains support an image of wet, treeless terrain: pools and saturated margins, low vegetation, seasonally productive patches and severe winters. This was not the wooded island familiar from later prehistory or the modern period. It was a periglacial landscape, strongly shaped by frost and cold, though not permanently entombed beneath ice at that locality.

Such country need not have been biologically empty. Sedge beds, mosses, shallow water and short-lived summer growth could sustain small but real food webs. Yet Derryvree should not be enlarged into an imagined national park. Its sediments record a particular basin near Maguiresbridge. Sheltered hollows, limestone country, exposed uplands and coastal margins may all have offered different conditions. The evidence demonstrates local freshwater and cold-adapted vegetation; wider reconstructions are informed interpretation, not direct observation.

Cork's Cave Fauna

Castlepook Cave, also known as Mammoth Cave, in north County Cork provides the principal animal archive relevant to this broad interval. Antiquarian excavations there recovered a remarkable but difficult collection from cave passages: bones of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare and spotted hyaena are among the animals identified from Castlepook and related southern Irish cave records. Their presence shows that, during parts of MIS 3, Ireland supported or was visited by a varied cold-stage fauna.

Cave collections require careful handling. Bones can enter caves after natural death, carnivore activity, flooding or sediment movement. Castlepook was extensively excavated in the early twentieth century, before modern standards of recording, and its faunal material derives from more than one episode. Direct re-dating has shown that some older Irish cave radiocarbon determinations were

significantly too young, while the revised results place part of the Castlepook fauna much earlier, within MIS 3. A mammoth or reindeer bone is thus strong evidence that such animals occurred in Ireland during a broad interval; it is not proof that they all grazed together in one valley in 31,077 BCE.

The animal record nevertheless has important environmental implications. Reindeer are well suited to open, cold landscapes; mammoth and hyaena, in their different ways, belong to ecological settings very unlike later forested Ireland. Their occurrence supports the conclusion from Derryvree that substantial areas could have been open rather than densely wooded. Predators and scavengers also remind us that caves were not neutral containers: they were places used by animals, altered by water and later investigated by people separated from the original deposits by tens of millennia.

The Human Question

A reindeer femur from Castlepook has attracted particular attention because it bears a deep mark interpreted as consistent with cutting or chopping by a stone tool during butchery. County Cork heritage publications describe it as Palaeolithic material of about 31,000 BC, and the find has been presented as potentially extending evidence of human activity in Ireland far beyond the long-accepted post-glacial record.

This claim is important but remains limited. If the mark was made by people, it indicates a human action upon an animal: perhaps the processing of meat, hide, marrow or another useful resource. It does not demonstrate a resident population, a settlement, a hearth, a tool-making site, a burial, a repeated hunting ground or a route of arrival. No securely associated lithic assemblage or intact occupation surface establishes an Upper Palaeolithic camp at Castlepook. The bone's cave context and the history of early excavation make the strongest claims difficult to test.

The fairest conclusion is neither dismissal nor certainty. Ireland may have been visited by people during MIS 3, and the marked femur is a serious reason to investigate that possibility further. But at 31,077 BCE there is no secure basis for describing Irish families, languages, ethnic groups, religious rites or seasonal migration patterns. The first firmly documented human presence in Ireland still belongs much later, after the great ice had retreated, although research at Castlepook may yet refine the deeper story.

No Politics, But Profound Change

Political affairs, diplomacy and warfare leave no identifiable trace for Ireland at this date. There were no known states, chiefs, monuments, treaty sites or named territories. Even if small human groups crossed or reached the island, the evidence cannot tell us how they organised authority, settled disputes or related to communities elsewhere. It would be misleading to fill this silence with models borrowed from better-known Upper Palaeolithic societies in continental Europe.

The great historical development was environmental rather than political: the approach of major glaciation. Derryvree's upper till records the return or expansion of ice after the freshwater interval. More broadly, evidence from Ireland and its surrounding seas indicates that the last Irish Ice Sheet expanded after these MIS 3 ice-free intervals, reaching much greater extent during the Last Glacial Maximum, broadly between about 26,500 and 19,000 years ago. At 31,077 BCE this maximum still lay ahead, but the conditions that would transform Ireland's terrain, drainage and habitats were gathering force.

Lower global sea levels altered coastlines and the geography of the surrounding shelf, but they do not by themselves establish a dry, usable land bridge or a known route into Ireland at this time. Any human visitor would have faced a changing Atlantic-edge world in which water crossings, exposed shelf lands,

ice margins and animal movements varied over long timescales. The archaeological evidence is insufficient to reconstruct a journey with confidence.

What Can Be Said

Everyday life, economy, trade, religion and learning cannot be directly recovered for Ireland in this year. There is no evidence for farming, metalworking, exchange networks, shrines, art or formal institutions. If people were present, their likely subsistence would have depended on immediate knowledge of animals, weather, fuel, shelter and stone, but that is an inference from hunter-gatherer life elsewhere, not a demonstrated Irish fact.

What can be said with confidence is more modest and more remarkable. Around this point in the Late Pleistocene, a freshwater wetland existed during an ice-free interval at Derryvree in Fermanagh. Cold-adapted plants and insects inhabited its margins. Across the island, or at least during overlapping phases of MIS 3, cave deposits preserve evidence of large mammals and carnivores in landscapes later radically altered by ice. One marked reindeer bone from Cork raises, but does not settle, the question of an earlier human visit. BIRM-166 is therefore not a record of a lost Irish year. It is a surviving fragment of a much longer environmental story, sealed between glaciers and still capable of changing what Ireland's earliest past may mean.

Chapter 025 of 100

31076 BCE

Derryvree Roadcut Archive ^[25]



A Year That Cannot Be Dated

“31,076 BCE” is a modern label for a point far beyond the reach of annals, rulers, named peoples or calendar-year events. It must not be treated as a date on which something known to have happened in Ireland. In the archaeological convention of years before AD 1950, it falls roughly 33,025 years before present; but that conversion is only a mathematical orientation, not a precise historical date. At this depth of time, radiocarbon results require calibration and commonly carry uncertainties of centuries or millennia. The responsible evidence consists instead of broad calibrated ranges, sediments deposited during cold phases, animal remains and the difficult interpretation of altered bones.

Ireland lay in the later part of Marine Isotope Stage 3, within the Midlandian cold stage of Irish Quaternary terminology. The fullest expansion of the last British–Irish Ice Sheet still lay ahead in many sectors. Recent reconstructions begin at 31,000 years ago because ice growth was already under way around the wider archipelago, but they also stress regional variation and uncertainty in ice margins. Ireland was neither a stable modern island nor a single uniform wilderness: advancing and retreating ice, changing sea levels, exposed shelves and local ice-free ground repeatedly altered the map.

Derryvree Between the Tills

The clearest Irish environmental archive relevant to this notional year was exposed in 1969 when roadworks cut through a drumlin at Derryvree, near Maguiresbridge in County Fermanagh. The roadcut revealed organic silts and fine sands trapped between two thick tills: deposits left by ice on separate

advances. The sequence is valuable because the intervening freshwater sediments accumulated during a period when the site was not overridden by glacier ice, then were sealed beneath later glacial debris. It is evidence for an interval, not for one season, one generation or one event.

Organic material from Derryvree produced a conventional radiocarbon determination of 30,500 years BP, with an uncertainty of +1,170 and -1,030 years. Later discussion gives a broad calibrated range of about 31.7–36.9 thousand calendar years BP. That range overlaps the era conventionally represented by 31,076 BCE, but it is far too broad to identify the numbered year itself. The deposit has therefore become an important marker for a Middle Midlandian cold, non-glacial episode, rather than a timestamp. Its value lies in the combination of stratigraphy, plant remains, insects and sediments.

The Derryvree evidence indicates an open, treeless tundra or muskeg landscape, with wet ground, mosses and pools amid cold-climate vegetation. Pollen, seeds and other plant remains point to grasses, sedges, herbs and juniper, while the recovery of bogbean is especially evocative of freshwater or marshy habitats. This was not a blank white expanse. Even a severe periglacial climate could support local wetland plant communities, insects and grazing animals wherever water, summer thaw and exposed ground permitted. Yet it was not woodland country, and the long, severe winters inferred from the assemblage would have imposed sharp limits on biological productivity.

Cold Country, Not Continuous Ice

Derryvree also corrects a simple picture in which all of Ireland was continuously buried beneath ice throughout the last cold stage. The two tills show that glaciers did advance across the district; the organic layer proves that ice-free conditions intervened. Exactly how that local sequence correlates with changing ice elsewhere in Ireland remains a matter of reconstruction. Subsequent glacier action removed or disturbed much of the older landscape, which is why deposits protected beneath till are disproportionately important. Their survival is accidental, but their testimony is direct: northern Ireland contained at least some cold, watery, ice-free terrain during part of this broad period.

Evidence from Crag Cave in County Kerry provides a complementary, though not precisely synchronous, climate record. Speleothems form only when liquid water percolates through a cave. Uranium-thorium dating shows that deposition in this southwest Irish cave occurred episodically during Marine Isotope Stage 3 and broadly matched warmer Greenland interstadials. That does not mean Derryvree experienced mild conditions. Rather, it demonstrates that the Irish climate responded to abrupt North Atlantic fluctuations: a landscape could shift between somewhat ameliorated, wet phases and much harsher cold conditions over timescales invisible to a calendar year.

Castlepook's Faunal Landscape

In north County Cork, Castlepook Cave near Doneraile—also known as Mammoth Cave—offers another window onto Ireland before the Last Glacial Maximum. Cave collections made in the early twentieth century contained bones of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Direct radiocarbon programmes have shown that parts of this fauna belong to Marine Isotope Stage 3, well before the later maximum of the ice sheet. Reindeer, mammoth and hyaena together imply open country capable of sustaining large grazers and their predators or scavengers, rather than a closed forest.

These finds should nevertheless be handled cautiously. A cave bone assemblage need not represent animals living together, dying together or entering a cave in the same way. Carnivores may have dragged carcass parts into chambers; water, roof collapse and excavation practices may have mixed material of different ages. The pioneering excavations at Castlepook began long before modern recording, sieving and microscopic taphonomic analysis. The cave is a rich archive of changing Ice Age fauna, but it is not a securely preserved village site or hunting camp.

The most arresting object is a reindeer femur from Castlepook, assigned broadly to about 31,000 BCE in public interpretation and carrying a deep surface mark identified by zooarchaeologist Ruth Carden as consistent with cutting or chopping by a sharp stone tool. If that reading is confirmed, it would indicate human handling of a reindeer in Ireland during the Upper Palaeolithic and radically extend the island's known human story. It does not establish that people lived permanently nearby, that they killed the animal, or that a human group was present in the precise year represented here. No associated hearth, stone-tool assemblage, dwelling, burial or stratified occupation surface has yet been recovered from this episode.

People: A Possibility, Not a Population

The most defensible conclusion is deliberately modest. The marked femur may record a brief human encounter with an animal carcass—perhaps the removal of meat, hide, sinew or marrow—during a phase when Ireland was accessible to large mammals and potentially to highly mobile hunter-gatherers. It cannot reveal the size, language, kinship system, identity or destination of any people involved. Nor can it distinguish a planned hunt from opportunistic scavenging. A radiocarbon date on the bone dates the animal's death within a range; the interpretation of the mark as made by a stone tool is a separate question.

There is consequently no evidence from Ireland around this point for political authorities, diplomacy, warfare, territorial kingdoms, trade networks, formal religion, monuments or writing. It would be misleading to supply them from later prehistory or from better-known Upper Palaeolithic societies in continental Europe. Similarly, there is no secure Irish evidence for art, learning institutions, houses, clothing styles or a named archaeological culture. The absence is partly real and partly archaeological: later ice and erosion removed landscapes, lowered sea levels submerged others, and the surviving cave and sediment records are fragmentary.

Movement Across a Changing Northwest

Lower sea levels altered coasts and continental shelves, but they do not automatically prove a walkable land bridge between Ireland and Britain at this moment. Ice, sea, rivers, topography and seasonality all affected possible routes, and the palaeogeography remains complex. Animal remains demonstrate that mammals reached Ireland in several Pleistocene phases; they do not by themselves show the route or timing of each crossing. The same caution applies to people. If humans did reach Cork, their presence may have been short-lived and seasonal, part of wider movements through north-west Europe rather than the beginning of continuous settlement.

For everyday life, the archaeological evidence is stronger for animals and habitats than for human households. Reindeer and other herbivores would have followed the scattered resources of open vegetation; hyaenas and wolves participated in the same food web; freshwater pools and mossy wetlands

sustained specialised plants and insects. Human groups, if present, would have needed to operate within this severe seasonal world. That is an ecological inference, not direct testimony. The material record does not yet permit a reconstruction of camps, family life or social custom in Ireland.

The Historical Significance of Silence

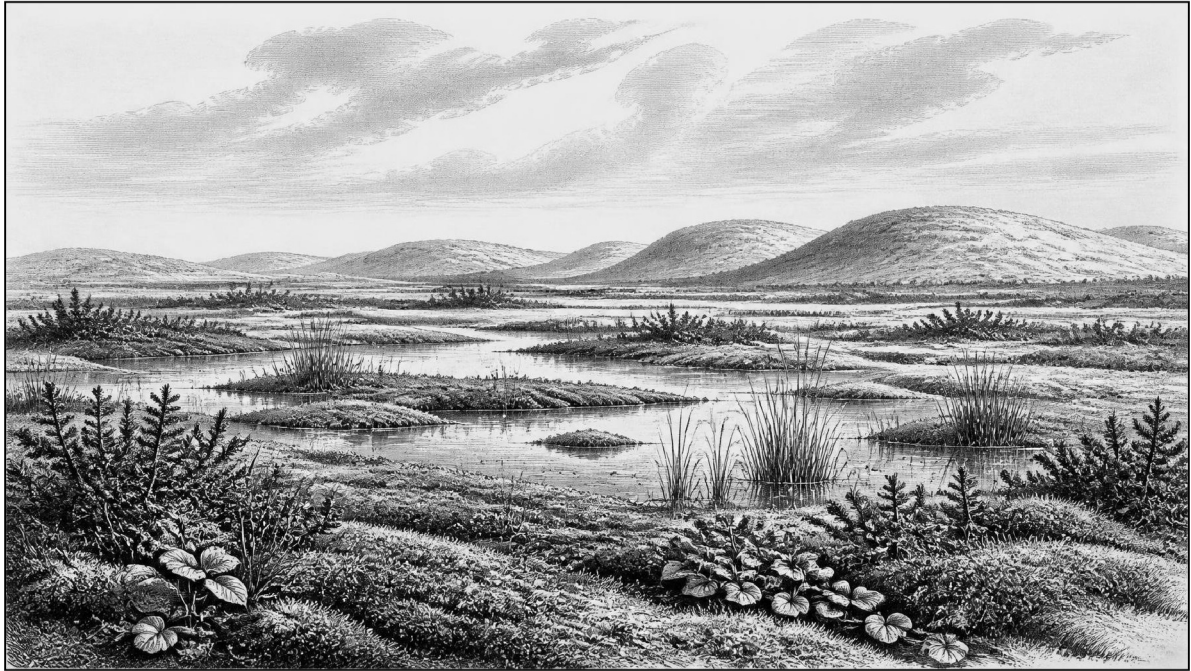
The importance of this period is not a dramatic dated event but the survival of a few difficult records. Derryvree preserves a frozen-in-place environmental interval beneath a drumlin. Castlepook preserves animals from an older Irish fauna and a possible trace of human carcass processing. Crag Cave records the pulse of liquid water through a changing glacial climate. Together they show that Ireland around the broad era represented by 31,076 BCE was environmentally dynamic, locally habitable for cold-adapted life and potentially visited by people, while remaining far from the continuously settled Ireland of later millennia.

That distinction matters. The evidence supports a landscape of tundra wetlands, open grazing country, caves used or altered by animals, and approaching large-scale glaciation. It supports neither a named first settler nor a year-specific Irish episode. The most accurate history for this date is therefore a history of calibrated ranges, buried silts, bones and uncertainty—an acknowledgement that Ireland's deep past is real and recoverable, but not yet reducible to a conventional calendar narrative.

Chapter 026 of 100

31075 BCE

Derryvree's Trifoliate Pool ^[26]



31,075 BCE is not a year that can be recovered from the Irish archaeological record. It is a modern calendar label for a point roughly 33,000 calibrated years before AD 1950, deep within the Late Pleistocene. No community in Ireland counted years in this fashion; no written record, settlement horizon or dated event permits a history of one particular year. The responsible approach is to place the date within broad scientific ranges. It falls within the wide calibrated span associated with the Derryvree freshwater deposits near Maguiresbridge, County Fermanagh: an exceptionally rare Irish archive of an ice-age environment, rather than evidence for an event in a precisely known calendar year.

A Date Within a Long Cold Phase

The period belongs to Marine Isotope Stage 3, a fluctuating interval of the last glacial cycle before the full development of the Last Glacial Maximum. Older Irish terminology calls part of this interval the Middle Midlandian or Derryvree Cold Phase. Such labels describe large-scale climatic and stratigraphic patterns, not a single, uniform weather regime extending across the island. Ireland's evidence is sparse because later glaciers scoured, displaced and buried many earlier deposits. What survives is local, fragmentary and often difficult to date. It can nevertheless show that the island was not simply a timeless, featureless sheet of ice throughout the whole Late Pleistocene.

The critical record was uncovered in a road cutting at Derryvree in 1969. There, freshwater silts and fine sands containing organic remains were trapped between two tills: unsorted debris deposited directly by glacier ice. Their order is decisive. Ice had occupied the locality when the lower till formed. It was absent locally for long enough for standing or slow-moving freshwater, sediment, plants and small

animals to accumulate. A later advance then sealed the deposit beneath another till. The sequence records changing conditions in one Fermanagh basin, not proof that every part of Ireland was simultaneously ice-free.

An organic sample from the Derryvree series produced a conventional radiocarbon determination of about $30,500 \pm 1,100$ radiocarbon years BP. Radiocarbon years are not calendar years: past atmospheric carbon levels varied, so results must be calibrated against independently dated records. Published discussion places the deposit broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The nominal date of 31,075 BCE sits within that broad interval, but cannot be assigned to one seed, pool, season or occupation. At this depth in time, even excellent evidence offers ranges rather than annual precision.

A Treeless Fermanagh Wetland

Derryvree's fossil contents suggest cold, open country rather than forest. Pollen and plant macrofossils indicate grasses, sedges, juniper and herbs, accompanied by an abundant moss flora. The setting has been described as treeless muskeg: wet, peaty or organic ground with shallow water, sedge-rich margins and patches of low vegetation. It was not necessarily a permanent, continuous bog in the modern Irish sense. Sediments accumulated episodically, and water levels, freezing conditions and vegetation cover changed over time. Yet this was a living landscape, with freshwater habitats embedded in an exposed, periglacial terrain.

Several of Derryvree's plants make the reconstruction unusually tangible. Bogbean, *Menyanthes trifoliata*, is represented by a seed; water-milfoil points to aquatic habitat; mountain-avens and lesser clubmoss are plants strongly associated with cold, open environments. Mosses and sedges further support the picture of wet ground at the edge of a harsh landscape. These fossils do not provide a scenic photograph of Ireland in 31,075 BCE. They establish a carefully bounded conclusion: during part of the deposit's long date range, this locality sustained freshwater and wetland vegetation despite cold climatic conditions.

That distinction matters because climate was unstable. The large British–Irish Ice Sheet reconstructions presently begin at 31,000 years BP, slightly later than the calendar point represented here, and show substantial ice in northern Irish uplands by then, with further growth thereafter. They are powerful models, but should not be projected backwards as exact maps for 31,075 BCE. Derryvree's buried wetland and later ice-sheet reconstructions together imply regional change through time: local ice-free ground and cold-water ecosystems existed during an earlier interval, while renewed and more extensive glaciation subsequently transformed much of the landscape.

Animals, Caves and Caution

County Cork provides the principal faunal counterpart to Fermanagh's environmental record. Castlepook Cave, near Doneraile, is Ireland's richest known repository of vertebrate remains from the period leading towards the Last Glacial Maximum. Its Pleistocene assemblage includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; other remains from the cave record animals adapted to colder conditions, including lemmings, Arctic fox and wolf. These finds demonstrate that Ireland, at different times before and after the glacial maximum, could support a far wider mammal community than the island later possessed.

They should not, however, be assembled into an imaginary herd passing Castlepook in one particular year. Cave deposits are accumulations. Bones may have been carried in by hyaenas, moved by water, disturbed by earlier excavations or derived from different episodes separated by millennia. Improved radiocarbon dating has shown that several southern Irish cave animals are older than had once been supposed, placing important parts of the fauna in MIS 3. The evidence supports a broad reconstruction of open feeding landscapes, prey animals and large carnivores. It does not demonstrate that every listed species coexisted at Derryvree, or even at Castlepook, in 31,075 BCE.

A reindeer femur from Castlepook has particular importance because a mark upon it has been interpreted as having been made by a sharp stone tool on fresh bone. If that interpretation withstands continuing study, it may represent the earliest known indication that people handled animal carcasses in Ireland, around this broad pre-maximum period. The claim is significant but limited. A cut-marked bone is not a camp. No securely associated stone-tool assemblage, hearth, dwelling floor, burial, repeated occupation surface or food store of comparable age has been found at Castlepook. The cave was also used by carnivores, making the route by which bones entered it especially complex.

People: Possible Presence, No Known Community

Across north-western Europe, Upper Palaeolithic groups hunted, gathered, travelled and adapted their technology to severe climates. That wider context makes a human presence in Ireland conceivable. It cannot turn possibility into proof. At this date there is no securely demonstrated Irish settlement, no house, no lithic workshop and no identifiable population from which to infer language, kinship, leadership or territory. The careful historical statement is that Ireland may have been visited or used intermittently by mobile people, but the material record has not yet established an enduring community.

Accordingly, political affairs, diplomacy and warfare are beyond recovery. There are no named leaders, polities, alliances, borders or negotiated relations. Nor is there evidence for religion in the form of shrines, graves, ritual deposits, art or formal ceremonial places. It would be misleading to supply them from later Irish prehistory, whose monuments and farming communities lay tens of millennia in the future. The same restraint applies to culture and learning: the Derryvree plants and Castlepook bones preserve ecological history, not a recoverable body of beliefs or stories.

Economy and Movement

No human economy can be documented directly for Ireland at this point. If people did reach the island, their subsistence would most plausibly have depended on mobile hunting and gathering, as among contemporary Upper Palaeolithic populations elsewhere; but that is an analogy, not Irish evidence. Reindeer, giant deer and other large mammals would have been potential resources, while wetlands offered water, plants and smaller animals. Nothing yet shows how such resources were organised, shared or transported. There is no evidence for farming, herding, metalworking, pottery, permanent villages or long-distance trade.

Coastlines and sea levels were unlike those of today, but this too requires care. Lower global sea level exposed wider shelf areas around Britain and Ireland during the glacial cycle, while shifting ice and water routes altered possible movements. No securely dated route, boat, crossing place or exchange network belongs to 31,075 BCE in Ireland. It is safer to say that the island's changing geography formed the setting for any movement, animal or human, than to claim a known land bridge or migration corridor.

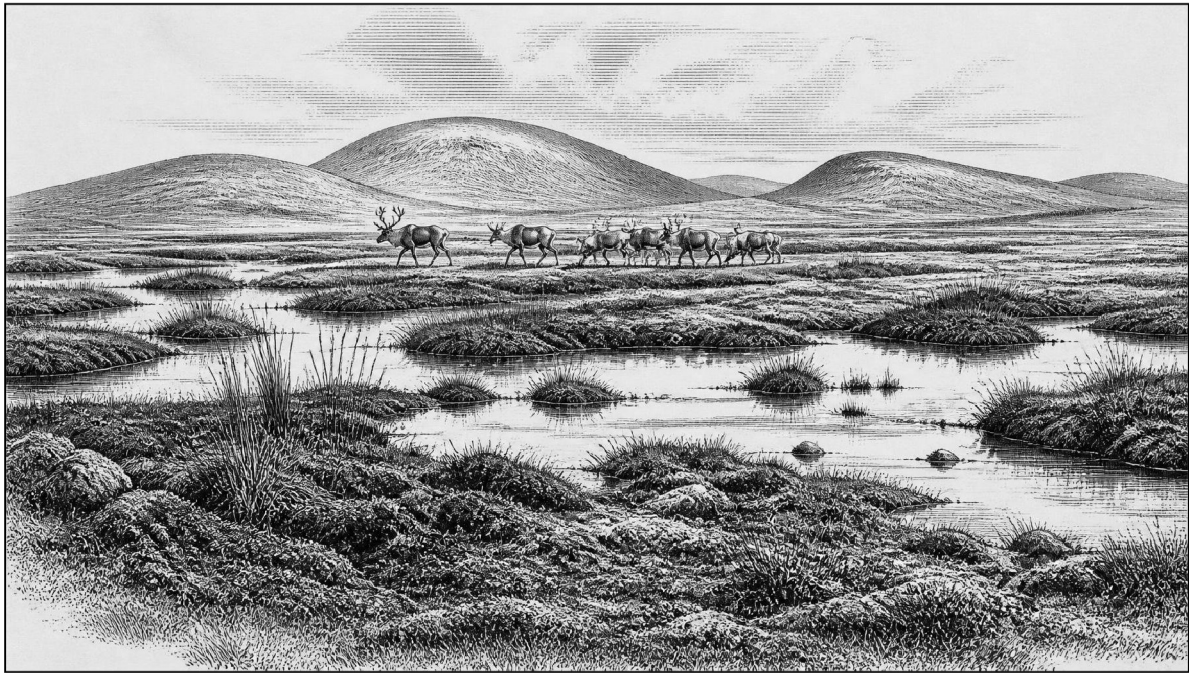
What This Year Can Mean

The most historically meaningful development around this notional year is therefore not an event but a condition: Ireland contained, or had recently contained, habitats capable of sustaining cold-adapted life during an unstable ice-age interval. Beneath a Fermanagh drumlin, Derryvree preserved a small freshwater world of sedges, mosses, aquatic plants and bogbean. In Cork caves, animal remains preserve evidence of broader open-country ecosystems and a provocative, still incomplete question about human activity. Together they replace both extremes—the empty frozen island and the fully known hunter’s landscape—with a more accurate picture: a changing land whose rare surviving archives are rich, but resolutely calendarless.

Chapter 027 of 100

31074 BCE

Maguirebridge's Vanished Fen^[27]



Modern calendar-year precision is not available for Ireland in 31,074 BCE. The label is a convenient point on a modern timescale, roughly 33,000 calendar years before AD 1950, rather than a year that anyone then living could have named, recorded or experienced as a discrete historical unit. Ireland had no writing, states, rulers or dated events. The responsible subject is therefore a broad Late Pleistocene interval: part of Marine Isotope Stage 3, a climatically variable phase of the last Ice Age. Its evidence comes chiefly from stratified sediments, fossil plants and animals, glacial landforms, and one much-debated possible trace of human activity.

A Point Within a Long Interval

The closest especially informative Irish sequence is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed a drumlin cut through by two layers of till, the unsorted sediment laid down by glacier ice. Between them lay freshwater silts, sands and organic deposits. This arrangement is more revealing than it may first appear. It shows that ice had crossed the locality, that an interval followed in which water and vegetation could accumulate sediment, and that renewed glacial activity later buried the record beneath another till.

Organic material from Derryvree produced a conventional radiocarbon determination of about 30,500 $\pm$ 1,200 radiocarbon years before present. Radiocarbon ages are not calendar dates: past atmospheric carbon-14 levels varied, and measurements must be calibrated against internationally maintained curves. Published discussion places the Derryvree material broadly at about 36,900–31,700 calibrated years before present, or approximately 34,950–29,750 BCE. Thus 31,074 BCE falls within the wide chronological horizon illuminated by this deposit, but it cannot be assigned to a particular layer, season, pool or living creature within it.

This distinction is essential. Derryvree is not a photograph of all Ireland in one year. It is a local archive, surviving by unusual good fortune beneath a later glacial deposit. Yet its sequence gives rare evidence that at least part of Fermanagh was ice-free for a time during the later Pleistocene, and that cold-climate wetlands existed between episodes of more extensive glaciation.

Treeless Wetlands and Open Ground

The environmental picture suggested by Derryvree is of a treeless, cold landscape with wet ground, standing or slow-moving freshwater, and low vegetation rather than forest. Irish Quaternary researchers have characterised the setting as a muskeg-like environment: a waterlogged mosaic of mossy, sedgy and shrub-rich ground. Plant and insect evidence from such deposits is valuable because it records conditions close to the place where it was buried. It indicates that summer thaw, moisture and sheltered terrain could sustain local biological communities even in an overall severe climate.

That does not mean a uniformly frozen or uniformly habitable island. Conditions varied sharply with season, altitude, exposure and proximity to ice. A lowland basin could hold shallow water and wetland plants while uplands, or regions nearer an advancing ice margin, were far harsher. In this period Ireland was also not separated from Britain and continental north-west Europe by the modern coastline. Lower global sea levels exposed extensive areas now below the Irish Sea and Atlantic shelves, changing travel corridors, drainage systems and the effective size of the land available to animals and, perhaps, people.

The landscape was nevertheless heading towards greater instability. The British–Irish Ice Sheet was not yet at its later maximum extent, but ice was growing and reorganising across the region. The fullest Late Glacial Maximum expansion occurred thousands of years after the Derryvree interval, broadly around 26,000–23,000 calibrated years before present. Later ice movement destroyed or concealed much earlier evidence. This is one reason why Ireland’s record for this age is so fragmentary: absence of a site may reflect erosion and burial rather than proof that no animals or people ever reached the island.

The Animal World

Irish cave collections provide another, less tightly contextualised window onto this world. Late Pleistocene remains from southern Irish caves include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Not every species need have lived together, or at the same moment, and cave deposits commonly represent accumulations over long spans. Carnivores can drag carcass parts into caves; water, frost, collapse and older excavation methods can disturb their original position. The secure conclusion is that Ireland was connected to, or repeatedly reached by, a richer cold-stage fauna than survives today.

Reindeer are particularly evocative because their presence implies open country able to support grazing herds. Mammoths and giant deer likewise belong to a substantially different ecological world from modern Ireland. Predators and scavengers followed their own opportunities: wolves hunted, while spotted hyaenas could accumulate bones in dens. Such animals were not exotic visitors in a familiar green Ireland. They belonged to a fluctuating tundra-steppe and wetland landscape, shaped by cold, seasonal scarcity and the approach of renewed glaciation.

The Castlepook Question

The most consequential possible human evidence is a reindeer femur from Castlepook Cave near Doneraile, County Cork. Examined in the National Museum of Ireland's historic collections, it bears a deep mark interpreted by zooarchaeologist Ruth Carden as a fresh-bone incision made with a sharp stone tool during butchery. Public heritage material places the bone broadly around 31,000 BCE. If that interpretation and association are upheld, it would indicate that people handled a reindeer carcass in Ireland during the Upper Palaeolithic, far earlier than the long-recognised evidence for post-glacial settlement.

Its importance should not be exaggerated. The original cave excavations pre-dated modern standards of stratigraphic recording, and the object was not recovered with an unquestionable occupation floor, hearth, stone-tool assemblage or human remains. A bone's date establishes when the animal died, not automatically when a surface mark was made. Nor can one modified specimen demonstrate whether a small party visited once, hunted repeatedly, crossed by a now-submerged route, or left descendants. It is best treated as significant but limited evidence for possible human activity, not as proof of a permanent Irish population.

Life Without a Chronicle

If people did reach Ireland around this broad period, their way of life would have been highly mobile and dependent upon knowledge of animals, terrain, weather and routes. The Castlepook evidence, if human-made, would support only the modest inference that someone possessed and used a sharp stone edge while processing a large animal. It does not reveal the group's language, numbers, kinship, shelter, clothing, hunting methods or origin. Comparable Upper Palaeolithic groups elsewhere in north-west Europe made sophisticated tools and maintained social networks, but importing those details wholesale into Ireland would go beyond the evidence.

There is no archaeological basis for political affairs, diplomacy, organised warfare, named communities or territorial boundaries in Ireland at this date. Nor is there evidence for trade in the usual sense, agriculture, herding, permanent villages or managed fields. No securely contemporary Irish object can demonstrate ritual practice, formal religion, art, burial custom or teaching. These absences are not claims that Ice Age people lacked beliefs, relationships or learning; they are limits on what the surviving Irish record can responsibly show.

Economy, where the evidence permits the term, was ecological rather than market-based. Large herbivores represented potential food, hides, sinew, bone and other useful materials for any people present, while wetland and open-ground resources structured the lives of animals. Butchery marks would testify to carcass processing, not necessarily to the killing of an animal, and a cave may have been a carnivore den rather than a human camp. The difference matters: interpretation must remain proportional to the object and its context.

An Ireland Repeatedly Remade

The deeper historical importance of this period lies in regional change. Ireland was neither permanently ice-covered nor a settled, forested island. It was a northern landscape repeatedly altered by ice advance, thaw, water, vegetation change and animal movement. Derryvree's organic silts preserve an

interval of freshwater life between glacial episodes; Castlepook's bones preserve traces of an animal community that later vanished from the island; the later ice sheet remodelled the terrain and removed much of the record that might have answered further questions.

For 31,074 BCE, then, the clearest history is environmental. Around this notional date, parts of Ireland could include cold, open and wetland habitats capable of supporting a varied Pleistocene fauna. The island's connection to the wider north-west European landmass made animal movement possible, and may have made short-lived human visits possible as well. Yet neither a specific journey nor a specific hunt can be dated to this calendar year. The evidence offers a compelling landscape, not an annual chronicle: a vanished Fermanagh fen, cave bones in Cork, and the gathering force of ice that would soon transform Ireland again.

Chapter 028 of 100

31073 BCE

Derryvree's Moss-Rich Mud^[28]



“31,073 BCE” is a useful filing label, not a date that prehistoric Ireland can be observed year by year. No written calendar, named individual, political event or securely dated occupation layer allows us to isolate a single modern year at this depth of time. In archaeological terms, the label belongs broadly to the Late Pleistocene, around 33,000 calibrated years before AD 1950, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. The responsible history of Ireland at this point is therefore a history of deposits, animal remains and changing ice margins, expressed through calibrated ranges and probabilities rather than false precision.

A Landscape Before Maximum Ice

Ireland was approaching, but had not yet reached, the fullest expansion of the last British-Irish Ice Sheet. The local Last Glacial Maximum came later: evidence from the Irish Sea and Atlantic shelf places major ice-sheet advances principally around 27,000 to 23,000 years ago, with regional differences in timing and behaviour. Around the notional date represented by 31,073 BCE, parts of Ireland were capable of sustaining open terrestrial and freshwater environments, although conditions were cold and liable to change sharply. It would be misleading to picture the entire island as either a continuous white wilderness or a hospitable northern woodland. The evidence instead suggests a patchwork of exposed ground, wetlands, streams, seasonally productive grazing and, in some regions, advancing or recently retreating ice.

Sea level was far lower than today because vast quantities of water were locked in northern ice sheets. Yet lower sea level did not make Ireland a simple extension of Britain or continental Europe. The Irish Sea remained a formidable marine barrier. This matters because it limits what can be assumed about animals and people. Some mammals evidently reached Ireland during the Pleistocene, but each species

had its own dispersal history, and no land bridge should be imagined automatically. For people, any visit would have required a sea crossing, although there is no securely documented human journey, boat, camp or shoreline site in Ireland that can be assigned to this particular horizon.

The Derryvree Record

The most instructive Irish environmental archive for the wider period lies at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed a drumlin section containing organic freshwater silts and fine sands enclosed between two substantial tills: sediments laid down by ice occur below and above the organic bed. This is powerful evidence that an interval of ice-free conditions separated at least two glacial episodes at that locality. The peat-like, moss-rich material is not a village floor, nor an annual diary, but it preserves a small part of a living landscape that later ice buried and sealed.

A conventional radiocarbon measurement from the Derryvree organic deposit, BIRM-166, was reported as $30,500 \pm 1,100$ radiocarbon years BP. Such an old determination must not be converted mechanically into one BCE year. Modern calibration produces a broad calendar range, commonly represented around 35,000–37,000 calibrated years BP, and the sample's age, context and legacy methodology all require caution. It is thus older than the modern label 31,073 BCE, but it remains directly relevant: it demonstrates that northern Ireland contained a cold-stage freshwater ecosystem during the pre-maximum part of the last glacial cycle. It does not prove that precisely the same pond, plants or animals existed in Fermanagh on the nominal year in question.

Plant and insect evidence from Derryvree has been interpreted as a treeless, tundra-like muskeg or fen environment. Mosses, sedges and other cold-tolerant wetland plants point to shallow water and saturated ground, while the wider assemblage indicates open country rather than closed forest. Such a setting could support summer growth, grazing and the small food webs on which larger animals depended, but it was austere. Long winters, frost action, short growing seasons and rapid climatic shifts would have shaped every aspect of life there. The evidence is regional and local: it cannot supply a weather report for all Ireland, but it corrects the simpler image of a wholly lifeless island before the ice reached its maximum.

Southern Caves and Ice-Age Animals

In north County Cork, Castlepook Cave near Doneraile provides a different archive. Its old excavations recovered bones from a mixed cave assemblage that has subsequently been reassessed with improved radiocarbon methods. The revision was important because several earlier dates proved too young: better pretreatment of bone collagen moved parts of the Castlepook fauna substantially further back into MIS 3. The cave demonstrates that southern Ireland was visited or inhabited by an Ice Age fauna including reindeer, giant deer and spotted hyaena; other finds from the cave system and region have also been attributed to such cold-stage animals as mammoth, bear, fox, hare and lemming. Not every species necessarily overlapped in time, and a cave assemblage is not a census of a single landscape.

Predators and scavengers are especially significant. Spotted hyaenas did not merely live beside a ready-made catalogue of prey: their denning, bone-moving and chewing could alter the archaeological record. Water, sediment movement, later digging and early twentieth-century excavation added further disturbance. Consequently, Castlepook is excellent evidence that animals ranged through Ireland during

parts of MIS 3, but it is poor evidence for a neatly preserved hunting episode. Its importance lies partly in that warning. A bone's date tells us when the animal lived; it does not automatically date a scratch, identify the agent that made it, or establish that every bone beside it belongs to the same moment.

The Human Question

A reindeer bone from Castlepook has attracted attention because a mark on it has been interpreted as consistent with cutting by a stone tool, and the associated animal material has been discussed in relation to a date of roughly 33,000 years ago. If that interpretation is eventually confirmed through detailed taphonomic study and securely associated evidence, it would indicate a fleeting Upper Palaeolithic human action in Ireland long before the Last Glacial Maximum. It would not, however, establish a settled population, a named culture, a permanent hunting station or an Irish community with an identifiable territory. No securely stratified stone-tool assemblage, hearth, dwelling, burial or occupation surface currently demonstrates such a society in Ireland at this time.

The firmer archaeological evidence for human activity on the island is much later. A cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare has radiocarbon ranges of about 12,810–12,590 calibrated BP and 12,810–12,685 calibrated BP, in the terminal Pleistocene. Even that claim continues to be discussed because caves preserve complicated histories. The chronological gap between that later evidence and the Castlepook question should make interpretation modest. Absence of proof is not proof that no person ever landed in MIS 3 Ireland; it means that archaeology cannot responsibly reconstruct a population, language, kinship system or routine way of life for 31,073 BCE.

No Politics, But Real Ecologies

There were no identifiable Irish politics, chiefs, diplomatic alliances, battlefields or territorial borders that the evidence can recover. "Conflict" is meaningful only in the ecological sense: predators competed for prey and carcasses, and animals responded to severe seasonal constraints. Equally, there is no evidence for organised religion, monuments, art, formal learning or trade on the island at this date. Should occasional people have reached Ireland, they may have carried knowledge, tools and social ties from elsewhere in north-west Europe, but that is an inference from wider Upper Palaeolithic patterns, not an Irish discovery. It must not be converted into a narrative of settlers, ceremonies or commerce.

The economy that can be responsibly described is that of the landscape itself. Wetland plants drew on short-season growth; herbivores could graze open ground; carnivores and scavengers followed animals or exploited carcasses. Reindeer, if present in a particular locality and season, would have been part of a mobile cold-country ecology rather than a domesticated herd. Nothing shows farming, stock-keeping, cereal cultivation, metalworking, pottery or exchange networks. Nor can the cave fauna establish a continuous human hunting economy. The material record is environmental first, archaeological only at its most tentative.

An Archive of Limits

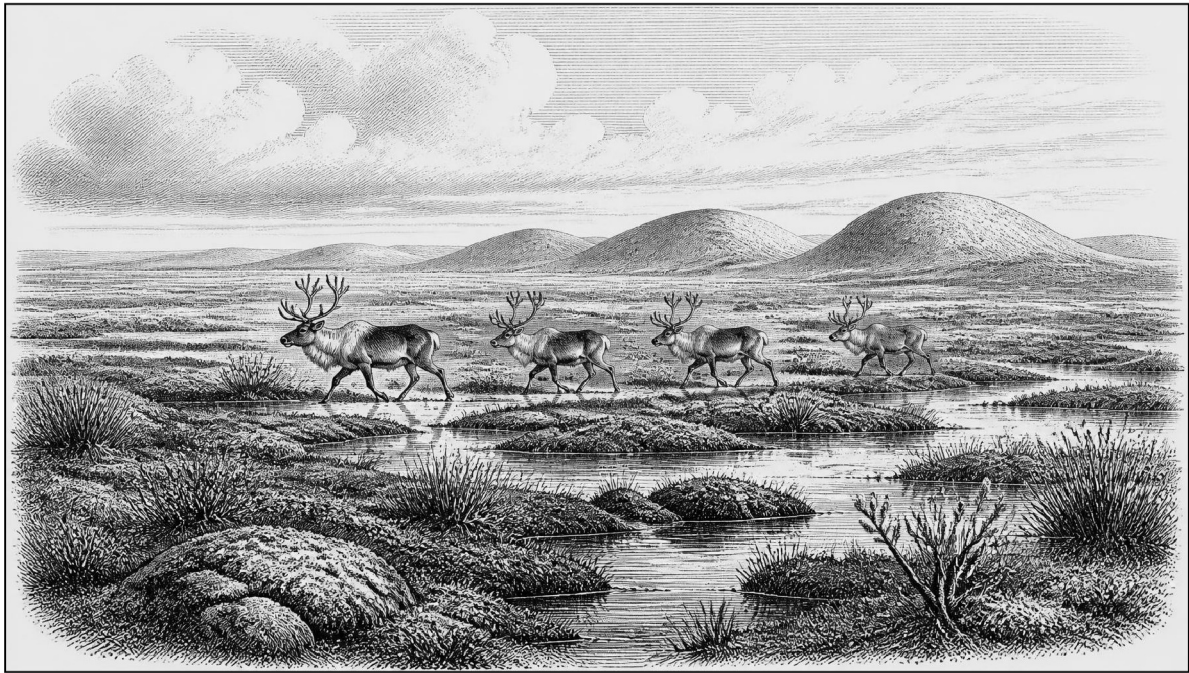
The most important development around this distant horizon was environmental rather than political: Ireland remained a changing northern island on the threshold of greater glaciation. Derryvree's buried wetland and Castlepook's re-dated fauna show that the island was not empty of life in the broad MIS 3 interval. They also show why Ice Age Ireland resists simple stories. Ice later destroyed, displaced or

concealed much of the evidence, while caves and rare sediment pockets preserve fragments from different moments. Around 31,073 BCE, Ireland can be seen clearly enough as a cold, open and ecologically active place; it cannot yet be described as the home of a known people, polity or culture. That distinction is not a failure of the record. It is the central historical fact of Ireland's deepest recoverable past.

Chapter 029 of 100

31072 BCE

Castlepook Femur Under Scrutiny^[29]



“31,072 BCE” is a modern chronological label, not a date at which Irish events can be narrated year by year. It falls about 33,022 years before the radiocarbon convention of AD 1950, in the later part of the Last Glacial Period. At this depth in time, archaeological and environmental dates have broad error ranges, and radiocarbon determinations must be calibrated into calendar-year ranges. No excavated Irish settlement, individual, political event or seasonal episode can responsibly be assigned to this particular year.

The most defensible picture is therefore regional and approximate. Around 33,000 calibrated years before present, Ireland lay within Marine Isotope Stage 3, a long, climatically unstable span preceding the fullest extent of the last British–Irish Ice Sheet. Ice was expanding on a regional scale, but Ireland was not simply a single, permanent white sheet. The evidence includes an important buried wetland in County Fermanagh and cave-bone assemblages in southern Ireland. Together they show an open, cold and changeable landscape, with local freshwater habitats and a fauna unlike that of the modern island. They do not amount to a record of an Irish population, state or culture.

A Date Without a Diary

The distinction between a numbered BCE year and archaeological time matters especially here. Radiocarbon dates are expressed as years before present, where “present” means AD 1950, and their conversion to calendar years depends on an internationally maintained calibration curve. Beyond the range of securely dated annual tree rings, calibration necessarily draws on several natural archives and carries wider uncertainty. A date such as 31,072 BCE is useful for placing a page in chronological order; it cannot identify a day, generation or event in Pleistocene Ireland.

Nor should “Ireland” be imagined as the familiar modern island with its present coastlines, vegetation and seas. Global sea level was much lower than today because immense quantities of water were held in northern ice sheets. Yet routes between Ireland, Britain and continental Europe changed repeatedly as ice, sea level and local topography changed. Fossil animals prove that some species reached Ireland at various times; they do not by themselves demonstrate a particular land bridge, coastline or migration route at a particular moment. The Irish Sea was a changing geographical problem rather than a fixed national frontier.

Derryvree’s Cold Wetland

The closest major environmental archive to this notional date was exposed in 1969 at Derryvree, near Maguiresbridge in County Fermanagh. Road works cut through a drumlin and revealed freshwater silts and fine sands lying between two tills: sediment deposited by an earlier glacier below, an organic freshwater sequence, then sediment left by a later ice advance above. That order is powerful evidence. It shows that the site experienced a period without local glacier cover long enough for standing or slow-moving water, plants, insects and fine sediment to accumulate, before renewed glaciation sealed the deposit.

Organic material from the Derryvree freshwater series produced a conventional radiocarbon age of about 30,500 BP, with a substantial uncertainty. Calibrated treatments place the relevant sequence broadly around 36,900–31,700 cal BP. The range overlaps 31,072 BCE, but it does not permit the assertion that a particular pool or plant existed in that single numbered year. Its importance is different: it gives a rare, direct glimpse of the kinds of environments that could occur in northern Ireland during this late Pleistocene interval.

The flora and fauna point to a treeless, periglacial wetland or muskeg rather than forest. Pollen of herbaceous plants, moss macrofossils, insects and other remains indicate cold open ground, wet hollows and freshwater. Reported plants include grasses and sedges, dwarf willow, mountain-avens, Arctic-alpine clubmoss, bogbean and water-milfoil. Bogbean and water-milfoil are especially useful reminders that even a harsh climate contained small-scale ecological variety: pools, marshy margins and waterlogged ground could exist amid sparse terrestrial vegetation. The evidence supports cold winters, short growing seasons and an exposed landscape; it does not establish an unbroken frozen wilderness.

This northern record also cautions against treating climate as uniform across Ireland. A wetland beneath a Fermanagh drumlin records local conditions at one site. It cannot describe every valley, upland, coast or cave in the island. But it demonstrates that at least some parts of Ireland had ice-free terrain and functioning freshwater ecosystems during a wider period of climatic deterioration.

Castlepook’s Mixed Bone Record

In County Cork, Castlepook Cave near Doneraile provides another essential, though very different, source. Its limestone passages have yielded one of Ireland’s richest late Pleistocene vertebrate assemblages. The collection includes remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, mountain hare and spotted hyaena. Such a list should not be turned into a single imagined herd moving across Cork in 31,072 BCE. Cave deposits accumulated over long intervals; bones may have been brought in by carnivores, water, gravity or people, and many were excavated in the early twentieth century, when recording standards were unlike those expected today.

Direct radiocarbon dating and later reassessment have nevertheless established that southern Irish caves preserve faunal evidence from before the Last Glacial Maximum. The Irish Quaternary Fauna Project showed that a varied mammal fauna reached Ireland between at least about 45,000 and 20,000 years ago. Re-dating studies have also shown why each specimen demands caution: older measurements can be affected by preservation, contamination and improved laboratory pretreatment, while a cave assemblage may combine remains of very different ages. Castlepook is therefore best understood as evidence for repeated animal presence in changing Ice-Age landscapes, not as a snapshot.

For the period around this article's date, reindeer, mammoth and hyaena are historically significant because they accord with the open, cold habitats suggested by Derryvree. Large herbivores could exploit patches of grassland, sedge-rich terrain and other low vegetation; predators and scavengers followed the opportunities created by such animals. Their presence confirms that Ireland could sustain substantial terrestrial mammals during some pre-maximum intervals. It does not prove that all species lived together, or that their population sizes were large and continuous.

The Marked Reindeer Femur

Castlepook is also central to the difficult question of human presence. A reindeer femur from the cave has been reported as bearing a deep linear modification interpreted as a fresh-bone cut or chopping mark made with a sharp stone tool. The bone has been publicised as approximately 33,000 years old, making it highly relevant to this broad chronological horizon. If the mark is securely shown to be anthropogenic and contemporary with the animal's death, it would be remarkable evidence that an Upper Palaeolithic person handled a reindeer in Ireland long before the Last Glacial Maximum.

That conditional wording is essential. A radiocarbon result dates the death of the animal, not automatically the act that marked its bone. A single modified bone from an old, complex cave collection cannot establish the size, duration or character of a human presence. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, repeatedly occupied camp or contemporaneous food-processing area has been published from Castlepook for this horizon. Carnivore damage, sediment movement and the history of excavation all require specialist taphonomic scrutiny. The femur is an important claim and a promising research problem, not a licence to populate Ireland with a known Palaeolithic community.

The contrast with the better documented late Upper Palaeolithic bear patella from Alice and Gwendoline Cave in County Clare is instructive. That bone has direct calibrated dates of roughly 12,810–12,590 cal BP and 12,810–12,685 cal BP, and has been interpreted as butchered. It is far later than the present horizon. Its existence shows that careful re-examination and direct dating of old museum collections can transform Irish prehistory, while also showing why each claim must retain its own chronology and evidential status.

No Politics, But a Human Question

There is no evidence for political affairs, diplomacy, warfare, social hierarchy, religious practice, language, art, formal learning, farming or trade in Ireland around 31,072 BCE. There were no known farms, monuments, metal objects, writing systems or named peoples. It would be misleading to fill the silence with analogies from later Irish prehistory, or with detailed reconstructions borrowed from Upper Palaeolithic societies elsewhere in Europe.

If people did reach Ireland during this broader interval, the landscape would have demanded mobility, practical knowledge of seasonal resources and the ability to cross or negotiate a variable seaway and icy terrain. Those are reasonable ecological inferences, not established facts about an Irish group. We cannot say whether any visitors stayed briefly, returned repeatedly, travelled in family groups, hunted reindeer, used caves as shelter or departed without leaving further trace. Nor can we determine whether human absence in the record means genuine absence or simply the destruction and burial of shallow sites by subsequent ice advances, erosion and sea-level change.

Approaching the Ice Maximum

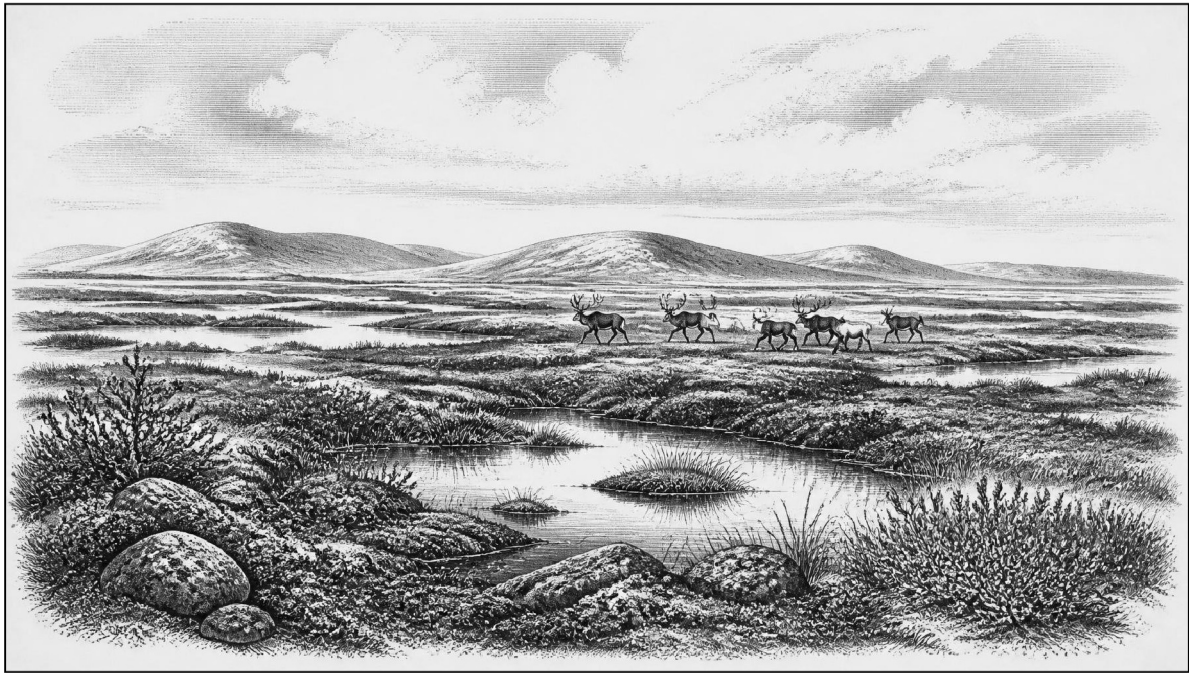
The largest development shaping Ireland was environmental rather than political: the growth of the British–Irish Ice Sheet. Reconstructions show that ice-sheet expansion and maximum extent varied markedly by sector rather than occurring everywhere at once. The ice sheet eventually occupied most of Ireland and adjacent shelves, eroding land surfaces and obscuring older evidence. Its maximum areal extent is generally placed around 26,000 years ago, with maximum ice volume later, around 23,000 years ago. Those milestones lay thousands of years in the future of 31,072 BCE, but the colder, unstable conditions leading towards them were already transforming habitats.

Thus Ireland at this point is illuminated not by chronicles but by sediments and bones. Derryvree preserves a cold freshwater mosaic beneath later ice; Castlepook preserves the remains of animals that crossed a very different Ireland; the marked reindeer femur raises, but does not settle, the possibility of an extraordinarily early human visit. The responsible history of 31,072 BCE is consequently one of calibrated ranges, fragmentary survival and disciplined uncertainty. Its most important fact is not a dated event, but the emergence of evidence that Ireland was an inhabited ecological frontier on the eve of far more extensive glaciation.

Chapter 030 of 100

31071 BCE

Derryvree's Clubmoss Silt^[30]



The modern label 31,071 BCE cannot identify an event in Ireland in the way that it can for a medieval battle or a parliamentary session. It is a retrospective point in a calendar that did not exist for the people, animals or landscapes of the Late Pleistocene. In conventional calendar arithmetic it lies about 33,020 years before AD 1950, the reference point used for ‘BP’ dating, but that is not itself a radiocarbon determination. Archaeology cannot resolve Irish evidence of this age to a single calendar year. The responsible view is therefore of a broad interval within Marine Isotope Stage 3, using calibrated ranges and carefully dated deposits rather than an invented annual chronicle.

At this point, the land now called Ireland was part of a climatically volatile north-west European world. Temperatures, snowfall, sea level, vegetation and ice margins changed repeatedly over millennia. The great expansion of the last British–Irish Ice Sheet lay ahead rather than being a single instantaneous event: evidence indicates major growth after roughly 32,000 years ago, with extensive ice reaching its maximum limits later, during the Last Glacial Maximum. Conditions around the island were consequently precarious and regionally varied. It is misleading to picture either a uniformly ice-covered Ireland or a stable, fully habitable country.

An Interval Preserved Beneath Till

The most revealing Irish evidence for the wider period comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed organic freshwater silts and fine sands trapped between two substantial layers of glacial till. This was an exceptional survival. Later glaciers had overridden much of Ireland, eroding, mixing and burying older ground surfaces; at Derryvree, a small environmental archive endured beneath the younger ice-borne sediment.

The original radiocarbon determination from the organic deposits was 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. That result is not equivalent to a precise BCE year. With its wide laboratory uncertainty and the non-linear nature of radiocarbon calibration at this antiquity, it denotes a broad calendar-age window in the mid-30,000s cal BP, rather than a date capable of confirming conditions on 31,071 BCE itself. The nominal year belongs near the end of the broad time horizon to which Derryvree is relevant, but the deposit is evidence for an interval, not a diary.

Its fossils nevertheless say a great deal. Freshwater mosses, sedges and other plant remains, together with cold-adapted insect evidence, indicate open tundra-like vegetation and a periglacial regime. Clubmoss spores are among the small but evocative traces recovered from the sediments. There was standing or slow-moving freshwater locally, vegetated margins and seasonally productive wet ground, but no evidence for a closed temperate forest. Grasses, sedges, herbs, low shrubs, mosses and sparse patches of hardy vegetation better fit the record. Frost, short growing seasons and exposed ground constrained life even where ice was absent.

Cold Country, Not Empty Country

Derryvree should not be turned into a panoramic reconstruction of all Ireland. It records one locality in what is now northern Ireland, and its flora and fauna were deposited under particular hydrological conditions. Yet comparable inter-till deposits at Hollymount near Maguiresbridge and Greenagho near Belcoo support the larger conclusion that parts of Fermanagh experienced cold, non-glacial episodes between advances of ice. The evidence is especially important because it demonstrates environmental change rather than simple permanence: open land and freshwater habitats could exist, then be buried by renewed glaciation.

South-western Ireland supplies a different kind of record. Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, produced an important collection of Late Pleistocene animal remains. Reindeer, brown bear, wolf, Arctic fox, mountain hare, lemmings, spotted hyaena and woolly mammoth have all been identified from the wider cave assemblage. The collection shows that Ireland supported, at various times before the Last Glacial Maximum, a far richer large-mammal fauna than the island has known in recent millennia.

That qualification — *at various times* — is essential. A cave deposit is not automatically a single living community. Bones may be carried in by predators, water or sediment movement; material from separate episodes may be mixed by excavation; and antiquarian investigations at Castlepook, undertaken principally between 1904 and 1913, did not meet modern recording standards. Direct dating has also transformed the chronology. Improved pretreatment and accelerator radiocarbon methods have shown that some earlier dates from Irish cave bones were thousands of years too young. Castlepook is therefore invaluable, but its assemblage cannot responsibly be presented as a crowd of mammoths, hyaenas and reindeer sharing one valley in one year.

Animals, Predators and Possible Visitors

Even with that caution, the animal record illuminates the economy of nature. Reindeer were well adapted to open cold-country habitats, moving through landscapes in which grazing and browsing opportunities were unevenly distributed. Hares, lemmings and Arctic foxes point towards severe conditions. Wolves and spotted hyaenas indicate competing large predators and scavengers. Mammoth remains attest to the presence, at least in the broader pre-maximum interval, of animals associated with

extensive open grassland or steppe-tundra mosaics. Such evidence supports a picture of mobile animal populations following food, shelter and seasonal routes, rather than a permanently settled ecological balance.

One Castlepook object has made the question of people especially consequential: a reindeer femur reported to carry a deep mark interpreted as a cut or chop made by a sharp stone tool. The bone has been publicised as roughly 33,000 years old and as possible evidence of carcass processing by a human visitor. If the interpretation is confirmed through fuller publication, microscopic study, secure dating and contextual evidence, it would extend the known story of human activity in Ireland dramatically earlier than the firmly investigated terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

For 31,071 BCE, however, the mark must remain a proposition, not a foundation for a settled population. There is no securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or settlement site of this age in Ireland. A modified bone cannot establish whether one or more people arrived briefly to hunt or scavenge, whether they travelled as a small group, or whether they returned repeatedly. Nor does it prove that descendants remained after the climate deteriorated. The evidence permits possible human presence; it does not permit a named hunting party, an origin story or an unbroken occupation.

No Politics, No Proven Trade

There were consequently no recoverable political affairs for this notional year. Archaeology supplies no Irish chiefdoms, territories, diplomatic relationships, organised armies or formal institutions at this date. Conflict can only be discussed in the ecological sense: carnivores competed over carcasses, while cold, hunger and changing access routes imposed relentless pressures on every animal. Likewise, there is no evidence for agriculture, herding, metallurgy, markets, long-distance exchange systems, monuments, formal religious sites or writing. To assign any of these to Ireland around 31,071 BCE would be invention.

If people did reach the island or its then-expanded margins, their social world would have been that of highly mobile Palaeolithic foragers, not later Irish farming communities. Their knowledge, if present, would have resided in practical skills: reading animal movements, choosing shelter, using fire, making and maintaining tools, and navigating dangerous seasonal ground. None of those capacities is directly documented in an Irish assemblage of this age. They are reasonable inferences from contemporary human populations elsewhere in Europe, but they must not be mistaken for discoveries at Derryvree or Castlepook.

Travel itself remains unresolved. Global sea level was lower than today, exposing areas of the continental shelf, but the practical geography of movement depended on ice margins, rivers, marine channels, boggy ground and changing coastlines as much as on lowered water. Ireland's connection with Britain and continental Europe cannot be reconstructed as a simple, permanent land bridge for this particular moment. Animal remains demonstrate that mammals reached Ireland during parts of the Late Pleistocene; they do not map the exact route, season or conditions of each crossing.

The Approaching Ice

The chief historical development appropriate to this date was environmental instability. Derryvree records a cold freshwater landscape available between glacial advances. Castlepook preserves evidence that a diverse fauna occupied Ireland during the longer Marine Isotope Stage 3 interval. Subsequent

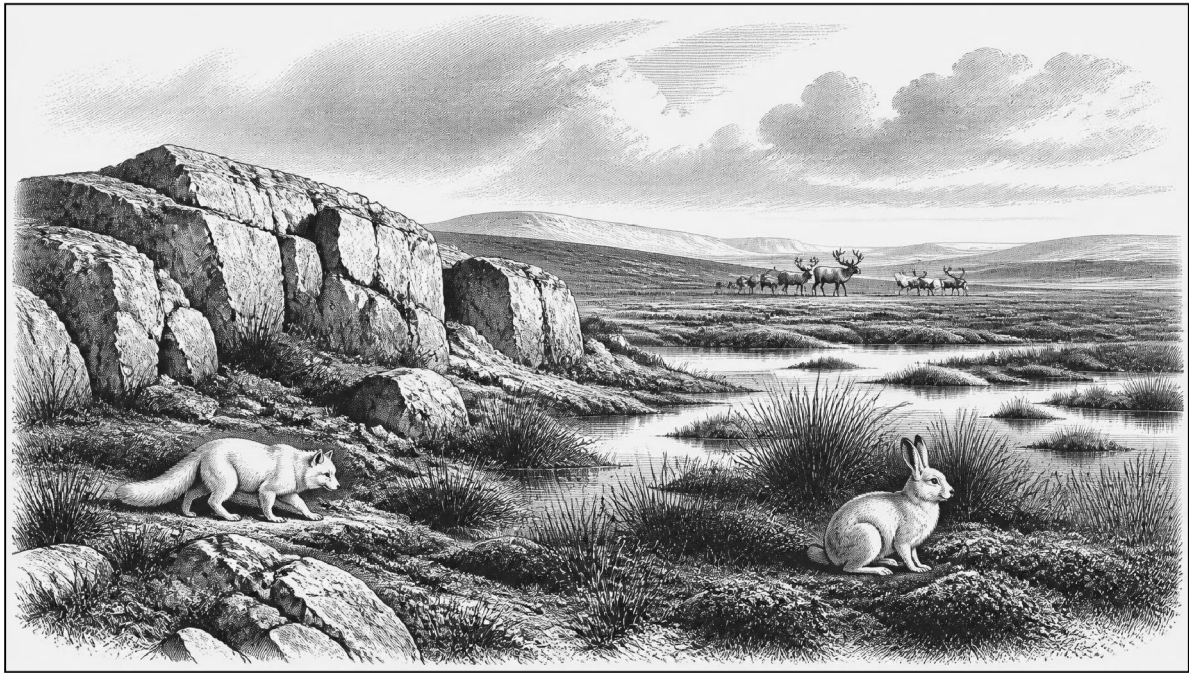
growth of the Irish component of the British–Irish Ice Sheet would reshape the land, erase or bury many older surfaces and sharply alter the prospects for plants, animals and any human visitors. The future ice advance is why these fragmentary deposits matter: they preserve a world that was neither modern Ireland nor a timeless frozen void.

Thus the best account of Ireland around 31,071 BCE is deliberately modest. The firm evidence is for open, cold and locally wet landscapes; for animals suited to a harsh Pleistocene environment; and for climate and ice sheets that repeatedly changed the available territory. The possible evidence is a humanly modified reindeer bone from County Cork. Between the two lies the discipline of prehistoric history: treating silt, spores, bones and dates as powerful witnesses, while refusing to make them say more than they can.

Chapter 031 of 100

31070 BCE

Castlepook's Faunal Borderland^[31]



31,070 BCE is not a year to which Irish archaeology can attach an event, a ruler, a journey or a settlement. It is a modern, retrojected calendar label, roughly equivalent in arithmetic to 33,000 calibrated years before 1950. At this depth in time, even carefully dated deposits normally provide ranges of centuries or millennia, not a historical calendar. The responsible view is therefore regional and probabilistic: Ireland lay within the Late Pleistocene, during Marine Isotope Stage 3, in a climatically unstable North Atlantic world that was moving towards the great expansion of the last British–Irish Ice Sheet.

A Landscape Before the Maximum

This was long before the Last Glacial Maximum, when the island was more extensively covered by ice and the ice sheet reached its greatest volume around 23,000 years ago. Yet it was not a benign pre-glacial countryside. Ice sheets and local glaciers had repeatedly altered the Irish landscape during earlier cold stages; permafrost, seasonal freezing, powerful meltwater and sparse vegetation were important agents of change. Recent reconstructions of the British–Irish Ice Sheet begin their detailed sequence at about 31,000 years before present, but they also emphasise that advance was uneven. Conditions at any one Irish locality depended on altitude, distance from the Atlantic, changing snowfall and whether ice margins lay nearby.

It would be misleading to picture all Ireland as either an unbroken ice cap or a uniformly open plain in this notional year. The surviving evidence is patchy and comes from different places and dates. What it does show is a country of severe environmental contrasts. Some lowland and coastal areas could support

cold-adapted animals and plants during ice-free intervals; high ground and western maritime margins responded differently to climate and accumulating ice. Later glaciers then removed, reworked or buried much of the evidence that might have preserved a fuller record.

Wetlands Beneath Later Ice

One important window lies at Derryvree near Maguiresbridge in County Fermanagh. There, organic silts sealed between glacial deposits have yielded plant remains from a treeless, cold-climate wetland or muskeg. Mosses, sedges and herbs, together with plants such as bogbean, water-milfoil, dwarf willow and mountain-avens, indicate shallow freshwater, saturated ground and open tundra-like vegetation rather than woodland. The deposit is immensely valuable because it records life between episodes of glaciation. It is not, however, a diary entry for 31,070 BCE, nor proof that the entire island shared precisely the same habitat at the same moment.

The Derryvree material is best used to establish possibilities: parts of Ireland could contain pools, sedge marshes and low vegetation during cold, largely treeless intervals in the later Pleistocene. Such places would have been seasonally productive. They could sustain insects, small mammals and grazing animals, while also offering water and shelter to predators. But the sequence's age, its relationship to separate ice advances and the representativeness of one Fermanagh basin remain subjects for geological interpretation. An ancient wetland is evidence for its own locality first, and only cautiously for Ireland more widely.

Castlepook's Animal Evidence

The chief Irish faunal assemblage relevant to this broader period comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork. Excavations and collecting there recovered bones from a remarkable cold-stage community: reindeer, woolly mammoth, giant deer, mountain hare, lemmings, foxes, wolves, bears and spotted hyaenas. A mammoth bone was radiocarbon dated to $33,500 \pm 1,200$ radiocarbon years before present, while a hyaena bone has produced a broadly comparable result. Those are uncalibrated radiocarbon determinations, not calendar dates; when calibrated, they point substantially further back than the numerical radiocarbon ages suggest.

The cave fauna cannot be compressed into a single living herd or a single season. The original excavations took place early in the twentieth century, before modern standards of stratigraphic recording, and the cave's galleries contained deposits of more than one age. Some specimens may have been moved by water, carnivores or later disturbance; the occurrence of animals unsuited to a cold open environment warns against assuming that every bone belonged to one assemblage. Even so, the repeated presence of cold-stage mammals makes Castlepook the strongest direct indication that southern Ireland could support a varied Pleistocene fauna in the millennia before the climatic maximum.

Hyaenas are especially revealing. Their bones, teeth and traces of feeding show that caves were not simply shelters waiting for people: they were part of a predator's landscape. A mammoth or reindeer carcass might be consumed, scattered and redeposited by several agents. Reindeer may have moved through open country in seasonal herds; mammoths required extensive forage; wolves and hyaenas competed over carrion and prey. This is a reason for caution as well as for imagination. Animal bone records a living ecosystem, but cave accumulation is not a straightforward census of every species outside its entrance.

The Human Question

A reindeer femur from Castlepook has made this period unusually important in the history of Irish archaeology. Re-examination has identified a deep mark interpreted as consistent with cutting or chopping by a sharp stone implement, and the bone has been reported as about 33,000 radiocarbon years old. If that interpretation is confirmed through further microscopic study, secure contextual work and additional finds, it would be evidence for human handling of a carcass in Late Pleistocene Ireland far earlier than the island's formerly accepted human record.

That conclusion must remain carefully limited. The dated bone establishes the age of the animal, while the mark must separately be shown to be human-made and contemporaneous with butchery. Castlepook has not yet produced a securely associated stone-tool assemblage, hearth, dwelling surface, human burial or repeated concentration of butchered animals from this phase. Nor can one marked bone identify the people involved, their language, ancestry, route of arrival, group size or length of stay. At most, it raises the serious possibility of a brief hunting or scavenging visit during a period when the island's environmental conditions allowed such movement.

Movement, Not a Known Homeland

Lower global sea levels altered the geography of north-west Europe, exposing parts of today's continental shelf. Whether a practicable land connection linked Ireland and Britain at particular points in the Late Pleistocene has long been debated, because ice loading, crustal movement, local relative sea level and topography all mattered. It is unsafe to assume a simple permanent land bridge in 31,070 BCE. Nor does the Castlepook evidence demonstrate one. It does show why the question matters: the arrival of mammals, and any possible human visitors, depended on changing corridors across a landscape that is now partly drowned, buried or glacially transformed.

No political affairs, warfare, diplomacy, religion, art, language, exchange network or social hierarchy can responsibly be described for Ireland at this date. There is likewise no evidence for farming, permanent villages, pottery, monuments or organised trade. If people did reach the island, their economy would have depended on mobile hunting, scavenging and close knowledge of cold-country animal behaviour; that is an inference from the possible butchery trace and the fauna, not a demonstrated description of an Irish community. The most secure history here is environmental: a precarious northern borderland in which animals, ice, water and weather shaped the possibilities of life.

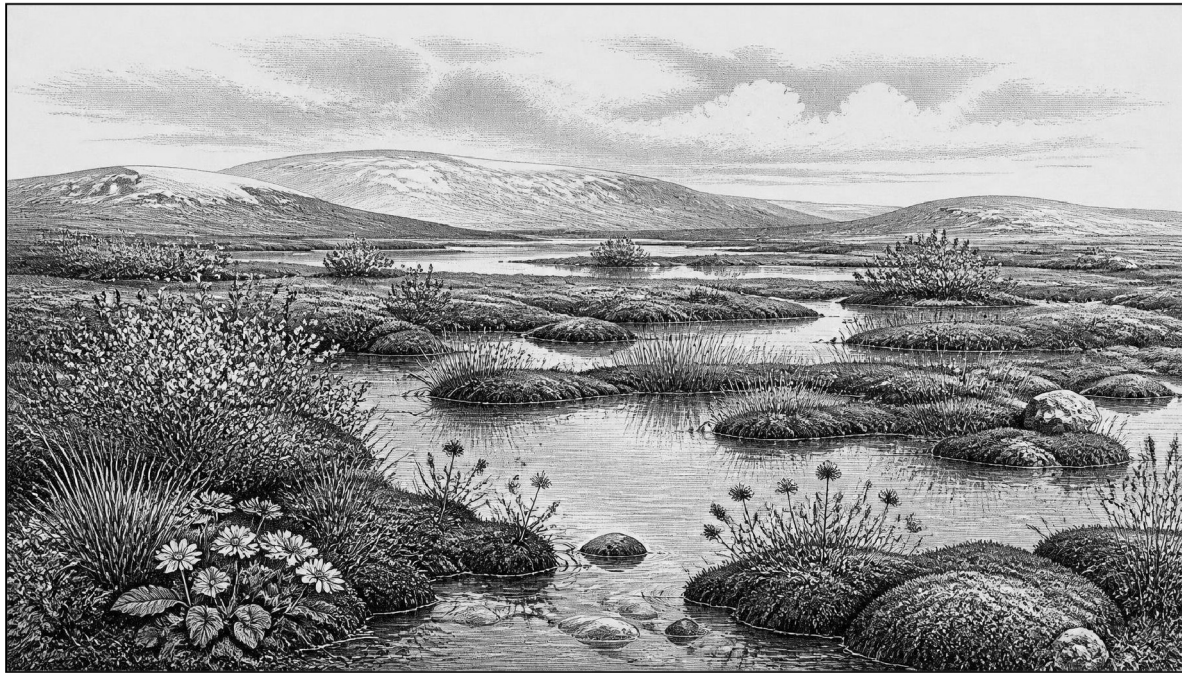
What the Date Can Mean

For 31,070 BCE, Ireland's archive is not a chronicle but a collection of difficult witnesses: cave bone, a cutmark under debate, pollen and plant macrofossils in buried silts, glacial sediments and offshore cores. Calibrated age ranges and stratigraphic relationships are more meaningful than the apparent precision of a single BCE year. The major development was the approach of a harsher glacial world, not an identifiable political or cultural episode. Castlepook and Derryvree preserve rare evidence that, before later ice remade so much of the island, parts of Ireland supported open wetlands and a striking cold-stage fauna. Whether people briefly shared that world remains one of the most consequential unanswered questions in Irish prehistory.

Chapter 032 of 100

31069 BCE

Derryvree's Fossil Plant Census^[32]



31,069 BCE is a modern chronological label, not a year that can be recovered from Ireland's prehistoric record. It falls about 33,018 years before AD 1950, the conventional reference point for “before present” dating, within Marine Isotope Stage 3 of the last Ice Age. No Irish calendar, settlement sequence, named individual or securely dated event allows historians to describe this particular year. The responsible approach is therefore to examine the archaeological and environmental evidence whose broad ranges overlap it, and to keep demonstration separate from interpretation.

The closest unusually informative Irish archive is not a human site but a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Excavations exposed it in 1969 when roadworks cut through a drumlin. Fine sands, silts and organic material lay between two thick sheets of till, the unsorted debris deposited by glacier ice. That sequence provides a firm relative order: ice had occupied or influenced the place; a freshwater landscape then existed there; later glaciation buried it. It does not offer an annual diary.

A Date Within a Long Interval

Organic material from Derryvree produced a conventional radiocarbon determination of 30,500 +1,170/-1,030 radiocarbon years BP. Radiocarbon years are not identical to calendar years, especially at this depth of time. Calibration with modern northern-hemisphere curves yields a wide probability range, often expressed broadly as c. 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The requested year falls inside that span, but this overlap must not be overstated: it cannot identify a particular season, layer, pond or generation at Derryvree.

The site belongs to the Middle Midlandian, the Irish regional terminology for part of the last glacial cycle, and broadly to MIS 3. Across the North Atlantic, climate during MIS 3 changed abruptly between colder stadials and relatively milder interstadials over centuries and millennia. Ireland was therefore not a landscape in a single, unchanging condition. The Derryvree deposit demonstrates that this part of Fermanagh was at one stage free of overriding ice and capable of sustaining freshwater life. It does not demonstrate that every district of Ireland was simultaneously ice-free, nor that present coastlines, rivers and hills had their modern appearance.

Water Between the Tills

Derryvree's evidence is powerful because several kinds of fossil survive together. Pollen was poorly preserved, but plant macrofossils, mosses and insect remains indicate an open, cold environment. Freshwater mosses and sedges, together with bogbean, alternate water-milfoil, dwarf willow and mountain-avens, point to wet ground and shallow water within a largely treeless tundra or tundra-like mosaic. The vegetation was not an empty wilderness. It was low, seasonal and resilient: mossy margins, sedge-rich patches, herbs and dwarf shrubs made use of a short growing season.

Such evidence supports a picture of a periglacial wetland, shaped by frost, snowmelt and fluctuating water levels. In places it may have resembled muskeg: waterlogged ground with vegetation growing among pools and muddy channels. Yet it would be misleading to turn this reconstruction into a painted panorama of all Ireland. Fossils establish that these species or closely comparable communities occurred near this particular water body. Their abundance in samples does not directly measure a whole island's tree cover, summer temperature, animal numbers or the ease with which people could travel through it.

The location is also archaeologically instructive. Later ice advance sealed the organic bed beneath till, preserving a fragment of environmental history while destroying or obscuring much else. Ireland's older Pleistocene record is patchy partly for this reason. Glaciers eroded surfaces, redeposited sediment and changed drainage routes. Absence of a campsite, hearth or stone-tool scatter from the exposed Derryvree beds is therefore not proof that nobody ever travelled through the broader region; equally, it is no basis for assuming occupation.

Animals in a Changing Ireland

For a wider animal context, Castlepook Cave near Doneraile in north County Cork is indispensable. The cave has yielded Ireland's richest known assemblage of Late Pleistocene vertebrate remains. Its collections include reindeer, giant deer, brown bear, wolf, fox, hare, lemmings, mammoth and spotted hyena, with radiocarbon determinations showing that different animals belonged to different episodes rather than one simultaneous community. Reindeer and giant deer dates in the broader pre-maximum interval are especially relevant to a landscape around 33,000 calendar years ago.

These bones show that Ireland could support, or at least receive, sizeable cold-stage mammals at various times. They also indicate ecological connections beyond the island: animal populations could not have appeared from nowhere. Lower sea levels altered coastlines and exposed parts of the continental shelf, while ice, rivers, marshes and sea channels created shifting barriers and corridors. Precisely how readily any given route could be crossed at 31,069 BCE remains uncertain. It is safer to say that Ireland formed part of a changing north-west European ecological zone than to assert a simple, permanent land bridge.

Castlepook must nevertheless be read carefully. Many of its bones were recovered during early excavations, and cave deposits can be disturbed by animal activity, water, collapse and later digging. A list of species is not a census from a single year or proof that mammoths, hyenas, reindeer and people stood together outside the cave. Some remains were accumulated by carnivores; caves are often traps, dens, hibernation sites or repositories for material moved from elsewhere. The faunal record is compelling evidence for a changing Ice Age animal world, not a complete food web.

The Reindeer Femur Question

A reindeer femur from Castlepook has brought a possible human dimension to this period. Re-examination identified a deep mark interpreted as having been made on fresh bone by a sharp stone implement during carcass processing. The animal has been presented as about 33,000 years old. If that interpretation and association are upheld, it would be evidence that Upper Palaeolithic people handled a reindeer in Ireland far earlier than the island's securely documented post-glacial settlement record.

It would not, however, establish a permanent colony, a village or an Irish hunting society. The specimen comes from an old cave collection rather than a modern excavation of an intact living surface containing tools, hearths and repeated occupation layers. A bone date chiefly dates the animal's death; the assessment of a mark as human-made is a separate zooarchaeological judgement. The most cautious conclusion is that Castlepook offers a serious but limited indication of possible human presence or visitation during the broader period. It does not permit named groups, population estimates or a narrative of sustained settlement.

No Politics, No Diplomacy

There is no evidence from Ireland around this date for political institutions, territorial rulers, warfare, diplomacy, law or collective identities that can responsibly be named. There is likewise no direct Irish evidence for houses, clothing, ritual places, graves, art, spoken languages, teaching or exchange networks. The wider European Upper Palaeolithic demonstrates that humans elsewhere could make sophisticated stone tools, ornaments and images, but contemporaneity elsewhere cannot be transferred automatically to Ireland.

Should the Castlepook interpretation prove sound, the likely human activity implied is practical and brief: the processing of an animal. That would suggest knowledge of cutting tools and the value of meat, marrow, hide or sinew, but none of those uses is preserved on the bone with enough certainty to reconstruct a meal, camp or economy. Trade is wholly unproven. A visitor or small party could have moved through a landscape used by animals without leaving a durable settlement trace; that is a possibility, not a demonstrated social history.

Approaching the Great Ice Expansion

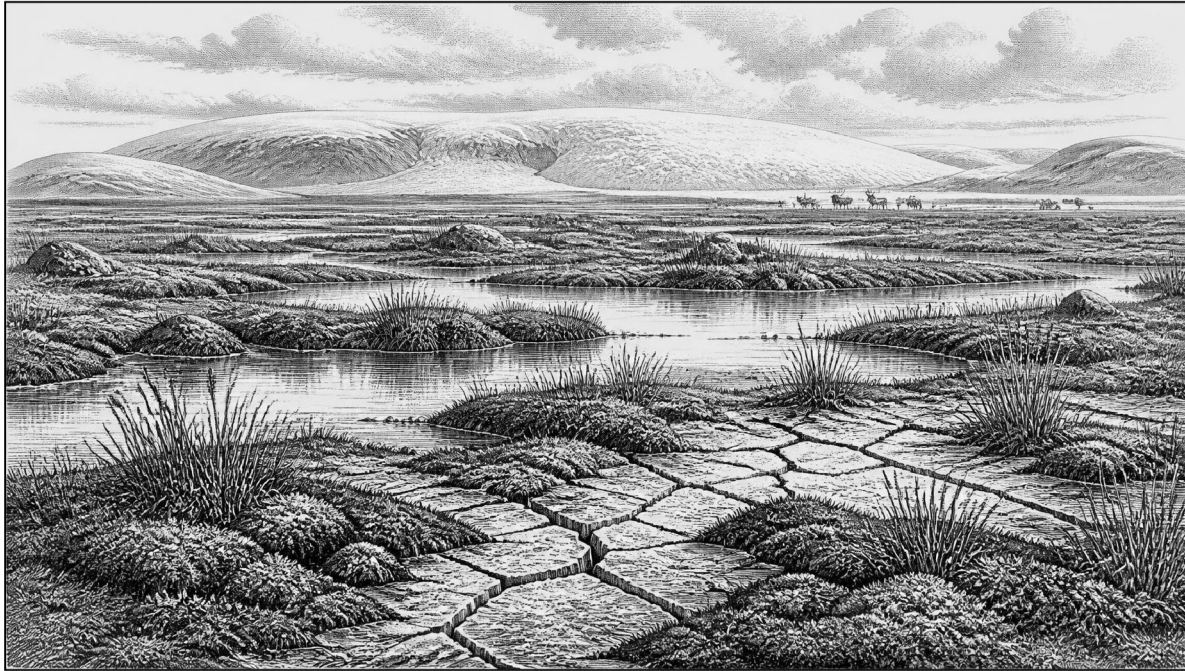
The interval around 31,069 BCE preceded the main maximum growth of the last British–Irish Ice Sheet. BRITICE-CHRONO research places the ice sheet's greatest overall volume later, around 23,000 years ago, while regional advances varied substantially. Derryvree's position between tills is a reminder that glaciation was episodic and geographically uneven. By the later Last Glacial Maximum, extensive ice profoundly remodelled the island, helping to explain why the evidence for earlier landscapes and people is so fragmentary.

The enduring significance of this date is therefore environmental rather than eventful. Derryvree records living freshwater vegetation in cold Fermanagh between phases of ice; Castlepook records animals adapted to, or passing through, changing Ice Age conditions in Cork; one marked reindeer bone raises a carefully bounded question about people. Together they replace an outdated image of a uniformly frozen, lifeless Ireland with a more precise one: a region of local habitats, mobile fauna, unstable climate and incomplete evidence. The year itself remains beyond historical resolution, but the deposits around it reveal an Ireland whose future archaeological record was already being buried beneath advancing ice.

Chapter 033 of 100

31068 BCE

BIRM-166's Tundra Ledger^[33]



The label 31,068 BCE is useful for arranging a long chronology, but it cannot describe a known Irish year. No contemporary calendar, written record, settlement horizon or securely dated human activity allows events in Ireland to be fixed to this particular year. The appropriate setting is the Late Pleistocene, within Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last glacial cycle. The closest evidence consists of deposits and fossils dated across broad ranges. Most importantly, a buried freshwater sequence at Derryvree near Maguiresbridge, County Fermanagh, offers a rare glimpse of an ice-free, cold landscape. It records environmental conditions, not an annual narrative.

Dating a Calendarless Landscape

The numerical year corresponds approximately to 33,018 years before the conventional radiocarbon reference year of 1950. That comparison must not be mistaken for a direct conversion. Radiocarbon ages and calendar ages are not identical, especially at this depth in time, where the calibration curve contains substantial uncertainty. Organic material from Derryvree produced the conventional radiocarbon determination BIRM-166 of 30,500 radiocarbon years BP, with an uncertainty of +1,170 and -1,030 years. Using modern calibration, this encompasses a broad span of roughly 36,900–31,700 calibrated years BP, or about 34,950–29,750 BCE. Thus 31,068 BCE lies within a possible range for the deposit, not at a demonstrable moment represented by a particular leaf, animal or pool.

This distinction matters because Ireland's Pleistocene record is fragmentary. Later glaciers repeatedly eroded, transported and buried older ground surfaces. A surviving bed may prove that conditions once existed at one locality, yet say little about another region at the same time. Dates on bones establish when

the animals died, rather than when a cave was occupied or a mark on a bone was made. The responsible history of this date is therefore one of probabilities, sequences and local environments rather than rulers, battles, diplomatic ties or named communities.

A Wetland Between Ice Advances

Derryvree is valuable precisely because it was sealed. Road excavations in 1969 cut through a drumlin, revealing silts, fine sands and organic-rich layers trapped between two thick tills: sediments left by separate glacier advances. Between those glacial deposits lay evidence for standing or slow-moving fresh water and surrounding wet ground. The lower till showed that ice had previously crossed the area; the upper till showed that ice later returned. In between, local ice had withdrawn far enough for a wetland system to form and persist long enough to accumulate sediment, plant remains and small animal traces.

The deposit does not depict a mild Irish countryside. Its plant and insect evidence indicates open tundra vegetation and a periglacial regime: a landscape strongly governed by frost, seasonal thaw, short growing seasons and little or no woodland. Mosses, sedges and aquatic plants grew in and around freshwater pools. Grasses, herbs and low shrubs occupied more freely drained ground. Pollen and macrofossils from northern Irish sites of broadly comparable cold-phase age support a sparse mosaic in which dwarf willow, mountain avens, juniper, heaths and arctic-alpine plants could find suitable niches. A few tree-pollen grains would not demonstrate a forest; pollen can travel long distances and may be reworked from older deposits.

Such a setting should not be pictured as uniformly white or lifeless. During a thaw season, waterlogged hollows could have carried mossy vegetation, sedge margins and shallow open water, while frost-shattered slopes and exposed mineral soils lay nearby. In winter the same terrain would have been harsher, with frozen ground, persistent snow in sheltered places and limited plant cover. The Derryvree evidence is direct proof of a local freshwater and tundra environment, but extending its exact detail to all Ireland remains interpretation. Uplands, western coasts and southern limestone country had different relief, drainage and exposure to Atlantic weather.

Ireland Before the Ice Maximum

At this point the British–Irish Ice Sheet was not yet at the later maximum that transformed much of Ireland. Modern reconstructions show that ice-sheet growth and retreat were asynchronous: separate sectors responded differently to climate, topography and the behaviour of neighbouring ice masses. Offshore records indicate ice rafting and an active polar-front environment during MIS 3, while Irish terrestrial sequences preserve episodes in which some land was ice-free. The broad Last Glacial Maximum came later, principally during the interval around 27,000–21,000 years ago, though the timing of individual margins remains debated. It would be wrong, then, either to portray the entire island as open ground in 31,068 BCE or to imagine it wholly entombed beneath a single continuous ice cover.

Sea level was lower globally because vast quantities of water were locked in continental ice sheets. The geography of the Irish Sea and the routes available to animals consequently differed greatly from today's. Yet lower sea level did not automatically provide a simple, dry land bridge across every channel. The connections between Ireland, Britain and the wider European landmass were shaped by marine basins, shifting ice margins, exposed shelves and, in some models, ice or discontinuous terrain rather than an easy overland corridor. For animals and any people, movement towards Ireland was an ecological and geographical problem, not a guaranteed march across a plain.

Reindeer, Hyaenas and Cave Evidence

Southern Irish caves provide an important, though complicated, complement to Fermanagh's wetland archive. Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork, yielded a remarkable Pleistocene faunal collection during excavations in the early twentieth century. Reindeer, giant deer, woolly mammoth, brown bear, fox, hare and spotted hyaena are among the animals represented in the wider cave assemblage. The National Museum of Ireland holds many of these fossils. Their presence shows that, at intervals during the Late Pleistocene, parts of Ireland supported or were reached by a varied cold-stage fauna, including both large herbivores and formidable scavenging predators.

That evidence must be handled carefully. Cave deposits can combine remains accumulated at different times by animals, water, collapse and human excavation. Improved radiocarbon pretreatment has shown that several older Irish cave dates required revision, and recent work has placed significant elements of the Castlepook fauna in MIS 3. It is reasonable to infer that open country and wetland resources could sustain herbivores, while caves offered denning or scavenging places for carnivores. It is not reasonable to assign every species found in the cave to 31,068 BCE, or to reconstruct a single, simultaneous herd moving across Cork on that notional date.

A reindeer femur from Castlepook has attracted particular attention because it has been dated to around 33,000 years ago and bears a surface mark interpreted by some researchers as a fresh-bone cut made with a sharp stone tool. If that interpretation withstands further taphonomic and archaeological scrutiny, it would point to an exceptionally early human visit to Ireland, perhaps by mobile Upper Palaeolithic hunter-gatherers. The claim remains much less secure than a settled occupation: there is no associated dwelling, hearth, tool assemblage, burial or stratified campsite of this age. A dated animal bone is direct evidence for the animal; the identification of a single mark as butchery is a separate, contested inference.

People: Possibility, Not Population History

There is therefore no basis for describing a resident Irish population, political territories, warfare, alliances, kin groups, languages or religious institutions in 31,068 BCE. Nor is there evidence for farming, trade networks, permanent villages, monuments, writing or formal learning. Agriculture lay tens of millennia in the future. If people entered Ireland during part of MIS 3, they would have belonged to highly mobile hunter-gatherer worlds known elsewhere in Upper Palaeolithic north-west Europe. Their practical knowledge would have concerned weather, animal behaviour, stone-working, fuel, shelter and movement through dangerous terrain. This is a contextual comparison, not proof of their presence at Derrynree or Castlepook in this particular year.

Even a brief human visit, if eventually confirmed, would have had no known political consequence in the ordinary historical sense. It would instead demonstrate that Ireland was not invariably beyond the reach of people during the last glacial cycle. Its larger importance would be geographical: a cold, intermittently habitable western edge of Europe where animal dispersal, changing sea levels and ice-sheet dynamics governed opportunity. The archaeological silence may partly reflect genuinely sparse visitation, but it also reflects destruction by later ice and the difficulty of finding deeply buried or submerged Pleistocene landscapes.

The Evidence That Endures

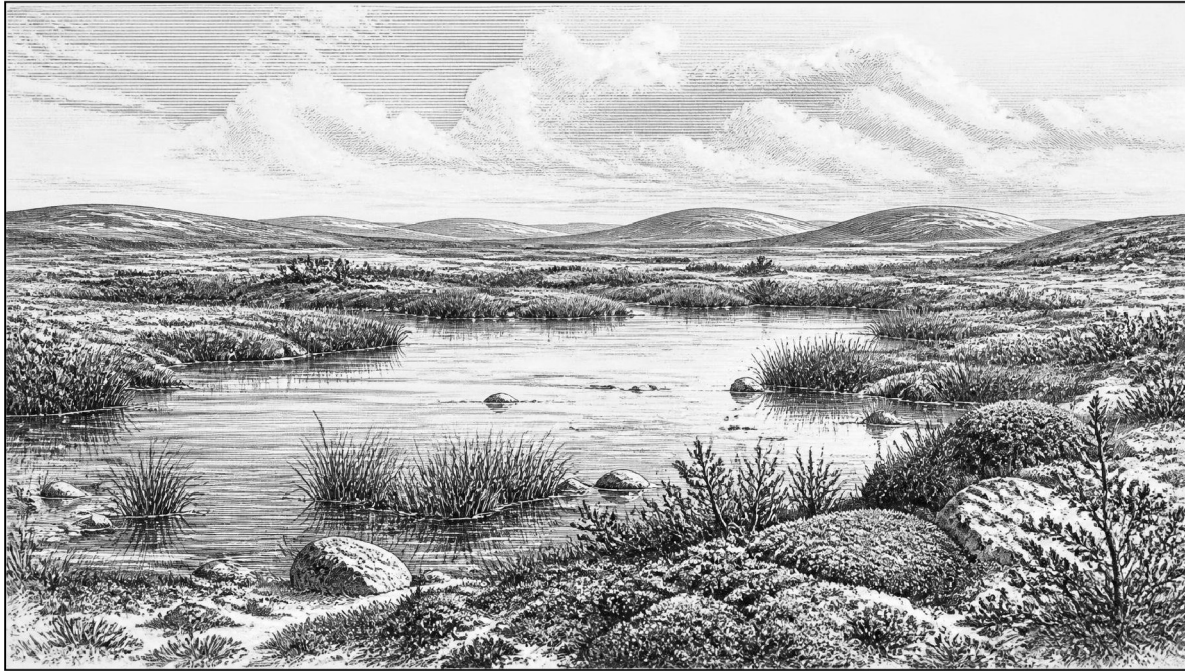
For Ireland around 31,068 BCE, Derryvree's sediments are more eloquent than any imagined human drama. They preserve a local episode when freshwater accumulated between glacial incursions, when mosses and sedges grew beside cold pools, and when insects and plants recorded an open periglacial world. Castlepook's bones add evidence that large mammals and predators reached southern Ireland during the wider MIS 3 interval. Together, these records establish neither a dated hunting party nor an island-wide climate map. They do, however, reveal an Ireland in motion: not yet at the height of the final ice advance, but already shaped by profound cold, unstable habitats and the recurrent advance of ice.

The year is consequently best understood as a point inside a broad scientific range. Its history is environmental and archaeological before it is human: water collecting in a Fermanagh hollow, tundra plants persisting through short summers, large mammals exploiting open ground, and future glaciers preparing to bury much of the evidence. That modest but remarkable archive is enough to replace blankness with a carefully bounded picture—one founded on what the deposits demonstrate, and candid about all that they cannot tell us.

Chapter 034 of 100

31067 BCE

Derryvree Intertill Sequence^[34]



“31,067 BCE” is a modern calendar label, not a year for which Ireland preserves an event, a ruler, a settlement diary or even a season-specific archaeological horizon. There is no year-zero in the BCE/CE system, and the label corresponds roughly to 33,016 calendar years before AD 1950. At that depth of time, responsible dating is expressed in ranges. The most useful Irish evidence places this notional year within the Late Pleistocene, in Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. What can be written is therefore an account of an interval and its evidence, not an annual chronicle.

A Date Within a Broad Range

The closest and most revealing Irish archive is Derryvree townland, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed an exceptional sequence: freshwater silts and fine sands, including organic material, trapped between two thick deposits of glacial till. The order of those layers is fundamental. An earlier glacier had laid down the lower till; afterwards, at least locally, ice-free conditions allowed water, sediment, plants and insects to accumulate; then a later glacial advance buried the wetland beneath a second till sheet.

Organic material from the Derryvree deposit returned a conventional radiocarbon determination of 30,500 years BP, with a substantial uncertainty of +1,170 and –1,030 years. Radiocarbon years are not calendar years. Atmospheric carbon-14 has varied through time, so results must be calibrated against independently dated records. Later work places the Derryvree evidence broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. The date 31,067 BCE falls inside that span, but it cannot be attached to a particular plant, animal, pool or human action in the sediment. It is best understood as a point within a long environmental window.

Fresh Water Between Glacial Episodes

Derryvree matters because it shows that south Fermanagh was not continuously smothered by glacier ice during this part of the last glacial cycle. It does not demonstrate that the whole island was ice-free at the same moment. Ireland's ice cover was dynamic, with regional advances and retreats shaped by terrain, snowfall, temperature, sea level and the interaction of Irish and British ice masses. The freshwater deposit instead records a local landscape that existed between episodes of glaciation and was subsequently sealed from view by the returning ice.

The plant and animal remains recovered from the silts point to open tundra and a severe periglacial regime. Periglacial does not mean a simple, lifeless frozen desert. It describes ground and ecosystems affected by intense cold, seasonal thaw and frost action beyond the immediate edge of ice. The Derryvree assemblage indicates wet ground, moss-rich vegetation, sedges and shallow water in an otherwise treeless country. Plants associated with the deposit include aquatic and wetland species, while the wider assemblage suggests an intricate patchwork of open pools, marshy ground and sparsely vegetated surfaces. Summer thaw could create biologically productive pockets even where winters were long and harsh.

This was not the familiar green Ireland of later prehistory, nor a landscape of oak woods, fields or permanent villages. Woodland of the later Holocene kind had no place in the evidence from Derryvree. Instead, the country around the freshwater basin was likely exposed, wind-swept and variable at short distances: wet hollows beside drier mineral ground, stretches of moss and sedge beside bare or thinly vegetated surfaces, and perhaps sheltered sites where snow lingered. Such habitat diversity helps explain how cold-adapted plants, insects and grazing animals could use parts of an otherwise demanding landscape.

Animals and the Cave Record

County Cork provides a second, different kind of evidence. Castlepook Cave, also called Mammoth Cave or Doneraile Cave, lies in limestone country near Doneraile. It is Ireland's richest known repository of vertebrate remains from the period leading up to the Last Glacial Maximum. More than 2,000 bones have been recovered there, representing a long and complicated accumulation rather than one occupation episode. The cave's Ice Age fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later material includes lemmings, Arctic fox and wolf.

These remains demonstrate that Ireland, or at least accessible parts of it over the wider period, could support a striking cold-climate fauna. Yet the cave should not be treated as a photograph of 31,067 BCE. Bones from different millennia accumulated in different chambers and circumstances. Water movement disturbed deposits, while spotted hyaenas may themselves have transported or modified carcasses. Castlepook is decisive evidence for the presence of particular animals across a long interval, but it cannot show that mammoths, hyaenas, reindeer and people all met in the cave on one occasion. Taphonomy—the study of what happened to remains between death, burial and excavation—is central to reading the site honestly.

Reindeer are especially important to the history of this date because a femur fragment from Castlepook has been reported as bearing marks consistent with cutting by a stone tool and has been dated to roughly 33,000 years ago. If the marks are confirmed as anthropogenic, the bone would suggest that people processed a reindeer carcass in Ireland in the broad period relevant here. It would be an extraordinary discovery. But the find comes from an old cave collection rather than a newly excavated,

securely associated occupation floor. It is not accompanied by an unequivocal hearth, dwelling, stone-tool assemblage or cemetery. The proper conclusion remains careful: possible human activity, not proof of a settled population.

The Human Question

There is no securely dated settlement in Ireland from around 31,067 BCE. No house plan, hearth, rubbish pit, burial, workshop, harbour or durable route can be assigned to this calendar label. Nor is there evidence for an Irish population continuous from this time into later prehistory. The subsequently advancing Irish Ice Sheet would have eroded, displaced and buried much of the earlier landscape; later sea-level rise also drowned former coastal terrain where evidence of short-lived visits might once have survived. These processes help explain the poverty of the record, but they cannot turn absence into proof of occupation.

Across north-west Europe, *Homo sapiens* communities were making Upper Palaeolithic technologies, hunting and gathering in environments shaped by sharp climatic change. Ireland lay at the far Atlantic margin of that wider world. Lower sea levels altered the geography of the surrounding seas and may have changed routes of access, but they did not automatically create a simple, dependable land bridge or establish that people crossed it. If people reached Ireland in this period, the available evidence is more compatible with small, mobile groups making brief, opportunistic incursions than with year-round communities. That is an interpretation from the scarcity and character of the finds, not a directly observed social fact.

No Politics, No Proven Diplomacy

Political affairs cannot responsibly be reconstructed for Ireland at this time. There are no named peoples, chiefs, territories, laws, alliances or conflicts in the evidence. Even the existence of a local human group remains unproven. It would be misleading to describe mammoth hunting as warfare, animal movement as trade, or crossings of the sea as diplomacy. The scale of the evidence does permit one modest inference: any people who did enter such a cold and uncertain landscape would have required extensive practical knowledge of weather, animal behaviour, tool maintenance, clothing and movement. That is a general inference from comparable Upper Palaeolithic lifeways, not knowledge of a particular Irish community.

The same restraint is necessary for religion, culture and learning. No art, ornament, musical instrument, grave, shrine or symbolic object from Ireland can be dated to around 31,067 BCE. The potential cut-marked reindeer bone concerns carcass processing, not belief. Nor can language, kinship, gender roles or ritual be recovered from Derryvree's plants and insects. Their absence from this article is not a gap to be filled with imaginative reconstruction; it is the principal fact about the surviving Irish record.

Economy Without a Market

There is likewise no evidence for farming, herding, metalworking, exchange networks or permanent trade at this point. If humans were present, their subsistence would most plausibly have depended on foraging, hunting and scavenging within a highly seasonal environment, perhaps including the use of reindeer and other large animals where opportunity allowed. But no excavated Irish assemblage identifies

their food range, hunting methods, tool kit or seasonal round. The strongest economic story is ecological rather than commercial: wetland plants and insects occupied a short-lived refuge; herbivores moved through available habitats; predators and scavengers followed animal resources; and ice later transformed the setting.

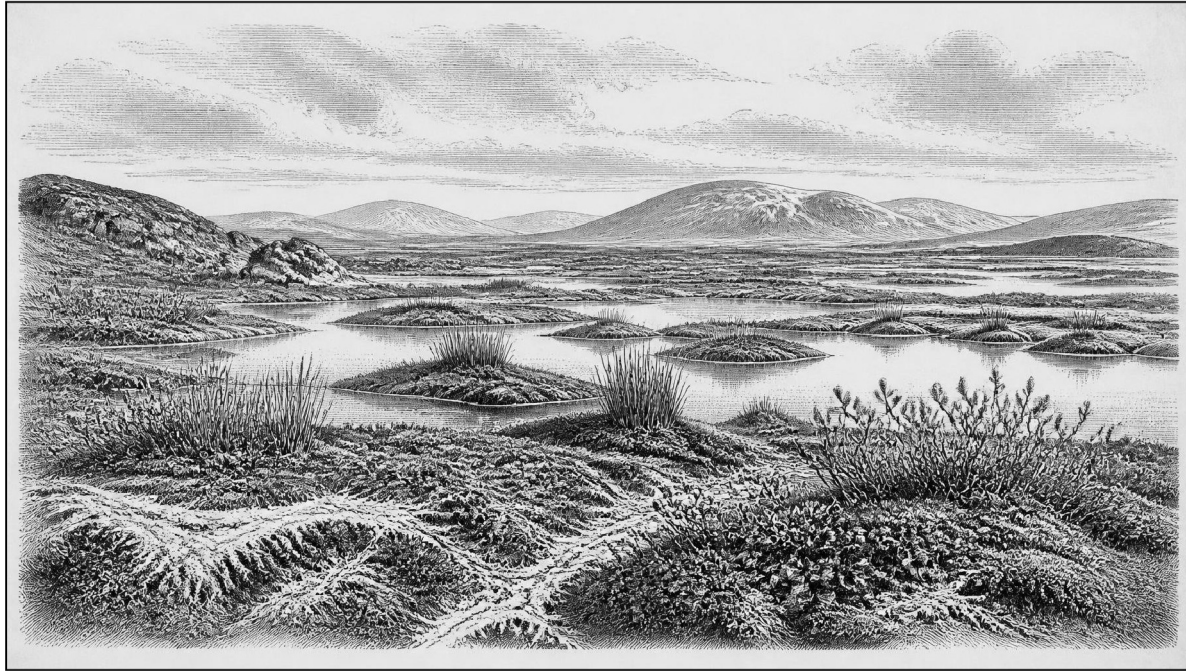
Regional change gives that story its force. In Fermanagh, Derryvree records freshwater conditions in a drumlin landscape. In Cork, Castlepook preserves a cave archive of animal bones accumulated over tens of thousands of years. Offshore and western Irish evidence shows that ice margins could fluctuate markedly before the formal Last Glacial Maximum, which reached its greatest extent later. Ireland around this date was not a uniform white blank, but neither was it a stable habitable island. It was a changing mosaic whose best records survive in exceptional sediment traps and caves.

The most important development around 31,067 BCE was therefore neither a battle nor a dynasty, but the precarious existence of an open, wet tundra landscape before renewed glaciation. Derryvree's silts preserve a rare interval when freshwater life persisted between two episodes of ice. Castlepook's bones show that large Ice Age mammals belonged to the island's wider ecological history and raise, without yet settling, the possibility of a human encounter with that world. The evidence is fragmentary, but it is enough to replace the idea of an empty prehistoric void with a more accurate one: an Ireland of cold water, tundra vegetation, mobile animals, uncertain human presence and deep chronological caution.

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31066 BCE

The Maguiresbridge Interlude^[35]



31,066 BCE is a modern chronological label, not a year that can be recovered from Ireland's prehistoric record. In archaeological terms it falls about 33,016 calibrated years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. No Irish calendar, writing, named people or datable historical event survives from this depth of time. The responsible subject is therefore not an anniversary but an interval: the cold, changing world that archaeological and environmental evidence can illuminate around this point.

The closest major Irish archive is at Derryvree, near Maguiresbridge in County Fermanagh. Its evidence is broad enough to be relevant, but not precise enough to identify conditions in a particular season, generation or year. Elsewhere, caves in Cork preserve animal remains from related phases of the Late Pleistocene. Together, these records show that Ireland was neither a familiar green island nor an unbroken, permanent ice sheet. It was a north-western European landmass undergoing rapid environmental change, where the availability of water, vegetation, animal routes and ice-free ground varied sharply across place and time.

A Date Within a Range

Road works in 1969 cut through a drumlin at Derryvree and exposed an exceptional sequence: freshwater silts and fine sands, including organic material, trapped between two deposits of till. Till is sediment laid down directly by glacier ice. The sequence establishes a secure relative order. Ice had earlier occupied the locality and formed the lower till; a period without overriding local ice then allowed water, plants and sediment to accumulate; later glacial activity buried the deposit beneath a second till.

Organic material from the freshwater deposit, BIRM-166, produced a conventional radiocarbon determination of 30,500 years BP, with a large uncertainty of +1,170 and -1,030 years. Calibration is necessary because atmospheric carbon-14 has varied through time. Published treatments place the result broadly in the middle-to-late 30,000s calibrated years BP, approximately 36,900–31,700 cal BP. The modern date 31,066 BCE, equivalent to about 33,016 cal BP, lies within that wide range. It does not date a specific layer, plant or occurrence at Derryvree.

This limitation matters. A radiocarbon determination dates carbon in sampled material, while the organic bed accumulated over time in a changing wetland. The calibrated range is also wide because radiocarbon uncertainty increases so far back in time. Derryvree is consequently compelling evidence for a cold, ice-free interval at that locality, not proof that all Ireland looked identical in 31,066 BCE. It is a local archive with national importance precisely because comparable Irish evidence is so rare.

Waterlogged Tundra in Fermanagh

The Derryvree plants and animals indicate a treeless, periglacial landscape. Pollen was poorly preserved, but plant macrofossils, mosses and insect evidence recorded a wet, open environment. Sedges, mosses, dwarf shrubs and cold-adapted herbaceous plants belonged to a tundra-like mosaic rather than woodland. Bogbean and water-milfoil show that standing or slow-moving freshwater existed, while mountain-avens, dwarf willow and other cold-climate indicators point to exposed ground beyond the pools. The term *muskeg*, used by researchers for such waterlogged, peaty tundra terrain, is more useful than imagining either a modern Irish bog or a lifeless polar desert.

This was an environment of contrasts. Summer thaw could sustain shallow pools, damp ground and brief plant growth, but frost, snow cover, frozen soils and strong seasonal shifts constrained life. Sparse vegetation in drier places would have left soils vulnerable to wind and frost disturbance. Watercourses and wetlands would have been vital ecological corridors, concentrating plants, insects and visiting animals. These are reasonable inferences from the deposits; they should not be mistaken for evidence of a settlement beside a particular Derryvree pool.

At the Edge of Expanding Ice

The wider setting was one of climatic volatility. Speleothems from Crag Cave in County Kerry demonstrate that liquid water periodically moved through shallow cave systems during MIS 3. Because calcite deposition requires unfrozen water and conditions generally above the freezing threshold in the cave's catchment, episodes of stalagmite growth register milder intervals. Their uranium-thorium dates show that these ameliorations alternated with colder phases, rather than producing a simple, steady descent into the Last Glacial Maximum.

At roughly this horizon, however, the direction of long-term change was towards more extensive ice. Reconstructions of the British–Irish Ice Sheet indicate rapid ice growth in the northern British Isles around 32,000–31,000 years ago and later expansion around Ireland. The greatest extent of the Irish and British sectors came later, principally around 30,000–26,000 years ago, with the overall ice-sheet maximum volume later still. Those reconstructions are increasingly detailed, but their authors stress that early growth is less securely dated than retreat. Around 31,066 BCE, it is therefore safer to describe Ireland as a region of unevenly advancing glacial conditions than to portray the whole island as already buried beneath a single uniform ice mass.

Lower global sea level altered the geography beyond Ireland's present shores. Much of the continental shelf was exposed or lay beneath shallower seas, and movement between Ireland, Britain and continental Europe was more feasible for animals than it would later become. This does not establish a simple dry land bridge at every moment or every route. Ice, sea, estuaries and changing coastlines created barriers as well as corridors. The important point is that Ireland was part of a connected, though difficult and fluctuating, north-west European ecological zone.

Reindeer, Hyenas and Fragmentary Faunas

Castlepook Cave, also called Mammoth Cave, near Doneraile in County Cork provides the richest Irish collection of vertebrate remains from the period leading towards the Last Glacial Maximum. Its assemblage includes reindeer, woolly mammoth, giant deer, brown bear and spotted hyena, alongside smaller cold-adapted mammals in the wider cave record. The National Museum of Ireland and Geological Survey Ireland rightly treat the cave as central to understanding Ice Age fauna in Ireland.

Yet the cave should not be read as a census of animals alive together in one year. Much material was excavated in the early twentieth century, often from deposits whose stratigraphy had already been disturbed or was inadequately recorded. Individual bones can be directly dated, but the assemblage accumulated through numerous episodes: animals dying naturally, carnivores using cavities, water moving material, and later excavation. The evidence demonstrates that large herbivores and formidable predators reached Ireland during parts of the Late Pleistocene. It cannot reconstruct one intact herd, hunting ground or food chain for 31,066 BCE.

Even so, the combined Fermanagh and Cork records support a compelling broad picture. Open, cold landscapes could sustain grazing and browsing mammals, while predators followed or scavenged them. Reindeer in particular suit seasonally open country and are important indicators of northern connections. Spotted hyena remains show that Late Pleistocene Ireland was not simply an Arctic scene in the modern sense: the fauna belonged to a distinctive European cold-stage world, assembled under combinations of climate, habitat and access that no longer exist on the island.

No Political Ireland

There is no responsible basis for describing political affairs, diplomacy, rulers, tribal territories, warfare, religion or formal learning in Ireland at this date. Nor is there a securely dated Irish house, hearth, tool assemblage, burial or settlement that can be assigned to this interval. The earliest published direct evidence for human activity in Ireland remains far later: a cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to about 12,810–12,590 cal BP. That find cannot be projected backwards by twenty millennia.

People elsewhere in Upper Palaeolithic Europe possessed sophisticated stone technologies, social networks and symbolic cultures. It is plausible that any human group entering an Irish landscape during a temporary accessible phase would have required detailed knowledge of animal behaviour, fuel, shelter, weather and routes. But plausibility is not evidence. Ireland's record around 33,000 cal BP provides no artefacts from which to identify a local technology, no bones from which to recover a population, and no material culture from which to infer ritual. The most honest conclusion is that human presence remains unproven for this particular Irish interval.

Economy Without Farmers or Markets

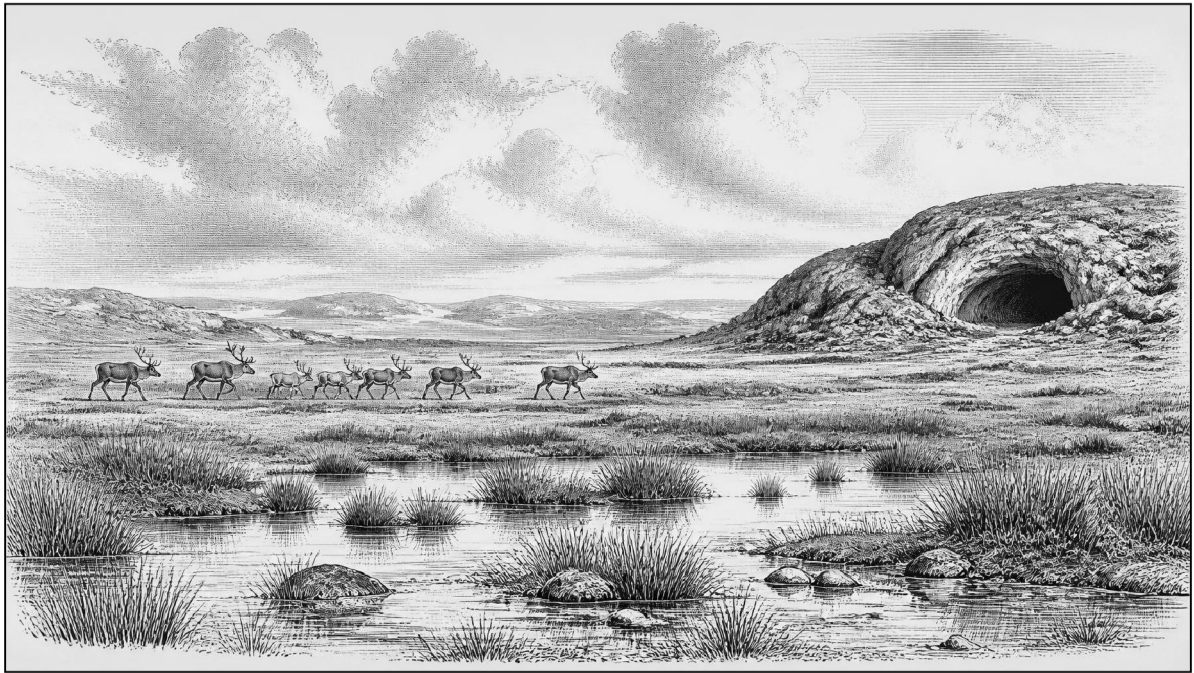
There was no agricultural economy, no permanent village system and no evidence for trade in the historical sense. If people ever visited, their subsistence would have depended upon mobile hunting and gathering, but that remains an inference rather than a documented Irish practice. The demonstrable economy was ecological: plants turned a short growing season into fodder; herbivores converted it into moving biomass; carnivores and scavengers exploited that abundance; and wetlands offered fresh water and concentrated resources.

The most important development around this notional year was environmental. Derryvree preserves an interval in which freshwater and tundra vegetation existed between glacial episodes. Crag Cave records rapid climatic oscillation. Castlepook shows that Ireland's Late Pleistocene fauna was richer, and more continental in character, than its later historic fauna. Subsequent ice advance erased, displaced or buried vast amounts of evidence. What remains is incomplete, but it is enough to reveal an Ireland shaped not by kingdoms or chronicles, but by thawwater, tundra, animal movement and approaching ice.

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31065 BCE

Awbeg's Cold Steppe^[36]



“31,065 BCE” is a modern chronological convenience, not a date that anyone then living in Ireland could have recognised, and the evidence cannot resolve events to a single calendar year. In calibrated terms, it corresponds approximately to 33,000 years before present. Ireland at this point belongs to Marine Isotope Stage 3, a long, climatically unstable part of the Late Pleistocene preceding the fullest expansion of the last Irish Ice Sheet. The responsible historical question is therefore not what happened in a particular year, but what the surviving sediments, animal remains and landforms allow us to say about Ireland in the broad interval around it.

Before the Last Ice Sheet

At about 33,000 calibrated years ago, Ireland was approaching a decisive environmental transformation. The island was not yet buried beneath the ice that would later shape much of its modern surface. Research on glacial chronology indicates that substantial areas remained ice-free until roughly 34,000 years ago, while the maximum extent of the last Irish Ice Sheet belongs later, broadly to about 27,000–23,000 calibrated years before present. This was not a settled, stable prelude. Climate in the North Atlantic changed sharply and repeatedly; ice expanded and retreated across the wider region, while the precise timing and local extent of ice in Ireland remain matters of active reconstruction.

A key Irish record comes from Derryvree in County Fermanagh. There, organic, moss-rich mud lay between separate glacial deposits. A conventional radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years before present has been calibrated to a broad range of roughly 36,900–31,700 calendar years before present. That range overlaps the modern label 31,065 BCE, but it does not date a moment, a settlement or the whole island. It shows that, before renewed ice covered the deposit, waterlogged ground and vegetation existed in this part of northern Ireland during a cold phase of the last glaciation.

Wet Ground and Open Country

The Derryvree sediments preserve plant remains rather than a picturesque landscape. Their value lies precisely in that modesty. They point to a treeless muskeg or wet tundra environment: sedges, mosses and cold-adapted plants around shallow water and saturated ground, rather than forest. Such evidence should not be converted into a uniform national weather report. Local wetland conditions in Fermanagh cannot tell us exactly what a valley in Cork, the western uplands or an exposed eastern coast looked like on the same day. They do, however, fit a wider picture of an open, cold, largely treeless Ireland, with sheltered wet places amid extensive periglacial terrain.

Sea level was much lower than it is today because large quantities of water were held in northern ice sheets. Ireland's coastline consequently stood farther offshore, and the land available to plants and animals was larger than the present island. Yet lower sea level did not automatically mean a dependable land bridge to Britain or continental Europe. The changing Irish Sea basin, ice margins and coastlines make routes of movement difficult to reconstruct. Animals certainly reached Ireland during the Pleistocene, but the mechanism, timing and frequency of particular migrations cannot simply be read back from a modern map.

Castlepook's Animal World

The richest glimpse of southern Ireland near this broad horizon comes from Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, close to the Awbeg and Blackwater river systems. Excavations undertaken between 1904 and 1913 recovered a remarkable mixture of bones from cave deposits. Later study and redating have made the site central to discussion of Ireland's pre-Last Glacial Maximum fauna, while also stressing a major limitation: the deposits were disturbed, accumulated over a long time and do not provide a single neatly sealed occupation surface.

Even so, the securely identified animal spectrum is striking. It includes reindeer, woolly mammoth, giant deer, wolf, red fox, Arctic fox, brown bear, spotted hyaena and lemmings. This was an ecosystem unlike that of historic Ireland. Reindeer and lemmings indicate cold, open habitats; mammoth and giant deer imply substantial grazing country; wolves and hyaenas reveal a formidable predator and scavenger guild. A cave may have been a den, a trap, a refuge, a place into which water and sediment moved bone, or a combination of all these. Its assemblage therefore records animals using a landscape, not a census of creatures living simultaneously beside the entrance.

The more secure interpretation is nevertheless important: Ireland supported a diverse Pleistocene fauna during parts of Marine Isotope Stage 3. It was not an empty icebound land at all times before the Last Glacial Maximum. Food webs extended from tundra plants and grazing herbivores to large carnivores. Seasonal movement is plausible for some animals, especially reindeer, but the cave evidence does not reveal exact migration routes, herd sizes or seasons of use. Nor can it establish which species were present in every Irish region at about 33,000 years ago.

The Human Question

Castlepook has also generated the most provocative claim for this period: a reindeer femur carries a deep mark interpreted by zooarchaeologist Ruth Carden as consistent with cutting by a sharp stone tool during carcass processing. Public presentation of the object has associated it with roughly 33,000 years ago. If the mark was made by people on fresh bone and belongs with the animal's date, it may represent

an exceptionally early indication of human activity in Ireland. It would suggest a brief visit or episode of butchery by Upper Palaeolithic hunter-gatherers long before the better evidenced post-glacial human presence.

But that conditional language matters. A dated animal bone does not by itself date the making of a surface mark; identifying a cut mark requires taphonomic judgement; and an isolated modified bone is not a settlement. Castlepook has not yielded a securely stratified contemporary hearth, stone-tool assemblage, dwelling, burial or repeated occupation surface. Nor does it show whether people hunted the reindeer, found a carcass, removed meat or sinew, or merely passed through the area. The evidence permits the possibility of human presence, not a confident narrative of a resident population.

No Kingdoms, No Recorded Communities

For this reason, political history cannot responsibly be written for Ireland in 31,065 BCE. There is no evidence for kingdoms, territories, chiefs, diplomacy, warfare between human groups, law or named communities. There are no inscriptions, monuments, houses or material assemblages from which to reconstruct an Irish society. Even the term “Ireland” is geographical shorthand: it refers to the landmass in the position of the modern island, not to a people, state or cultural identity that existed then.

The same restraint applies to everyday life. If small groups of people reached the island, their survival would have depended on mobility, close knowledge of animal behaviour, protection from cold and wet, fire, clothing and reliable stone technology. Those are reasonable inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not observations from an excavated Irish camp. We cannot identify their language, kinship arrangements, seasonal round, food-sharing customs or relations with groups across the sea. The Castlepook bone, if anthropogenic, offers a trace of action rather than a biography of its maker.

Culture Beyond Recovery

There is likewise no direct Irish evidence from this date for ritual, formal religion, art, music, teaching or trade. Caves can acquire symbolic importance in later societies, but Castlepook’s Pleistocene bone deposits do not demonstrate ceremony. Reindeer antler, hide, meat, marrow and sinew were valuable materials for hunter-gatherers elsewhere, yet no Irish evidence identifies their use here. Trade is even less visible: no imported stone tools, ornaments or exchange goods can be assigned securely to this horizon.

What can be said is that the landscape itself imposed a common ecological framework. Open ground favoured grazing animals; wetlands supported specialised plants; caves created focal points for carnivores and accumulated remains that later researchers could study. Repeated climatic deterioration was the larger historical force. Over the following millennia the last Irish Ice Sheet expanded, eroding, burying and rearranging much of the earlier landscape. That process helps explain why the pre-maximum archaeological record is so slight: possible camps, surfaces and artefact scatters were vulnerable both to ice and to subsequent coastal change.

A Narrow Window

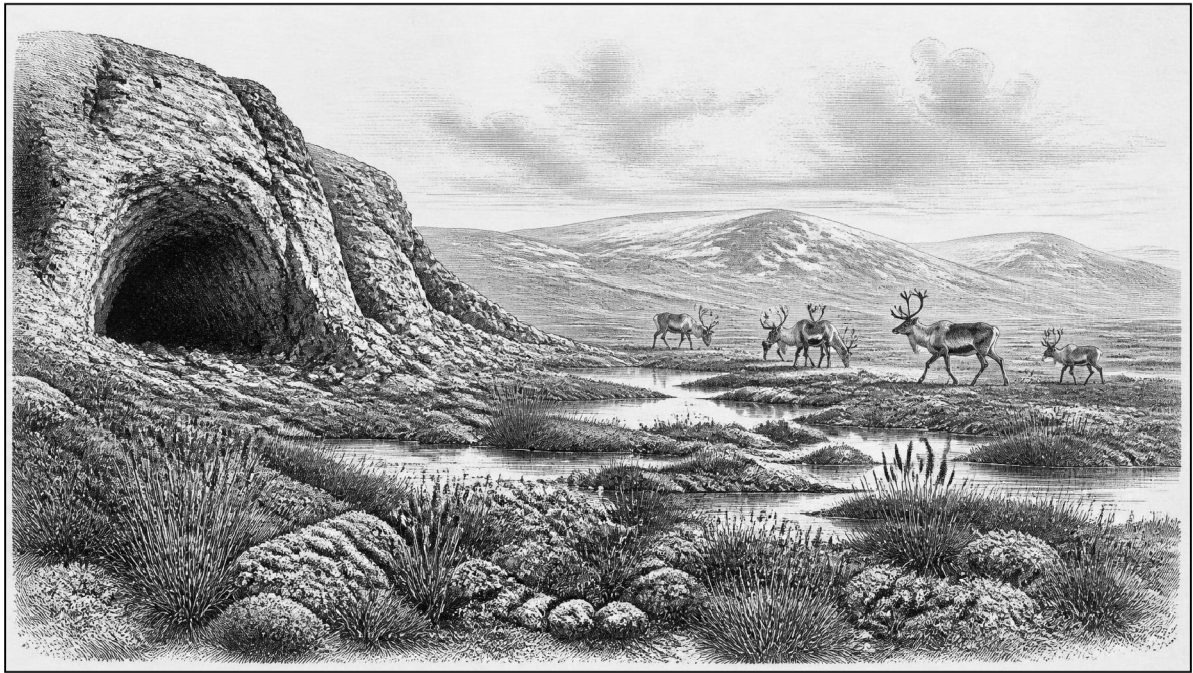
Ireland around 31,065 BCE is therefore best understood as a narrow evidential window between earlier and later ice advances. Derryvree preserves a northern wetland interval; Castlepook preserves a southern cave fauna of cold-country herbivores and predators; glacial research establishes that the island’s

complete ice cover lay ahead, not yet fully realised. The possible cut-marked reindeer femur adds a compelling human question, but not a settled answer. At this depth of time, the most meaningful history is one of environments, animals and geological change, with the prospect—still unproven in full—of fleeting human presence at Europe's Atlantic edge.

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31064 BCE

Doneraile's Marked Femur^[37]



31,064 BCE is a modern chronological label, not a year from which Ireland has a written record, a named community or a datable event. It falls roughly 33,000 calendar years before present, where “present” in archaeological dating means AD 1950. At such depth in time, calendar-year precision is not available. Radiocarbon measurements require calibration, have uncertainties, and date particular organic remains rather than a whole landscape or episode of human activity. The most responsible account of Ireland at this point therefore uses broad, calibrated ranges and separates securely observed evidence from more ambitious interpretation.

In archaeological terms, this was the later part of the Upper Palaeolithic and Marine Isotope Stage 3, several millennia before the fullest expansion of the Last Glacial Maximum. Ireland was entering a severe phase of the last Ice Age, but it should not be imagined as a single, unchanging white wilderness. The island's climate, ice cover, exposed ground, wetlands and animal populations altered repeatedly over long timescales. The evidence closest to this notional date comes from fossil deposits and cave faunas, above all at Derryvree near Maguiresbridge in County Fermanagh and Castlepook Cave near Doneraile in north County Cork.

A Date Without a Chronicle

The apparent exactness of “31,064 BCE” can mislead. It does not identify a day, season or even a historically meaningful year in prehistoric Ireland. It is best treated as a point within a wide interval, approximately the thirty-third millennium before AD 1950. The relevant evidence is often expressed in conventional radiocarbon years BP, which are not identical to calendar years, or in calibrated ranges

extending across centuries or longer. The IntCal20 calibration framework, used for Northern Hemisphere radiocarbon dating, makes this distinction especially important for the late Pleistocene, when atmospheric radiocarbon varied considerably.

Nor was there an “Ireland” in the political or cultural sense familiar from later history. There were no known kingdoms, borders, rulers, languages, monuments, farms or written traditions. The island’s present political jurisdictions and county names are used here only to locate evidence. Questions normally asked of a year-by-year history—diplomacy, warfare, government, taxation, trade and religion—cannot be answered directly for this period. Their absence from the record is itself significant: the material evidence does not demonstrate a resident human society capable of producing such institutions.

Derryvree’s Cold Wetland

One of Ireland’s most important environmental archives was exposed during road works in 1969 at Derryvree, two kilometres north-east of Maguiresbridge. Excavation cut through a drumlin and revealed freshwater silts and fine sands enclosed between two thick layers of glacial till. The organic deposit produced a conventional radiocarbon determination of $30,500 \pm 1,170/1,030$ BP. That result belongs to a broad and uncertain span when converted to calendar time, but it makes Derryvree highly relevant to the world around 31,064 BCE rather than evidence for that exact year.

Its fossil content records a treeless, cold-stage environment. Pollen, plant macrofossils, mosses and insect remains point to open tundra or muskeg: wet ground with pools, sedges, grasses and hardy herbs, rather than woodland. Mountain avens, dwarf willow, juniper, Arctic clubmoss, bogbean and water-milfoil are among the plants identified or inferred from the sequence. These do not reconstruct a neat, uniform national landscape. They describe conditions around one Fermanagh basin, and some pollen may have travelled farther than locally growing plants. Yet together they show that parts of Ireland could support freshwater habitats and specialised cold-adapted vegetation amid a generally harsh, exposed setting.

The Derryvree deposits also reveal environmental instability. Their position between tills means that a wetland existed during an interval between glacial advances, then was overridden or sealed by later ice-related sediment. The landscape was consequently not static. Seasonally frozen ground, sparse vegetation, shallow water and wind-blown mineral sediment may have alternated with wetter, more productive patches. Such ecological mosaics mattered to animals and any passing people alike: food and shelter would have been concentrated, seasonal and vulnerable to climatic deterioration.

Castlepook and the Reindeer

Far to the south-west, Castlepook Cave—also called Mammoth Cave—near Doneraile preserves a very different kind of evidence. Antiquarian excavations conducted principally between 1904 and 1912 recovered bones of a cold-stage fauna, including woolly mammoth, reindeer and spotted hyaena. Subsequent work by the Irish Quaternary Fauna Project subjected parts of this legacy collection to modern radiocarbon study. Dates from the cave place some animal remains broadly in the period before the Last Glacial Maximum, while also underlining a major limitation: old excavations did not record sediments, bone positions and associations to standards expected today.

The most arresting object is a reindeer femur held by the National Museum of Ireland – Natural History. Ruth Carden has interpreted a deep surface incision as a mark made by a sharp stone implement during the processing of fresh bone. County Cork’s heritage publication accordingly presents the object as

Palaeolithic and approximately 31,000 BC. If that diagnosis is upheld, it may be Ireland's earliest claimed indication of human handling of an animal, vastly earlier than the better-established terminal-Pleistocene evidence from County Clare.

That conclusion must remain carefully qualified. The dated age of a bone is not necessarily the moment at which its mark was made; a marked bone is not a campsite; and a cave containing animal remains is not automatically a human dwelling. Castlepook has not produced a securely associated stone-tool assemblage, hearth, floor, shelter structure, burial or repeated concentration of butchered carcasses that would establish a settled population. Carnivores could move bones into caves, scavenging and gnawing could alter them, and natural processes could disturb deposits. The femur is therefore evidence of a possible human action, not proof that a community lived in Ireland in 31,064 BCE.

Animals, Ice and Opportunity

Even with these cautions, Castlepook and Derryvree illuminate a plausible Irish environment of open country, wet hollows and large grazing animals. Reindeer were suited to cold, relatively open landscapes; mammoth remains point to a wider late-Pleistocene fauna with affinities beyond Ireland. Spotted hyaena remains are equally important. They indicate that caves could be part of a carnivore landscape, places used as dens or repositories of transported prey rather than passive vaults preserving an undisturbed scene. Wolves, bears and other animals may also have ranged through changing habitats, though the surviving cave record is selective and cannot yield a complete census.

Ice-sheet reconstruction adds the larger geographical setting. The British–Irish Ice Sheet was growing through this broad period, but its extent and timing varied by sector and remain topics of active research. A recent BRITICE-CHRONO synthesis places important ice growth around 30,000 calibrated years BP, with the full glacial maximum later, around 27,000–24,000 years ago in many reconstructions. Thus Ireland around the date represented here was approaching, rather than simply sitting at, the maximum ice-covered phase. It is unsafe to state that every district was under ice, or that a particular coast lay at a known distance from the sea, without a site-specific reconstruction.

Lower global sea level changed the outlines of the continental shelf, but it does not licence an easy story of a dry, continuous route for humans into Ireland. The relationship between Ireland, Britain, the Irish Sea basin and ice margins changed through time. Whether a usable land connection existed at any particular moment is a separate geological question from whether people were present. The Castlepook femur, if genuinely humanly modified, would show only that people reached an animal carcass in Ireland or travelled through the region; it cannot settle the route, season, group size or frequency of movement.

What Cannot Be Recovered

There is no responsible evidence for political affairs or conflict in Ireland at this date. Nor can religion, language, kinship rules, artistic practice or teaching be reconstructed from the Irish record. No portable art, personal ornament, human remains, habitation surface or worked lithic assemblage has been securely tied to this period. It would be tempting to infer a reindeer-hunting culture from north-west European Upper Palaeolithic comparisons, but that would be analogy rather than Irish evidence. If humans did process the Castlepook animal, they may have belonged to a highly mobile hunting party; they may have made a brief visit; or the apparent tool mark may require further reassessment. None of these possibilities amounts to a known population.

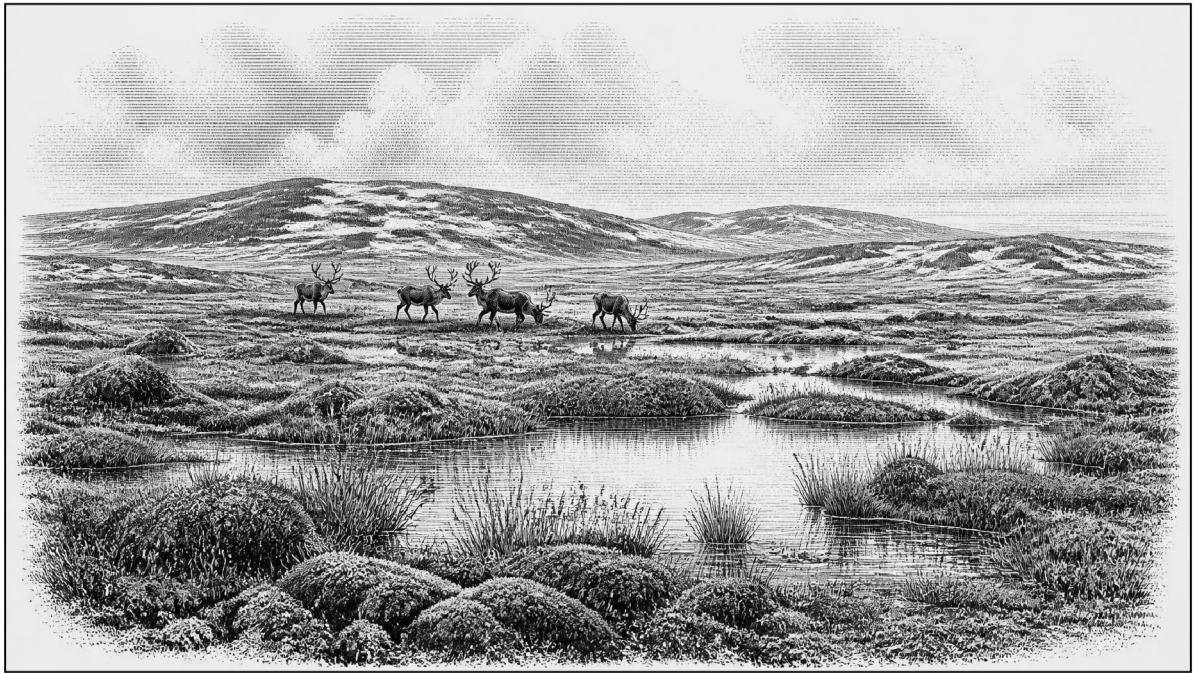
Likewise, there is no demonstrated local economy in the usual sense: no agriculture, herding, craft production, exchange network or long-distance trade can be traced in Ireland around 31,064 BCE. At most, a cut-marked reindeer bone would suggest immediate subsistence activity—carcass processing—rather than a permanent economic system. Derryvree’s plants and insects reveal habitats that could sustain animal life, but they do not tell us who used them. Settlement is therefore best described as unproven, not empty by definition. Archaeological visibility is poor, later glaciation destroyed or buried many surfaces, and early investigations left imperfect records.

The central historical development was environmental rather than political: Ireland was a cold, changeable late-Pleistocene land moving towards extensive glaciation. Fermanagh’s silts preserve a small freshwater tundra world, while Cork’s cave bones preserve evidence of reindeer, mammoth and carnivores—and a single, consequential possible human incision. Together they offer a disciplined glimpse of an island without chronicles: not a year of recorded events, but a landscape whose sediments and bones still set the limits of what can honestly be said.

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31063 BCE

The Last Drips at Crag Cave^[38]



31,063 BCE is not a date at which Ireland can be assigned a known event. It is a modern calendar label placed deep within the Late Pleistocene, roughly 33,000 calendar years before 1950. No written record, named individual, settlement sequence or annually resolved archaeological layer allows historians to say what happened in Ireland in that particular year. The responsible approach is therefore to use wider, calibrated ranges and to distinguish physical evidence from the interpretations built upon it. Around this point Ireland belonged to Marine Isotope Stage 3, a long, climatically unstable portion of the last glacial cycle, when cold phases alternated with comparatively milder interstadials and the British–Irish Ice Sheet was developing unevenly across the region.

A Date Without a Chronicle

The apparent precision of “31,063 BCE” can mislead. Radiocarbon laboratories report ages in radiocarbon years before present, conventionally before 1950, rather than direct calendar years. Because atmospheric carbon-14 levels changed over time, those measurements must be calibrated, and the resulting calendar estimates are ranges with considerable uncertainty at this depth in time. The modern IntCal20 curve reaches back to 55,000 calendar years before present, but it does not turn an Ice Age deposit into a diary. An animal bone, plant-rich silt or cave calcite may illuminate a broad span of centuries or millennia; it cannot securely identify one winter, migration or human visit in 31,063 BCE.

This is especially important in Ireland, where later glaciers repeatedly eroded, buried and rearranged earlier deposits. The surviving evidence is consequently patchy: sediment trapped below till in County Fermanagh; cave deposits and bones in north County Cork; and mineral layers formed by dripping water

in County Kerry. Each is a local archive with its own dating limits. Together they show that Ireland was neither a timeless frozen blank nor a landscape whose every valley can be reconstructed. Conditions varied sharply between regions and through time.

Fresh Water Beneath the Till

The best northern Irish evidence relevant to this broad period comes from Derryvree near Maguiresbridge, County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands enclosed between two thick tills, sediments deposited directly by glacier ice. The sequence matters more than its picturesque name. A glacier had occupied the site; ice-free conditions then allowed a shallow freshwater environment to form; later ice overrode and sealed that deposit. Organic-rich layers yielded a conventional radiocarbon age of about 30,500 radiocarbon years before present, with a substantial error margin. Published calibration places the deposit broadly around 36,900–31,700 calendar years before present.

The notional year 31,063 BCE falls within that broad calibrated bracket, but that does not mean that the Derryvree pool can be shown to have existed in that exact year. It does establish something more useful: during part of this interval, north-central Ireland contained ice-free ground with liquid fresh water. Plant remains, including mosses and sedges, along with pollen and insect evidence, indicate an open, treeless tundra or muskeg landscape. There were wet hollows and pools, sparse dry-ground vegetation and severe seasonal conditions. The evidence supports sedge-fringed water and exposed terrain; it does not support forests, farms, villages or a settled population.

Nearby deposits at Hollymount and Greenagho reinforce the larger point that glaciation was episodic rather than a single uninterrupted blanket. Yet they should not be used to claim that all Ireland was simultaneously ice-free. Fermanagh's buried freshwater beds are exceptional survivals. Elsewhere, ice and meltwater removed or mixed the records on which such a conclusion would depend. The island's landscapes were changing as much through erosion, deposition and frost action as through biological life.

Crag Cave and a Variable Climate

Crag Cave in County Kerry offers a different kind of evidence. Stalagmites and other speleothems form when mineral-rich water drips through limestone caves. Their growth normally requires liquid water circulating through soil and rock above the cave, and therefore tends to mark episodes when conditions were not locked beneath continuous permafrost or an ice sheet. Uranium-thorium dating of pre-Holocene speleothems from Crag Cave records repeated growth episodes through the last glacial cycle, with especially active deposition during the latter part of Marine Isotope Stage 3.

This does not provide a temperature reading for 31,063 BCE, nor can it prove that every part of Kerry was mild. Cave-water systems are local and complex. Still, the Crag Cave record is powerful corroboration for the conclusion drawn from Derryvree: the Irish climate was capable of abrupt shifts, and conditions favourable to liquid water and vegetation returned intermittently during an overall cold age. Studies comparing British and Irish cave records with ice-sheet reconstructions stress both the value and the limits of such evidence. Speleothem growth is generally a sign of ice-free, non-continuously frozen ground, but cave hydrology and limited sampling require caution.

Animals at Castlepook

In southern Ireland, Castlepook Cave near Doneraile in County Cork is the richest known Irish vertebrate-fauna site from the period leading towards the Last Glacial Maximum. Early excavations recovered more than 2,000 bones from a complicated cave system. Later radiocarbon work demonstrated that the collection spans a long interval rather than one occupation episode. The recorded fauna includes reindeer, woolly mammoth, giant deer, brown bear and spotted hyaena; later Ice Age deposits include Arctic fox, wolf and lemmings. These animals should not be imagined as a single herd or predator community standing together in one landscape scene. Different bones came from different galleries, sediments and dates.

Nevertheless, the assemblage makes one broad conclusion secure: at favourable points in the middle of the last glacial cycle, southern Ireland supported or received a diverse cold-climate fauna. Reindeer imply open grazing country; lemmings and Arctic fox point towards severe northern conditions; hyaenas reveal that caves could serve as carnivore dens and bone accumulators. This last fact is essential. Carnivores, water movement and early twentieth-century excavation methods complicate the archaeology. A cave bone is evidence of an animal's presence or transport into the cave, not automatically evidence of a human hunt, a camp or a local population.

A reindeer femur from Castlepook has been publicised as bearing a deep mark interpreted as having been made by a sharp stone tool while the bone was fresh. If that interpretation is confirmed, it would be a striking indication that people processed a reindeer in Ireland around this broad period. But it remains an isolated and contextually difficult claim. The specimen comes from an older collection, rather than a modernly excavated occupation surface with associated tools, hearths or living floor. Its date concerns the animal bone, while identifying a cut mark requires separate taphonomic judgement. No securely associated stone-tool assemblage, human bone, dwelling, burial or repeated butchered assemblage has yet demonstrated an established Upper Palaeolithic community in Ireland.

Human Possibility, Not a Lost Society

For that reason, it would be wrong to fill this year with chiefs, tribes, diplomatic contacts or warfare. There is no evidence for political institutions, territorial boundaries, language, religious practice, art, trade routes, farming, livestock keeping or permanent settlement in Ireland at this time. Even if the Castlepook mark proves human-made, it would establish an act of carcass processing, not an Irish polity or a continuous ancestry from Ice Age visitors to later inhabitants. A small mobile party might have reached the island during a favourable interval, perhaps following game across a wider north-west European landscape. That is an interpretation compatible with the evidence, not a demonstrated history.

Nor was "Ireland" necessarily isolated in the modern geographical sense. Sea levels were lower during glacial times, and coastlines lay differently, but the exact routes available varied with ice extent, sea level, currents and local topography. Lower sea level must not be converted into a confident image of an easy land bridge from continental Europe. Any human crossing would have required movement through a dangerous and environmentally shifting north Atlantic frontier.

The Advance of Ice

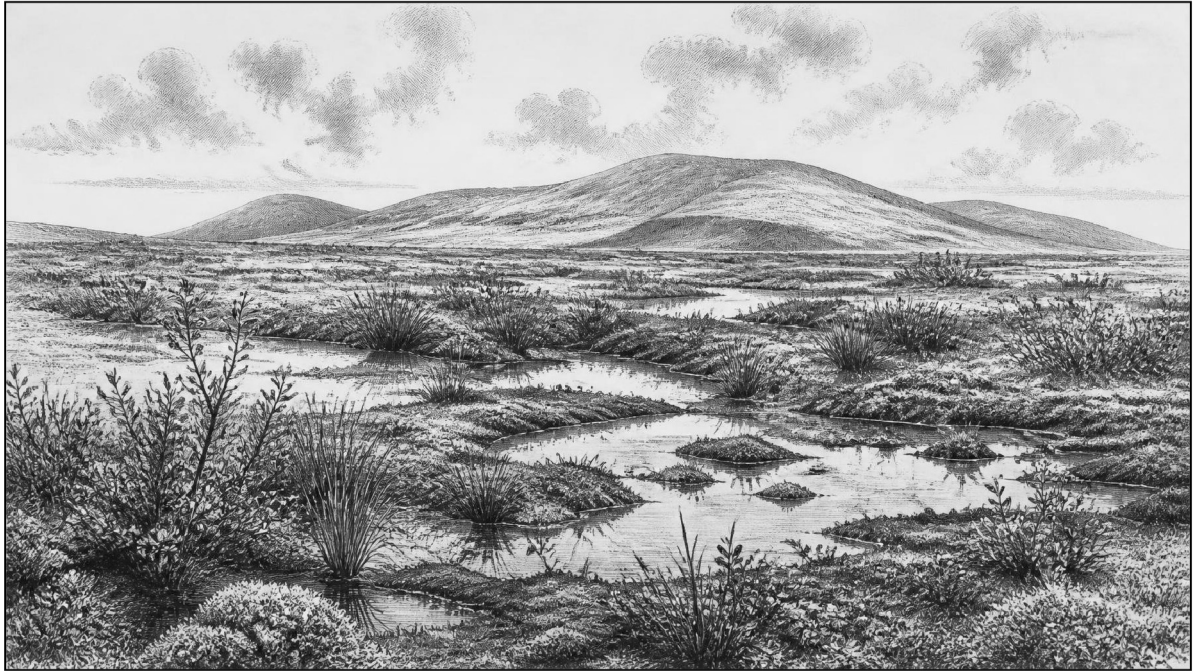
The decisive development around this broad horizon was environmental. Ice-sheet reconstructions indicate major growth of the British–Irish Ice Sheet from about 31,000 years ago onwards, while other Irish records preserve evidence of earlier advances and local ice-free intervals. There is debate over the timing and extent of particular Irish sectors, especially before the Last Glacial Maximum, and the evidence does not warrant a simple island-wide map for 31,063 BCE. What can be said is that the world documented by Derryvree’s wetland, Crag Cave’s dripstone and Castlepook’s animals was becoming increasingly constrained by colder conditions and expanding ice.

The Ireland of this period was therefore a place of tundra pools, exposed ground, caves, mobile mammals and rapidly changing climate. Its history is not yet political or literary. It survives in sediments, bones and calcite, and in the scientific work needed to date and interpret them. The strongest conclusion is also the most modest: around the time represented by 31,063 BCE, parts of Ireland could sustain cold-stage ecosystems and intermittent ice-free habitats, while any human presence remains an important possibility rather than an established society.

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31062 BCE

Fermanagh Beneath the Drumlins^[39]



31,062 BCE is a modern chronological label, not a year that can be recovered from Ireland's deep past. No community on the island recorded a calendar at this time, and neither archaeology nor environmental science can attach a particular journey, hunt or climatic episode to that single notional year. It is more responsible to place the date broadly around 33,000 calendar years before present, within the Late Pleistocene and Marine Isotope Stage 3: an unstable part of the last Ice Age, before the Last Glacial Maximum. The evidence is sparse, local and often difficult to date, but it does offer a remarkable glimpse of an Ireland in which tundra wetlands, large mammals and advancing ice shaped the possibilities of life.

A Date Within a Range

The best Irish environmental evidence relevant to this point comes from Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed an extraordinary sequence: a lower layer of glacial till, then freshwater silts and fine sands containing organic remains, and finally a second till deposited by later ice. The order of these layers is crucial. It shows that, between two episodes of glaciation, this locality was not beneath moving ice long enough for shallow water and wet ground to develop.

Organic material from the Derryvree deposit returned a conventional radiocarbon determination of 30,500 ± 1,170/–1,030 radiocarbon years BP. A radiocarbon age is not a calendar age: atmospheric carbon-14 has varied through time, and results must be calibrated against independently dated records. Published discussion using modern calibration places the Derryvree deposit broadly at about 36,900–31,700

calibrated years BP, roughly 34,950–29,750 BCE. That wide range encompasses 31,062 BCE, but it does not mean that the exposed mud was laid down in that precise year, or that every part of Ireland shared its conditions.

This distinction matters. Derryvree is evidence for one north-western Irish locality during a long cold interval. It is not a weather report for the entire island, still less a record of an Irish nation or population. The deposits nevertheless provide one of the few securely located archives from which the landscape around this broad date can be reconstructed.

An Open, Cold Wetland

The plants and small animal remains preserved at Derryvree point to open tundra vegetation and a periglacial climate: a severe environment affected by frost and cold-season ground freezing, but not necessarily covered by glacier ice at the moment the sediments accumulated. Pollen was poorly preserved, yet macrofossils and other botanical traces are unusually informative. They include mosses and plants associated with damp, cold ground and shallow freshwater, among them dwarf willow, mountain-avens and bogbean. Sedge-rich vegetation and sparse herbaceous cover would have occupied wet margins and better-drained patches.

The word “tundra” should not conjure a featureless snowfield. The Derryvree evidence suggests a mosaic of pools, silty shallows, wet mossy ground and exposed mineral soils, changing with season and water level. Bogbean, a plant of freshwater and marshy margins, is especially evocative because a fossil seed survives from the deposit. Its presence demonstrates that some standing or slow-moving water was available locally. Such details make the Irish landscape more varied than the simple image of an island sealed under ice.

There was, however, no woodland comparable to later Irish forests. The evidence supports an open landscape in which low vegetation was adapted to cold, wind, short growing seasons and disturbed ground. The capacity of this setting to sustain grazing animals depended on seasonal plant growth and on the shifting geography of ice, water and bare ground. Conditions may have altered sharply across short distances, especially near glacier margins, and changed repeatedly across centuries and millennia.

Before the Ice Sheet’s Maximum

This was not yet the fullest extent of the last British–Irish Ice Sheet. Current reconstructions generally place its final maximum advance between about 27,000 and 23,000 calibrated years BP, later than the Derryvree interval relevant to 31,062 BCE. At its maximum, ice extended widely across Ireland and onto the surrounding continental shelf. The later till that sealed the Derryvree freshwater beds records the return of glacial conditions to that particular district.

It would be misleading, though, to imagine a simple, steady march from green land to universal ice. Marine Isotope Stage 3 was marked by pronounced climatic oscillations in the North Atlantic world. Ice margins advanced and retreated; vegetation and animal habitats responded; and sediments could be eroded, redeposited or buried. Derryvree’s two tills with an organic interval between them are physical evidence for such complexity. They also explain why preservation is uneven. Later ice was capable of stripping earlier soils and archaeological traces from extensive areas, leaving caves and sealed sediments disproportionately important to research.

Regional change therefore dominates this date. Fermanagh's freshwater basin was part of an Irish landscape in transition, increasingly constrained by cold and by the growth of ice masses, yet locally capable of supporting wetland plants. The environment cannot be reduced to a national average, and the exact shape of coasts, valleys and ice-free corridors remains a matter of reconstruction rather than direct observation.

Caves and Ice-Age Animals

In southern Ireland, Castlepook Cave near Doneraile in County Cork supplies a different kind of evidence: bones rather than a wetland flora. The cave is one of Ireland's most important deposits for mammals living before the Last Glacial Maximum. Its assemblages, accumulated over more than one period and through more than one process, include remains of reindeer, brown bear, wolf or fox, hare, lemmings, giant deer, woolly mammoth and spotted hyaena. Not all were contemporary, and none should be assembled into a single imagined scene at 31,062 BCE. Their value lies in demonstrating that parts of Ireland were accessible to a varied cold-stage fauna during Marine Isotope Stage 3.

Recent redating has transformed the significance of Castlepook. Improved pretreatment of bone collagen showed that several earlier radiocarbon measurements had made material appear substantially younger than it was. The revised work indicates a deeper, pre-Last Glacial Maximum history for some species, while also warning against building historical narratives on old dates alone. Cave deposits are especially challenging: bones may have been brought in by carnivores, carried by water, disturbed by excavation or derived from layers of very different ages.

Spotted hyaena is a powerful reminder that the Late Pleistocene animal world was not simply a modern Irish fauna in colder weather. Its presence at Castlepook belongs to an earlier part of the cave's MIS 3 record and indicates ecological connections with Britain and continental north-west Europe. Reindeer, in turn, were well suited to open country, while small mammals such as lemmings indicate severe conditions. These fossils establish environmental possibility, not a settled human landscape.

The Human Question

A reindeer femur from Castlepook has attracted exceptional attention because it bears a deep linear mark interpreted by zooarchaeologist Ruth Carden as a cut or chop made with a sharp stone implement on fresh bone. The specimen has been associated in public discussion with an age of about 33,000 radiocarbon years BP. If the interpretation is upheld, it could represent Ireland's earliest known evidence for human handling of an animal, many millennia earlier than the securely documented post-glacial settlement record.

The claim must remain carefully bounded. A modified bone can indicate the processing of a carcass; it does not prove a permanent settlement, a village, a population spread across the island or a named Palaeolithic culture in Ireland. No securely associated hearth, stone-tool assemblage, dwelling surface, burial or repeated concentration of butchered remains has yet been demonstrated at Castlepook for this age. Excavations in 2022 located surviving cave sediments and Pleistocene faunal material, but recovered no cultural artefacts. The work is important precisely because it leaves open the prospect of better-contexted evidence rather than resolving the question prematurely.

If people did reach Ireland during this broad interval, they would have been highly mobile hunter-gatherers operating at the far western edge of Upper Palaeolithic Europe. Reindeer could have offered meat, fat, hide, sinew and bone, but those are general possibilities, not documented Irish practices. There

is no responsible basis for describing their language, kinship, shelters, seasonal route or numbers. Even a brief visit by a small hunting party would be archaeologically significant; it would still be very different from sustained colonisation.

No Politics, No Trade, No Recorded Belief

Political affairs, diplomacy and organised warfare are beyond the reach of the evidence for Ireland around 31,062 BCE. There are no rulers, territories, monuments, written traditions or identifiable communities to name. Nor is there evidence for trade networks, farming, metalworking, seafaring exchange or formal religious practice. These are not missing chapters awaiting a confident retelling; they are questions for which the surviving record is silent.

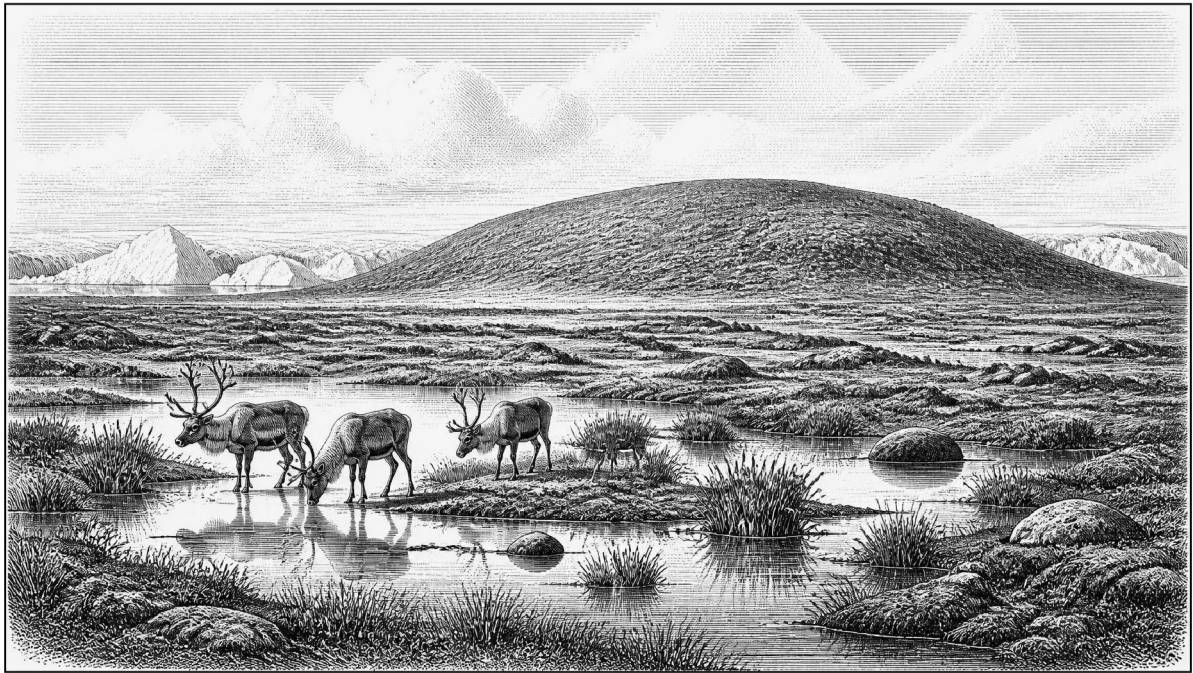
Culture and learning can be discussed only in the broadest human sense. The possible Castlepook bone mark, if anthropogenic, implies practical knowledge of cutting implements and animal anatomy. Derryvree's plant remains reveal nothing directly about human knowledge, but they illuminate the demanding setting in which any visitors would have moved. The decisive history of this date is environmental: short-lived ice-free habitats, cold-water wetlands, animal movements and the looming expansion of ice.

For Ireland, then, 31,062 BCE is best understood not as a year of events but as a point within a long calibrated range. Beneath a Fermanagh drumlin, freshwater mud preserved the signature of an open tundra wetland. In a Cork cave, bones preserve a more fragmentary record of Ice-Age mammals and a cautious possibility of human activity. Together they show an island that was neither timelessly frozen nor recognisably inhabited, but environmentally dynamic, sparsely evidenced and on the threshold of far more extensive glaciation.

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31061 BCE

Fermanagh's Intertill Tundra^[40]



31,061 BCE is a modern chronological label, not a year that can be recovered from Ireland's archaeological record. It is approximately 33,010 years before AD 1950, the conventional "present" used in radiocarbon dating. No Irish community then used a calendar, left writing, named leaders, or produced a sequence capable of identifying a particular twelve-month span. The responsible frame is therefore the Late Pleistocene, during Marine Isotope Stage 3: a long, climatically unstable part of the last Ice Age, before the fullest extent of the Last Glacial Maximum.

The evidence is sparse, local and unevenly dated. It consists chiefly of buried freshwater sediments, glacial deposits, cave bones, and modern scientific analyses of them. It can illuminate environments and animal presence across broad spans of millennia. It cannot supply an event-by-event history of an Irish people, nor prove that all parts of the island shared one climate, landscape or human history at the same time.

A Date Within Broad Ranges

The most important Irish environmental sequence relevant to this period was exposed during road works in 1969 at Derryvree, near Maguiresbridge in County Fermanagh. The cutting passed through a drumlin and revealed silts and fine sands, including organic layers, trapped between two separate tills: unsorted sediments deposited by glacier ice. The stratigraphy is clear in its relative order. Ice had formed the lower till; an interval without ice at the locality allowed freshwater sediment and plant remains to accumulate; then a later ice advance laid down the upper till and sealed the earlier wetland.

Organic material from Derryvree produced the radiocarbon determination Birm-166, 30,500 radiocarbon years BP, with a substantial uncertainty of minus 1,030 and plus 1,170 years. Such a result cannot be read as a calendar date. Atmospheric radiocarbon changed through time, so results require

calibration against independently dated records such as IntCal20; at this age, both the laboratory error and the form of the calibration curve produce wide calendar ranges. In broad terms, the Derryvree deposits belong to the middle-to-later part of the last Ice Age, around the mid-30,000s calibrated years before present. The label 31,061 BCE may fall near the chronological horizon under discussion, but it cannot be assigned to a particular sediment layer, season or episode at Derryvree.

This distinction matters. Derryvree is not evidence that the whole of Ireland was ice-free, nor that an open wetland persisted unchanged for thousands of years. It is powerful evidence that this part of Fermanagh experienced a non-glacial interval between episodes of ice cover. The wider island was a moving mosaic of ice, periglacial ground, water, exposed rock and habitat, changing as the British–Irish Ice Sheet grew and shifted.

Wetland Beneath the Drumlin

The Derryvree flora and fauna indicate a treeless, cold, periglacial landscape. The freshwater deposits contained remains of mosses and plants suited to open, wet ground, including sedges and aquatic or marsh vegetation. Rather than imagining modern blanket bog or green pasture, it is better to picture shallow pools, saturated silts, sedge-rich margins and open tundra-like ground, with vegetation low to the surface and exposed to severe seasonal conditions. The older term “muskeg”, used in descriptions of the deposit, conveys a waterlogged, mossy, cold-climate wetland rather than a forested landscape.

That evidence is especially valuable because glaciation later destroyed, buried or reworked much of the earlier land surface. Pollen grains, plant macrofossils and small animal remains are therefore not minor details: they are among the few direct witnesses to an Irish ecosystem before the Last Glacial Maximum. They show that life could occupy local refuges between glacial advances, even where no human settlement is known.

The climate was not simply a single unbroken “Ice Age winter”. Marine Isotope Stage 3 contained abrupt climatic oscillations recorded particularly well in Greenland ice cores and North Atlantic archives. Ireland lay at the Atlantic edge of north-west Europe, where changes in temperature, sea ice, precipitation and ocean circulation could alter ice margins and habitats rapidly in geological terms. Yet the available Irish sequences do not permit those wider fluctuations to be matched confidently to one notional calendar year at Derryvree.

Ice, Sea and a Changing Island

At this time Ireland’s geography was shaped as much by ice and sea level as by land. Global sea levels were far lower than today because water was stored in continental ice sheets, but low sea level did not automatically create a reliable dry-land route from Ireland to Britain. Geological research has challenged the older assumption of a broad Irish land bridge. The Irish Sea basin, changing relative sea level, islands, glaciers and sea ice created more complicated possibilities. For this period, neither a simple land bridge nor an easy crossing should be assumed.

Evidence from western Ireland shows that the Irish Ice Sheet was already substantial and dynamic before the later maximum. Marine and glacial deposits indicate major ice-sheet loading and fluctuations on the continental shelf over a long interval before the Last Glacial Maximum. Other reconstructions place the greatest late-glacial expansion of the British–Irish Ice Sheet later, broadly after 27,000 years ago

and with major maximum positions in the 26,000–20,000-years-ago range, depending on sector and method. Thus 31,061 BCE belongs to an iceward world, but not to a neat island-wide moment when every valley and coast can be classified as either frozen or free of ice.

This regional variation is central to understanding settlement potential. An ice-free patch of wetland could support plants and animals, while nearby terrain might be dominated by glacier ice, meltwater or bare, frost-shattered ground. The archaeological record is correspondingly selective: caves preserve bones in the south, intertill sediments preserve plants in Fermanagh, and offshore deposits preserve parts of an ice-sheet history now beyond the modern coast.

Castlepook's Animal World

Castlepook Cave, also known as Mammoth Cave, near Doneraile in north County Cork, provides the most striking animal evidence for the broader period. Its chambers have yielded remains of woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. The cave lies in the Awbeg Valley below the Ballyhoura Hills, and its faunal collection is among Ireland's richest records of Pleistocene vertebrates.

Radiocarbon work on the cave assemblage has produced pre-Last Glacial Maximum dates for different animals. Examples include mammoth dated to $34,100 \pm 840$ radiocarbon years BP, reindeer to $35,200 \pm 950$ BP, giant deer to $32,060 \pm 630$ BP, and brown bear to $33,310 \pm 770$ BP. These are not evidence that every species stood together at Castlepook in a single generation. Cave deposits often mix material from distinct episodes, while many of the earliest excavations removed bones before modern recording standards existed. The most defensible conclusion is that cold-adapted and open-country animals reached Ireland intermittently during this general Late Pleistocene interval.

Predators are important evidence in their own right. Spotted hyaena remains and carnivore damage on bone show that caves were part of animal landscapes, not automatically human homes. A cave may have been a den, a trap, a shelter, a place where water and sediment accumulated, or a location into which bones were dragged. The animal record conveys a food web: large herbivores feeding in open habitats, carnivores scavenging or hunting them, and smaller cold-adapted mammals occupying the same wider environmental zone.

The Human Question

A reindeer femur from Castlepook has been reported as about 33,000 years old and as bearing a mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool during carcass processing. If that interpretation is upheld, it would be Ireland's earliest currently proposed sign of human activity, far earlier than the island's securely documented Mesolithic settlement. It raises the possibility that Upper Palaeolithic people reached Ireland briefly during a favourable window.

But "possible human activity" is not the same as an established settlement. The femur comes from a historically excavated cave collection rather than a recently excavated, tightly controlled occupation layer. No securely associated hearth, tool assemblage, dwelling floor, burial, repeated campsite or contemporaneous group of butchered animals has yet been demonstrated for Ireland at this date. The mark may be significant, but it cannot identify the number of visitors, their route, language, ancestry, season of arrival or length of stay. It certainly cannot support claims of a resident population spread across the island.

For the same reason, there is no responsible evidence for political affairs, diplomacy, warfare, named communities, religious observance, formal trade or artistic traditions in Ireland in 31,061 BCE. No houses, monuments, pottery, metalwork, textiles, carvings or written marks are known from an Irish human community of this age. Continental Europe had Upper Palaeolithic societies with varied technologies, exchange networks and forms of symbolic expression, but these cannot be transferred automatically across the sea to Ireland.

What Can Be Said of Everyday Life

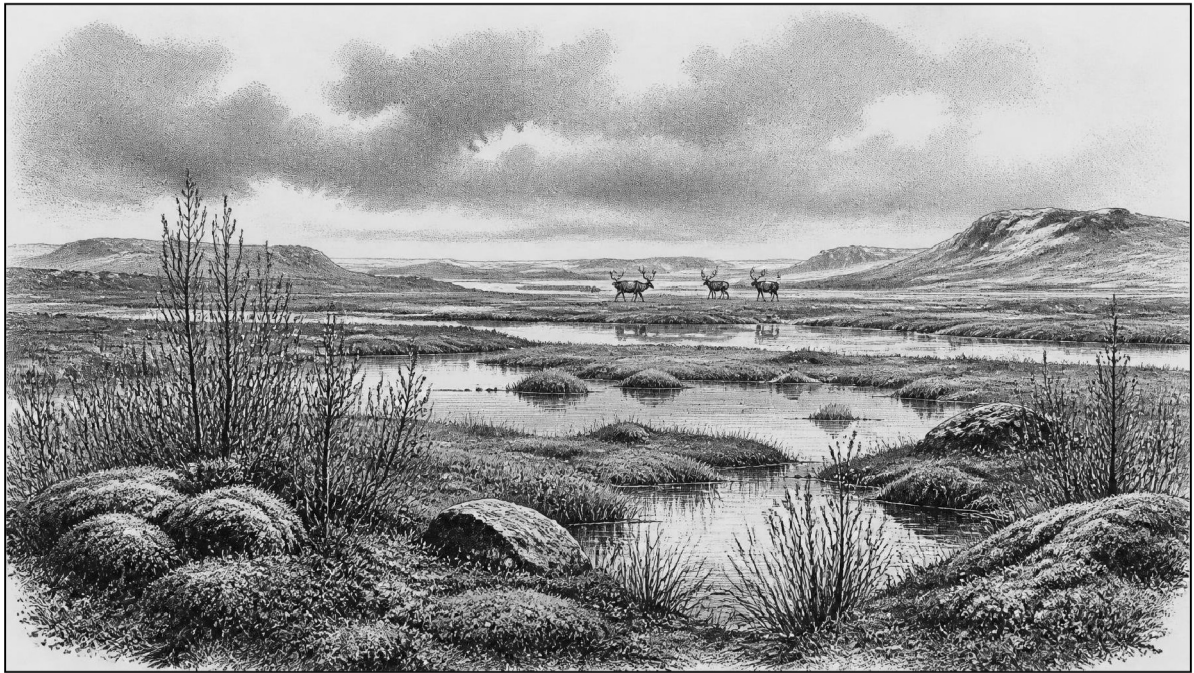
If people did visit, their practical concerns would have been immediate: moving through a dangerous cold landscape, locating fresh water and shelter, using fire and portable equipment, and obtaining animal food where opportunity allowed. Reindeer would have been a valuable source of meat, hide, sinew and bone; the Castlepook femur, if genuinely butchered by people, would preserve only one small act within such a task. That is an interpretation from comparative Upper Palaeolithic archaeology, not a direct reconstruction of a known Irish camp.

The more secure story is environmental. Around the broad period represented by 31,061 BCE, Ireland was not the later wooded island of farming communities, kingdoms and monasteries. It was a fluctuating Pleistocene landscape on the Atlantic fringe, repeatedly remade by ice. Fermanagh's buried freshwater sediments demonstrate local wetland life between glacial episodes. Cork's caves demonstrate that a varied cold-climate fauna reached the island. Castlepook's marked reindeer bone poses, but does not settle, the question of early human visitors. The gaps in that story are not failures of imagination; they are the essential historical fact.

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31060 BCE

BIRM-166 Before Glaciation^[41]



The label 31,060 BCE is a modern way of locating an immensely remote interval, not a year that can be recovered from an Irish calendar or historical record. It corresponds roughly to 33,010 years before the conventional radiocarbon baseline of 1950, but that arithmetic conversion must not be mistaken for a precisely calibrated archaeological date. No Irish event, person, settlement or season can be assigned to this particular year. The responsible subject is instead Ireland during the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, when climates fluctuated sharply and the island's landscapes, animal populations and possible human visitors left only scattered traces.

An Approximate Horizon

At this broad horizon, Ireland was entering the colder trajectory that would culminate in extensive glaciation. The timing and extent of ice growth remain matters of active research, and the island was not necessarily covered uniformly at every moment. Current syntheses place the principal build-up of the British–Irish Ice Sheet after roughly 35,000–32,000 calibrated years ago, with its maximum much later, broadly between about 27,000 and 21,000 years ago. Thus 31,060 BCE belongs near a transition: a time when cold-stage conditions, expanding ice and changing sea level increasingly shaped the possibilities for life.

It would be misleading to picture modern Ireland under a simple white blanket. The evidence instead points to a varied, unstable northern landscape: exposed ground, periglacial soils repeatedly frozen and thawed, short growing seasons, pools and wetlands in sheltered hollows, and locally different conditions

according to altitude, drainage and proximity to ice. The familiar wooded island of later millennia did not exist. Trees were severely restricted or absent across much of the region; vegetation was predominantly open and cold-adapted.

The Derryvree Evidence

One of the most useful Irish archives is Derryvree in County Fermanagh. There, a road cutting through a drumlin exposed organic freshwater silts and sands sealed between two layers of glacial sediment, or till. The organic deposit produced the radiocarbon measurement BIRM-166: $30,500 \pm 1,100$ radiocarbon years before present. Modern calibration gives a broad range of approximately 36,900–31,700 calendar years before present. That range overlaps the general timescale represented by 31,060 BCE, but it does not date a single day, year or even necessarily the entire deposit to that point.

The Derryvree sediments are valuable because their pollen, plant remains and associated deposits record an ice-free episode in north-central Ireland before renewed glaciation. They indicate a treeless, wet, cold environment often described as tundra or muskeg: sedges, mosses, dwarf shrubs and hardy herbs around shallow fresh water. Finds such as bogbean, water-milfoil, mountain-avens, clubmosses and dwarf willow show that this was not barren ground. It was a functioning wetland ecosystem, though one unlike the modern Fermanagh landscape. Freshwater plants imply open pools or slow water; sedges and mosses indicate marshy margins; arctic-alpine species point to a rigorous climate.

That evidence should not be stretched into a map of the entire island. Derryvree records one locality, and its sediments accumulated over time. Nevertheless, it establishes an important point: parts of Ireland remained capable of sustaining vegetation and freshwater habitats before the great ice advance. In historical terms, the leading development was environmental rather than political—the contraction of habitable ground as cold intensified and ice sheets grew.

Animals in an Open Landscape

Caves in the limestone country around Castlepook, near Doneraile in north County Cork, provide a complementary but differently problematic record. Excavations conducted between 1904 and 1918 recovered a major collection of Pleistocene animal bones. The National Museum of Ireland preserves material including spotted hyaena, while research on the wider assemblage has identified woolly mammoth, reindeer, giant deer, brown bear, Arctic fox, wolf, hare, stoat and lemmings. These animals were not necessarily present together in one season or even one millennium: cave deposits can combine remains accumulated over long periods, moved by water, scavengers, carnivores and early excavators.

Even so, the fauna demonstrates that pre-maximum Ireland was intermittently linked to a wider north-west European cold-stage world. Reindeer and lemmings support the picture of open, chilly habitats; mammoth and giant deer attest to substantial grazing or browsing animals; hyaenas and wolves reveal predators and scavengers within the food web. Castlepook was especially important as a carnivore site. Bones in a hyaena-used cave cannot simply be read as the leftovers of people: carnivores transported, chewed and altered carcass parts, creating a crucial warning for archaeological interpretation.

Sea levels were much lower than today because large volumes of water were stored in continental ice sheets. Ireland was therefore less isolated than the modern island, though the exact configuration of land, sea, ice and passable routes changed through time. The animal record supports connectivity with Britain and ultimately continental Europe; it does not demonstrate one permanent land bridge, one migration path or a human crossing at this exact date.

The Reindeer Femur Question

The closest possible evidence for people near this broad period is a reindeer femur from Castlepook. Re-examination of the old collection identified a deep linear mark interpreted by zooarchaeologist Ruth Carden as damage made with a sharp stone tool while fresh bone was being processed. The bone has been publicly reported as approximately 33,000 years old. If the mark is confirmed as human-made and contemporary with the animal's death, it would be evidence that a person or people handled a reindeer in Ireland during the Upper Palaeolithic—far earlier than the securely established post-glacial settlement record.

Its importance requires equal caution. The specimen comes from an antiquarian cave collection, not a modernly excavated occupation floor with recorded layers, a hearth, tools and food waste in place. A radiocarbon determination dates the animal, not automatically the cut. Identifying a stone-tool mark is a separate specialist judgement, because trampling, carnivore damage, weathering and excavation can all modify bone. Nor can one limb fragment reveal whether people killed the reindeer, scavenged it, removed meat or hide, opened the bone for marrow, or processed it elsewhere before the fragment entered the cave.

The most that can responsibly be inferred is modest but significant: brief human visitation is possible, and perhaps supported by this object; permanent occupation is not demonstrated. There is no securely dated Irish dwelling, fireplace, stone-tool assemblage, burial, personal ornament, art object or human bone from around 31,060 BCE. A hunter-gatherer party exploiting a large animal is plausible in the wider European context, but it remains an interpretation rather than a documented Irish community.

Society Beyond the Record

Accordingly, political affairs, diplomacy and organised conflict cannot be reconstructed for Ireland at this date. There is no evidence for leaders, territories, named peoples, alliances, warfare, language or institutions. It would be anachronistic to project later Gaelic, Celtic or Irish identities into the Late Pleistocene. Religion and culture are equally beyond direct recovery: no Irish ritual place, image, grave, musical object or teaching tradition of this age has been identified.

If people did reach the island, their economy would have depended on mobile foraging and intimate knowledge of animal movement, weather, raw materials, shelter and fuel. Such a statement follows from Upper Palaeolithic lifeways elsewhere in Europe, not from a fully evidenced Irish camp. There is no basis for claiming trade networks, settled villages or regular seasonal circuits in Ireland itself. The tangible economy visible in the record is ecological: plants fixing themselves in wet ground, herbivores moving through open country, and predators and scavengers following them.

Approaching the Ice Maximum

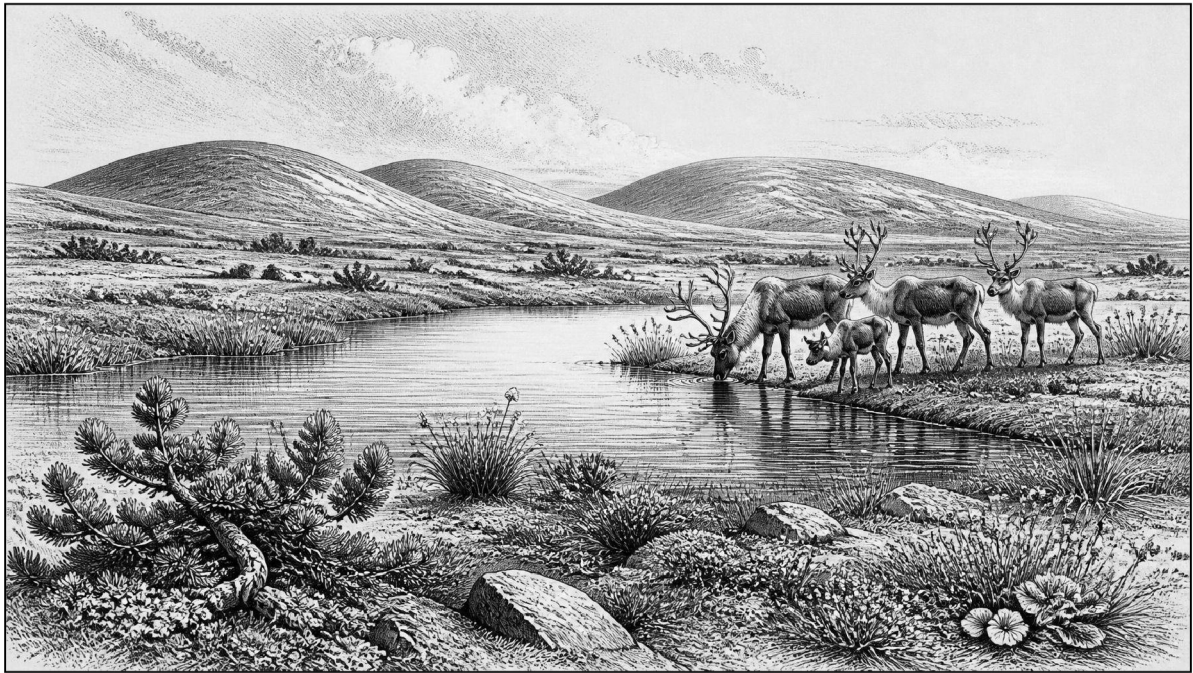
The long-term regional change was decisive. In the millennia after this approximate horizon, the British–Irish Ice Sheet expanded, reworked older landscapes and buried or removed much of the evidence that might once have survived. Glacial erosion helps explain why Ireland's record of early human activity is exceptionally sparse compared with parts of Britain and continental Europe. It also means absence of evidence cannot prove that no person ever arrived before the final glaciation; it does mean that claims of a settled Ice Age population currently outrun the data.

Ireland around 31,060 BCE is therefore best understood through a buried wetland in Fermanagh, cave fauna in Cork, uncertain routes across a lower-sea-level north-west Europe, and a single contested mark on reindeer bone. These traces illuminate a cold but living country on the threshold of greater ice. They do not provide an annual chronicle. Their real historical value lies in showing how climate change, animal mobility and the survival of fragile deposits set the limits of what can be known about Ireland's deepest human past.

Chapter 042 of 100

31059 BCE

The Maguiresbridge Waterline^[42]



“31,059 BCE” is a modern calendar label, not a date that can be identified in Ireland’s archaeological record. It is roughly 33,008 years before AD 1950, the conventional reference point for “BP” dating, but no excavated Irish deposit can resolve conditions to that particular year. The responsible subject is therefore a broad Late Pleistocene horizon: part of Marine Isotope Stage 3 (MIS 3), a climatically unstable interval before the Last Glacial Maximum. The strongest evidence comes from sediments and fossils that span centuries or millennia, not from an event, ruler, settlement or calendar day.

A Date Inside a Range

The nearest important Irish chronological marker is the Derryvree freshwater series near Maguiresbridge, County Fermanagh. Organic material from this deposit produced the conventional radiocarbon determination BIRM-166: 30,500 radiocarbon years BP, with a large uncertainty of +1,170/–1,030 years. Radiocarbon years are not identical to calendar years because the amount of atmospheric carbon-14 has varied through time. Modern calibration therefore turns this result into a broad probability range rather than a single answer. The interval is commonly placed at approximately 36,900–31,700 calibrated years BP, or about 34,950–29,750 BCE. The article’s notional year falls within that broad span, but it cannot be assigned to a particular layer, season or episode at Derryvree.

This distinction matters. It would be misleading to say that a particular animal crossed Fermanagh, that a pool froze, or that an ice margin advanced in 31,059 BCE. What can responsibly be said is that the Derryvree evidence illuminates an interval in which part of northern Ireland was locally ice-free long

enough for freshwater sediment and organic remains to accumulate. It also shows that this interval lay between two episodes of glacial deposition. The landscape had already been affected by ice, and it would later be overridden or surrounded by renewed ice-sheet growth.

Freshwater Beneath a Drumlin

Derryvree is valuable because roadworks in 1969 exposed an unusual sequence through a drumlin. Beneath the familiar streamlined hill were two distinct layers of till: unsorted sediment deposited by glacier ice. Between them lay freshwater silts and fine sands containing plant and animal remains. This was not an ancient village site and it produced no architecture, tools or burials. Its importance lies in the order of the deposits. A former glacial phase created the lower till; an interval without ice at that spot permitted a wetland or shallow-water environment to develop; then a later glacier sealed the evidence beneath another till.

The deposits do not provide a map of the whole island. A local freshwater basin may have persisted while high ground, nearby valleys or other regions experienced very different conditions. Nor do the sediments show that Ireland was continuously free of ice. They do, however, firmly contradict any simple image of an island uniformly buried beneath a permanent ice sheet throughout the whole last cold stage. Around the broad period represented by BIRM-166, Ireland contained changing local environments whose histories must be reconstructed separately.

An Open, Frost-Worked Country

Plant macrofossils, pollen, mosses and insect evidence from Derryvree support an open, treeless, frost-influenced landscape. Grasses, sedges, herbs and juniper occur among the principal indicators, while aquatic and wet-ground plants show that freshwater persisted in the basin. A seed of bogbean (*Menyanthes trifoliata*) is especially telling: it is evidence for wet margins or shallow freshwater, not for a featureless desert of snow and stone. Other records associated with the deposit include cold-adapted plants such as mountain-avens and lesser clubmoss. Together they support comparison with tundra and muskeg-like wetland, provided those modern labels are treated as approximations rather than exact replicas of a living Irish ecosystem.

The likely scene was therefore one of pronounced seasonality. Short summers could support low vegetation around pools, sedge-rich ground and damp hollows; winter cold, wind and repeated freezing would have constrained tree growth and disturbed exposed soils. The evidence is stronger for a mosaic of wet ground and sparse open vegetation than for continuous pasture or woodland. It gives no secure annual temperature for 31,059 BCE, and Ireland's Atlantic position makes simple comparisons with continental tundra hazardous. Yet the biological remains show that freshwater life and cold-tolerant vegetation could endure in at least one northern basin during this long, variable cold-stage interval.

Caves and Mobile Fauna

Southern Ireland supplies a different kind of evidence. Castlepook Cave, also known as Mammoth Cave, near Doneraile in County Cork, has yielded one of the island's most important Ice Age mammal assemblages. Its remains include spotted hyena, reindeer, mammoth, giant deer, brown bear, wolf, Arctic

fox, lemmings and mountain hare. The cave record demonstrates that, before the later maximum expansion of the British–Irish Ice Sheet, Ireland was at times part of a wider north-west European zone in which cold-stage mammals could reach and occupy suitable habitats.

These animals must not be turned into a parade for a single year. Cave deposits are commonly accumulated over long periods, and many Irish assemblages were excavated in the nineteenth and early twentieth centuries, when recording methods were less exacting than today. Later accelerator radiocarbon work has revised some apparently young dates from southern Irish caves, showing that certain faunal remains are substantially older than once thought. Castlepook is thus excellent evidence for the wider MIS 3 faunal world, but it cannot prove that every listed species stood together in Cork in 31,059 BCE.

Before the Greatest Ice Expansion

The period represented by Derryvree preceded the global Last Glacial Maximum, generally dated to about 26,500–19,000 years ago. In Ireland, the most extensive later ice-sheet configuration developed after the interval discussed here, with evidence indicating maximum offshore and marine-margin positions broadly around 25,000–23,000 years ago in several sectors. The later Irish Ice Sheet reached far onto the Atlantic shelf in the west and was linked to the larger British–Irish Ice Sheet system. Its advance reshaped lowlands, deposited tills, deepened basins and destroyed or buried much older surface evidence.

At about 31,059 BCE, then, regional change rather than stasis is the key theme. Ice, water, exposed ground and ecological corridors shifted over long timescales. Lower sea levels altered coastlines and exposed parts of the continental shelf, but the available evidence does not justify drawing a single reliable shoreline or land bridge for this precise year. Nor can animal bones by themselves demonstrate a particular migration route. They show possibility and presence across broad intervals; they do not provide a timetable of arrivals.

No Irish Society Yet Documented

There is no reliable evidence for a human community in Ireland at this date. No securely dated camp, hearth, stone-tool assemblage, grave, dwelling or artwork belongs to around 31,059 BCE. The National Museum of Ireland accordingly notes that clear evidence for Palaeolithic human presence has not emerged. Research at Alice and Gwendoline Cave in County Clare has produced evidence relevant to human activity much later, in the terminal Pleistocene, while sustained settlement is associated with Mesolithic communities after the Ice Age. Such discoveries make the question of very early visitation worth investigating; they do not establish people in Ireland during the Derryvree interval.

Political affairs, warfare, diplomacy, religion, learning, trade and social hierarchy therefore cannot be reconstructed for Ireland in this period. There were no documented polities, leaders, exchange networks or ritual institutions. Predators competed with prey and carcasses were scavenged, but that is ecology, not human conflict. Likewise, the movement of reindeer or hyena across a changing northern landscape must not be described as trade. The only responsible “economy” here is the natural circulation of energy through plants, herbivores, carnivores, freshwater organisms and seasonal habitats.

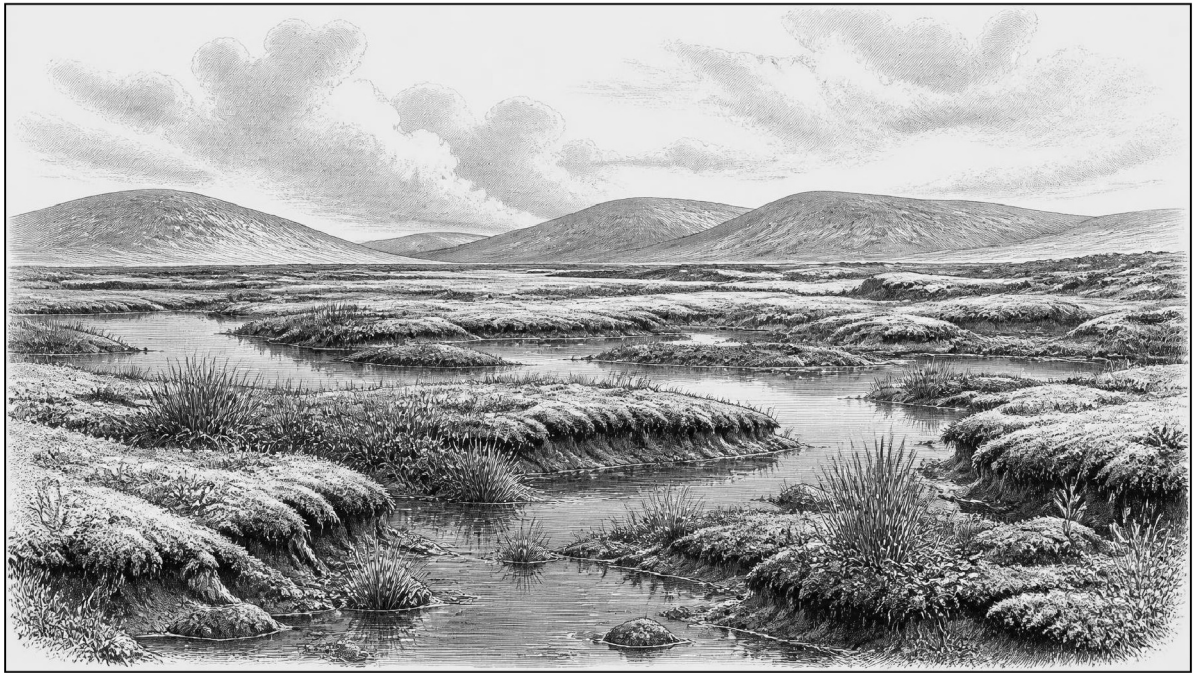
What This Horizon Means

The Maguiresbridge evidence gives Ireland a deep history richer than a simple blank before farming and monuments. Around the broad range containing 31,059 BCE, the island was not a historical society waiting to begin; it was a changing cold-stage environment. At Derryvree, freshwater accumulated between glacial episodes and preserved traces of tundra wetland. At Castlepook, bones preserve evidence of a lost animal world. These archives are fragmentary, locally specific and sometimes difficult to date, but they are tangible. Their lesson is not that one dramatic thing happened in a named year. It is that Ireland's landscape, waters and animal communities were already being repeatedly remade by climate and ice tens of millennia before the first securely documented human societies on the island.

Chapter 043 of 100

31058 BCE

Derryvree's Sedge Country^[43]



The label “31,058 BCE” cannot describe a dated Irish event, ruler or settlement episode. At this depth of time, modern calendar-year precision is unavailable. It is a convenient point within the Late Pleistocene, broadly Marine Isotope Stage 3, rather than an anniversary in any meaningful historical sense. The most responsible evidence comes from radiocarbon ranges, the order of sediments in a section, fossil plants and animals, and wider reconstructions of the growing British–Irish Ice Sheet. These sources can illuminate conditions in Ireland around this notional date; they cannot tell us what happened in one particular year.

The nearest unusually informative Irish archive is Derryvree townland, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut into a drumlin and exposed freshwater silts and fine sands containing organic remains between two thick layers of glacial till. The sequence gives a firm relative history: glacier ice deposited the lower till; an ice-free interval allowed water, sediment, plants and small animals to accumulate; later ice buried the deposit beneath fresh till. That order is evidence. It does not provide a continuous diary of the landscape.

A Date Inside a Range

Organic material from the Derryvree deposit produced a radiocarbon determination of about 30,500 radiocarbon years before present, with an uncertainty of roughly a millennium. Published calibrations have placed it broadly between about 36,900 and 31,700 calibrated years before present, approximately 34,950–29,750 BCE. The requested date falls within that wide span. It cannot be assigned to a particular pool, season, plant colony or animal track in the deposit. Calibration itself is essential: radiocarbon years are not identical to calendar years, because atmospheric carbon-14 has varied through time.

This caution matters particularly in an Irish context. Evidence from the island is sparse, discontinuous and often preserved only where later ice failed to remove it or where it sealed older material beneath till. The apparent precision of a numbered BCE year can therefore be misleading. What can be said is that Derryvree preserves an episode when north-central Ireland was locally ice-free, cold and wet before the great expansion of the final Irish ice sheet. It is one of the few Irish records able to give this otherwise almost invisible world some texture.

Ice Was Advancing, Not Yet Everywhere

About 31,058 BCE, Ireland was in the later part of the last Ice Age but was not simply a land uniformly entombed under ice. Research on the British–Irish Ice Sheet generally places its major build-up after roughly 35,000–32,000 years ago, with its maximum extent substantially later, broadly around 27,000–21,000 years ago. The Derryvree sequence, together with other dated deposits in Fermanagh and western Ireland, indicates that some regions remained ice-free during parts of this earlier interval. Conditions varied sharply by locality and changed over long, uneven timescales.

That does not imply a benign landscape. Ireland lay on the Atlantic edge of a northern world prone to abrupt climatic swings. Marine Isotope Stage 3 included rapid North Atlantic stadial and interstadial shifts, expressed in temperature, sea ice, rainfall and vegetation. A freshwater hollow might persist for generations or longer, while ice accumulated in uplands or advanced elsewhere. The later drumlin that enclosed Derryvree's sediments is itself a reminder that this respite was temporary: moving ice would ultimately remodel and cover the ground.

Present coastlines should not be projected backwards without care. Global sea level was much lower than today because water was locked in continental ice sheets, but the shape of the Irish Sea region was also governed by local ice, changing crustal levels, marine basins and drainage. It is reasonable to see Ireland as less isolated geographically than it is now, with opportunities for animal movement from Britain during suitable phases. It is not responsible, however, to draw a single certain land bridge or migration route for this particular date.

Mosses, Sedges and Open Water

Derryvree's fossil evidence gives the clearest view of everyday ecology. Pollen, plant macrofossils, mosses and invertebrate remains point to open tundra vegetation and a periglacial climate: land shaped by intense cold, seasonal thaw and frozen ground, rather than by permanent ice at that locality. Sedges and grasses, mossy wet ground, low herbs and scattered dwarf shrubs were more plausible components of the scene than woodland. Pollen attributed to trees must be treated cautiously, since it may have travelled long distances or been redeposited from older sediments.

The deposit has often been interpreted as a muskeg-like environment: saturated organic ground with shallow pools, silty water and patches of emergent vegetation. Such a place was ecologically active, not empty. Insects and freshwater organisms, moss carpets and sedge beds responded to the brief growing season; meltwater and poor drainage shaped the ground beneath them. Yet a productive summer wetland should not be mistaken for a stable refuge. Winters were severe, growing seasons short, and frost processes would have influenced soil, water flow and the distribution of plants.

This was also a regional landscape in transition. The forests, fields, bogs and settled shorelines familiar from later Irish history did not exist. Much of the modern surface expression of Ireland's terrain would be altered by subsequent glacial erosion and deposition. Nonetheless, the sediments beneath

Derryvree's drumlin preserve evidence that the island's glacial history was punctuated by environments in which freshwater life and tundra vegetation could flourish.

The Cave-Fauna Warning

Southern Irish caves provide another, more difficult line of evidence. Castlepook, or Mammoth Cave, near Doneraile in County Cork yielded Ireland's richest known assemblage of mammals from the last cold stage, including remains attributed to woolly mammoth, giant deer, brown bear, wolf, Arctic fox, wild horse, lemmings and spotted hyena. The National Museum of Ireland notes that spotted hyena and other mammals reached Ireland from Britain during a broad interval around 45,000–30,000 years ago. Such remains demonstrate that Ireland could support, at different times in the Late Pleistocene, a strikingly varied large-mammal community.

But the cave record must not be turned into a neat wildlife list for 31,058 BCE. Many cave deposits were excavated in the early twentieth century, when recovery and recording standards differed from those now expected. Bones may have been disturbed, moved within caves or mixed from separate episodes. More recent radiocarbon work has shown that several earlier determinations from Castlepook were substantially too young, pushing some faunal evidence farther back into Marine Isotope Stage 3. A species represented in the cave therefore need not have lived there, or anywhere else in Ireland, in the exact calendar year under consideration.

The safest interpretation is broader: the island's fauna changed repeatedly as climate, ice cover, vegetation and access routes changed. Animal bones attest to former presence, not to political territories, managed herds or a settled human economy. They do, however, show that cold-stage Ireland was connected to wider north-west European ecological systems rather than existing as an isolated biological backwater.

No Demonstrated Human Community

There is no securely dated evidence for a human community in Ireland around 31,058 BCE. No camp, hearth, stone-tool assemblage, burial, house, boat or worked bone can responsibly be placed in this year or in the Derryvree interval. The earliest widely accepted direct evidence for people in Ireland remains far later: a butchered brown-bear patella from County Clare dated to roughly 12,810–12,590 calibrated years before present. That finding is important precisely because it is direct, dated evidence rather than an inference from animal movements or a suggestive mark on a bone.

Humans certainly lived elsewhere in north-west Europe during the Upper Palaeolithic, and changing sea levels may have made Ireland more accessible at some periods. Neither fact proves occupation here. Potential access is not evidence of arrival; the survival of suitable game is not evidence of hunting; and the absence of surviving sites is not proof that no person ever entered the island. For this date, the appropriate conclusion is agnosticism: temporary visits remain conceivable, but permanent settlement, social groups and lifeways in Ireland have not been demonstrated.

History Before Institutions

Accordingly, political affairs, diplomacy, warfare, religion, formal learning, trade and named leaders cannot be recovered for Ireland at this point. There were no written records, and there is no material basis for reconstructing tribes, alliances, ritual centres or exchange networks. To supply them would be

invention. The meaningful “regional change” was environmental: ice expansion, altered drainage, tundra development, shifts in animal range and the intermittent opening or closure of routes across the surrounding seas.

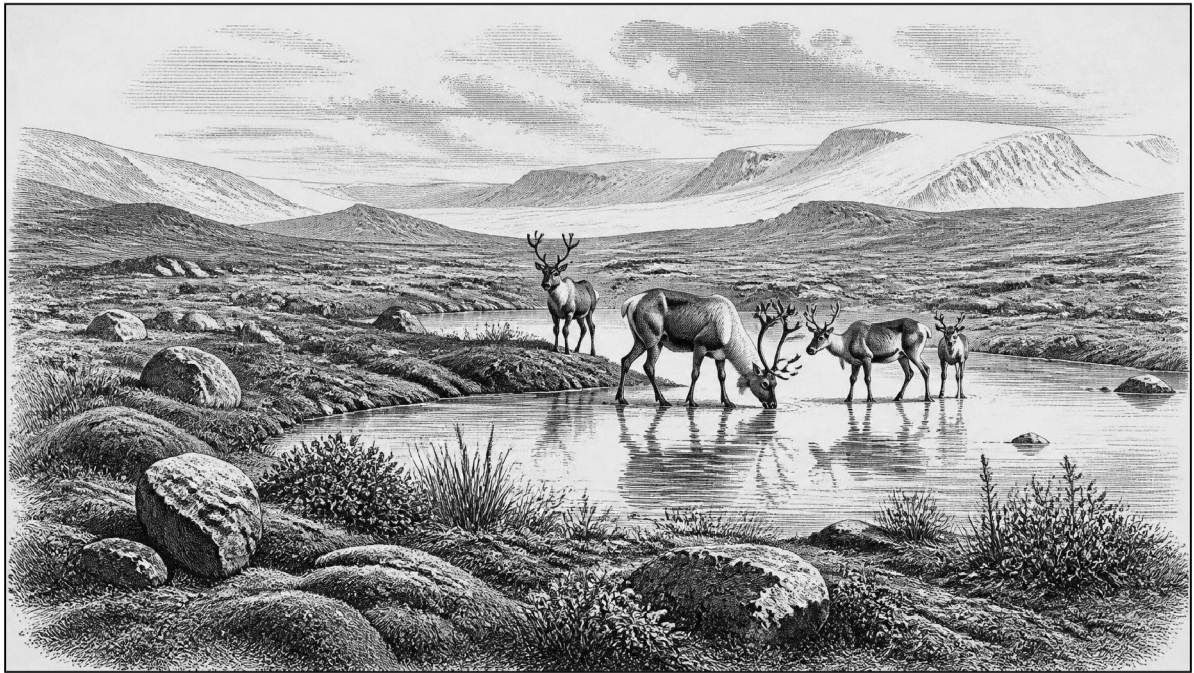
The evidence also changes the meaning of economy and settlement. There is no support for farming, pastoralism, villages or trade in Ireland around this date. The only securely visible economy is the ecological one: plants occupying wet ground, herbivores exploiting open vegetation when conditions allowed, and carnivores moving through wider territories. If people had visited, they would have lived by Upper Palaeolithic hunting and gathering, but that is a statement about contemporary Europe, not a documented Irish society.

Derryvree’s sediments are therefore more than a local curiosity. Sealed between tills, they preserve a rare Irish interval in which water, mosses, sedges and cold-adapted life occupied ground later overridden by ice. Around the chronological point called 31,058 BCE, Ireland’s history is not a story of events and institutions. It is a story of a changing Ice Age landscape, read cautiously from mud, pollen, fossils and the advance of ice.

Chapter 044 of 100

31057 BCE

Hyaena Hall's Mammoth Bones^[44]



“31,057 BCE” is a modern chronological label, not a year for which Ireland preserves an event, a ruler or a contemporary calendar. It is approximately 33,006 years before the conventional radiocarbon reference point of AD 1950, but that arithmetic must not be mistaken for archaeological precision. No available Irish evidence can securely distinguish one year, season or generation at this depth of time. The responsible frame is the later part of Marine Isotope Stage 3 (MIS 3), a climatically unstable interval of the Late Pleistocene, before the Last Glacial Maximum.

For Ireland around this notional date, environmental history is the principal history. Buried sediments, animal bones, pollen, mosses, insects, cave deposits and glacial landforms reveal fragments of an ice-age landscape. They do not yield a political narrative. There are no identifiable communities, leaders, states, wars, treaties, trading institutions, monuments, burials, houses or written traditions that can be placed in 31,057 BCE. The most useful evidence instead comes from two very different archives: an inter-till wetland deposit at Derryvree near Maguiresbridge, County Fermanagh, and the rich but complicated cave-bone assemblage at Castlepook, near Doneraile in County Cork.

A Year Inside a Long Range

The closest chronological anchor is Derryvree. Road works in 1969 cut through a drumlin and exposed freshwater silts, fine sands and organic material lying between two substantial tills: unsorted sediment left by glacier ice. The sequence establishes an important order of events. An earlier ice advance deposited the lower till; at a later time, when that locality was ice-free, standing or slow-moving freshwater accumulated sediment and organic remains; a further glacial advance then covered the deposit with upper till.

Organic material from the freshwater series gave the conventional radiocarbon determination BIRM-166, 30,500 with an uncertainty of $\pm 1,170$ – $1,030$ radiocarbon years BP. Radiocarbon years are not calendar years. Because atmospheric carbon-14 has varied substantially, especially at this antiquity, measurements must be calibrated and produce broad probability ranges rather than an exact historic date. A commonly cited calibrated span for the Derryvree deposit is roughly 36,900–31,700 cal BP, or about 34,950–29,750 BCE. Thus 31,057 BCE falls within a wide environmental horizon potentially illuminated by Derryvree, not at a point that can be isolated within its sediments.

This qualification matters. It would be wrong to write that a particular animal drank at the Derryvree pool, that a group hunted there, or that a glacier advanced in this specific numbered year. What the deposit responsibly shows is that Ireland included at least some ice-free, cold, freshwater landscapes during this broad part of MIS 3. Later ice profoundly altered the island, and the survival of such evidence is exceptional rather than comprehensive.

Derryvree's Open Wetland

The plant and insect evidence from Derryvree points to a treeless, periglacial environment rather than the familiar wooded Ireland of the recent past. Pollen was poorly preserved, but herbaceous taxa dominate the record; macrofossils include numerous mosses. Sedges, grasses, dwarf shrubs and cold-tolerant herbs are more appropriate images than forest. Investigators interpreted the setting as open tundra or muskeg; wet, moss-rich ground with shallow pools and waterlogged patches amid sparse dry-land vegetation.

Such a place was not necessarily lifeless or uniformly snowbound. Seasonal water, plant litter and sheltered hollows could support insects and provide forage for grazing mammals. Yet it was a difficult landscape, shaped by frozen ground, short growing seasons and severe winters. The distinction between a wet hollow and an exposed ridge would have mattered greatly. Local conditions could vary within a few kilometres according to drainage, snow cover, elevation, wind exposure and the proximity of ice.

The Derryvree sequence also prevents a simple picture of a steadily worsening Ice Age. MIS 3 contained sharp climatic fluctuations. Ireland's glaciers and ice caps expanded, retreated or changed their margins on timescales that are long in human terms but brief in geological ones. By the Last Glacial Maximum, later than the period represented here, the British–Irish Ice Sheet reached a far greater extent. At about 31,057 BCE, however, the evidence does not support treating all Ireland as continuously buried beneath a single unchanging ice cover. It instead records a changing mosaic of glacial, periglacial and ice-free terrain.

Castlepook's Animal Archive

Almost 300 kilometres to the south-west, Castlepook Cave preserves Ireland's most important assemblage of vertebrate remains from before the Last Glacial Maximum. Its chambers acquired evocative names during earlier exploration, including Hyaena Hall and Elephant Hall. More than 2,000 bones have been recovered, although much of the material derives from nineteenth- and early twentieth-century investigations whose excavation methods and stratigraphic records do not meet modern standards. Water movement, carnivore activity and earlier digging have further complicated the deposits.

The cave nevertheless demonstrates that a striking range of large and cold-adapted mammals reached Ireland during the wider middle-to-late Ice Age. Its fauna includes woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena; Arctic fox, wolf, mountain hare and lemmings occur among other Irish late-Pleistocene records and cave deposits. The cave should not be read as a single momentary animal

census. Individual bones span long periods, and re-dating has shown that some older radiocarbon assays on Irish cave material were substantially too young. The secure conclusion is regional and chronological: animal communities capable of inhabiting cold, open country were present in Ireland during MIS 3, including phases before the maximum expansion of the last ice sheet.

Spotted hyaena is especially instructive. A cave rich in bones need not have been a human camp or even a place where the animals died naturally. Hyaenas can transport carcass parts, gnaw bone and use sheltered spaces as dens. Carnivore agency, floodwater and collapsing sediment can all combine remains of different animals and ages. That taphonomic warning is central to any account of diet, hunting or settlement. Cave bones provide powerful evidence for fauna, but their original associations must be tested, not assumed.

The Human Question

A reindeer femur from Castlepook has made this interval important for the prehistory of Ireland. It bears a deep linear mark interpreted by the palaeozoologist Ruth Carden as damage made by a sharp stone tool while the bone was fresh, and it has been presented as dating to about 31,000 BCE. If that interpretation and its chronological association are sustained, the object would indicate that people handled and butchered a reindeer in Ireland far earlier than the previously well-established record of post-glacial settlement.

It is, however, evidence for a possible action, not evidence for a resident population. No securely associated hearth, stone-tool assemblage, occupation floor, dwelling, burial, repeated butchered-bone concentration or food store has yet demonstrated an Upper Palaeolithic settlement at Castlepook. Nor can one marked bone identify a language, kin group, migration route, population size or length of stay. Recent excavation has sought intact deposits and better dating, precisely because the old collections and disturbed cave sediments cannot answer every question. The careful formulation is therefore that a brief visit by mobile hunter-gatherers is possible and potentially supported by the bone, but is not yet demonstrated as a settled Irish presence.

If people did reach the island in this broad period, their economy would have been foraging, not farming. They would have depended on locally available animals, plants and materials, moved through a demanding seasonal environment and carried knowledge rather than written records. Yet these are general inferences from Upper Palaeolithic lifeways elsewhere in north-west Europe, not directly documented Irish facts. There is no evidence from Ireland around this date for cultivated crops, livestock, pottery, metal, permanent villages, formal trade networks or social ranks visible through graves and monuments.

No Politics, No Institutions

Political affairs, diplomacy and organised conflict cannot responsibly be reconstructed for Ireland in 31,057 BCE. There were no states or named territories, and no weapons deposits, fortifications or written accounts by which to distinguish warfare from hunting or scavenging. The same limits apply to religion, culture and learning. Ireland has no securely dated cave art, ritual monument, formal cemetery or symbolic assemblage from this precise horizon. Silence in the record does not prove that people, if present, lacked beliefs, stories, teaching or ceremonial practices; it means that the surviving Irish evidence cannot identify them.

Nor can trade be mapped. Materials may have travelled with animals, people, ice or water, but no dated Irish artefact assemblage of this age establishes exchange between communities. The meaningful regional change lies in ecology and geography: repeatedly changing climates altered vegetation, animal ranges, coastlines and routes across the wider Irish Sea world. Ireland was not the familiar temperate island of later millennia. It was a cold, open, environmentally unstable place in which wetlands could form between glacial episodes and mammoths, reindeer and hyaenas belonged to the wider landscape.

What This Date Can Mean

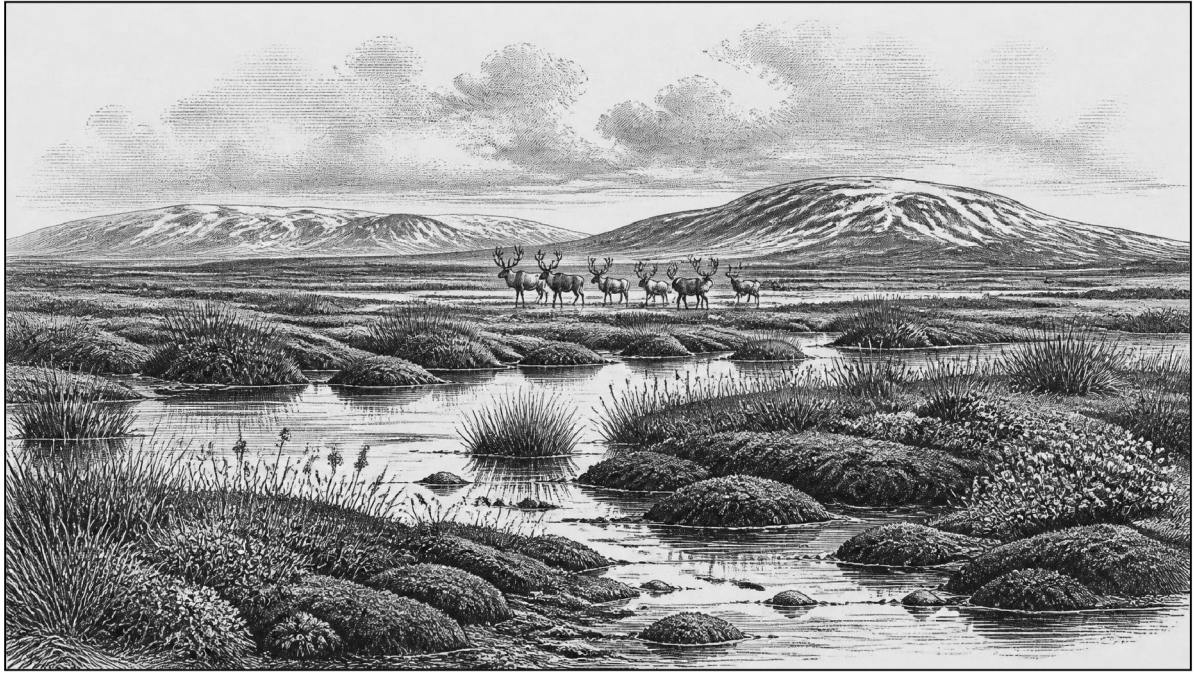
The historical value of 31,057 BCE is therefore not an anniversary of a known Irish occurrence. It is a disciplined point within a much longer interval. Derryvree offers a rare view of an ice-free freshwater tundra landscape trapped between glacier deposits. Castlepook supplies a remarkable, if taphonomically complex, archive of the animals that entered Ireland before the Last Glacial Maximum. The marked reindeer femur poses a serious question about very early human activity, but does not yet permit a conventional story of settlement.

For this deep past, evidence and interpretation must remain distinct. The evidence is sediments, fossils, radiocarbon results and altered bone. The interpretation is a cold, patchy, changing Irish landscape, intermittently available to mammals and perhaps occasionally to people. Modern calendar-year precision is unavailable. What survives is not a chronicle of one year, but a narrow and precious window onto Ireland before renewed ice transformed the country again.

Chapter 045 of 100

31056 BCE

The Doneraile Limb Mark^[45]



31,056 BCE is a modern way of labelling a point far beyond the reach of historical calendars. No event can responsibly be assigned to this particular year in Ireland, and it would be misleading to suggest otherwise. The evidence consists instead of sediments, cave deposits, animal bones and scientific dates with substantial margins of uncertainty. The safest setting is the later part of Marine Isotope Stage 3, before the Last Glacial Maximum: a cold, changeable Ice Age world in which parts of Ireland could support tundra and large mammals, but in which expanding ice would ultimately transform the island.

The most evocative Irish object associated with this broad interval is a reindeer femur from Castlepook Cave near Doneraile, County Cork. It has been presented in heritage publications as dating to about 31,000 BC and as carrying a deep mark made by a sharp stone implement during carcass processing. That claim, if sustained, would indicate a very early human visit to Ireland. It does not, however, provide a dated camp, a named people, or a continuous settlement. The bone comes from an old cave collection with a difficult depositional history, and its wider significance remains dependent on further testing.

Dating a Calendarless Landscape

The numbered year should therefore be treated as a notional waypoint, not a date known to its inhabitants. Radiocarbon laboratories report ages in years before present, where “present” conventionally means 1950; those results then need calibration against changing levels of atmospheric radiocarbon. At great antiquity, a single laboratory result may calibrate to a wide calendar range rather than a precise year. The modern IntCal20 curve reaches back to 55,000 calibrated years before present, but it does not turn an isolated Ice Age specimen into evidence for a single calendar year.

One of the closest environmental records is at Derryvree, near Maguiresbridge in County Fermanagh. There, organic-rich freshwater mud lay between glacial deposits: an earlier ice advance had left till, a period without local ice permitted water and plant remains to accumulate, and a later advance sealed the deposit beneath further sediment. Organic material produced a conventional radiocarbon age of $30,500 \pm 1,100$ BP. Subsequent assessments class this as a low-confidence, pre-Last Glacial Maximum legacy date, but it still demonstrates why year-level certainty is impossible. Its broad calibrated span, approximately 36,900–31,700 cal BP in one published compilation, overlaps the general era represented by this article rather than pinpointing 31,056 BCE.

Wet Ground Between Ice Advances

Derryvree is important because it preserves a local ecological snapshot rather than a human story. Plant macrofossils and spores from the deposit include cold-adapted species such as mountain avens, lesser clubmoss and Irish saxifrage. Taken together, these remains support the interpretation of open, periglacial ground with wet hollows, mosses and freshwater pools: a tundra or muskeg-like mosaic, not the wooded Ireland familiar today. Such vegetation could provide forage for herbivores and cover for smaller animals, while shallow water and saturated sediment preserved fragments of the environment that would otherwise have vanished.

This was not a stable wilderness suspended outside time. Ice-sheet reconstructions show that the British–Irish Ice Sheet changed rapidly over the later glacial period. Its greatest extent is generally placed later, around 26,000–21,000 years ago, though the pace, thickness and precise limits of Irish ice remain debated region by region. By about 31,000 BCE, the relevant development was not necessarily ice covering every part of Ireland, but a deteriorating climatic regime in which habitable zones could contract, ice margins could advance, and routes used by animals could be broken or erased. Later ice movement also destroyed or disturbed much of the evidence that a short human visit might have left behind.

Castlepook's Animal Archive

Castlepook Cave provides a complementary, though equally complicated, record. The limestone cave system was explored mainly in the late nineteenth and early twentieth centuries, long before modern excavation methods. Its chambers acquired memorable names including Hyaena Hall, Elephant Hall and the Gallery of Aged Carnivores. The cave yielded a remarkable Ice Age fauna: woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. The list should not be read as a census of animals standing together in one season. Bones accumulated over long periods through natural deaths, carnivore activity, water movement and earlier excavation, then were re-sorted in places.

Even so, the fauna establishes an important reality. Ireland was not uniformly lifeless before the last great expansion of ice. Reindeer and other cold-environment animals reached the island during parts of the Late Pleistocene, probably when changing sea levels and geography made movement from Britain and continental Europe possible. Direct dating of Castlepook material has shown that some earlier determinations were too young, owing to limitations in older bone pretreatment; revised work places part of the assemblage securely within Marine Isotope Stage 3. That revision matters because it makes the cave a stronger archive for the environmental setting of the period, while also reminding us that scientific chronologies can change.

The Reindeer Femur

The femur is more consequential than the rest of the animal assemblage because it raises the possibility of people. A deep linear modification on the bone has been interpreted by zooarchaeologist Ruth Carden as a fresh-bone cut or chop made with a sharp stone tool. If that interpretation is correct, somebody handled a reindeer carcass in Ireland during the Upper Palaeolithic. It would be evidence of butchery or dismemberment, not necessarily of a successful hunt: people could have killed the animal, encountered a carcass, removed meat, cut hide or sinew, or broken down a limb elsewhere before the remains entered the cave.

The qualifications are essential. No associated stone tools, hearth, occupation surface, human remains or securely excavated food debris have yet been found at Castlepook to demonstrate a camp. Nor does the old collection allow researchers to prove that the mark was made in the cave, rather than before a carnivore or water carried the bone there. The date of the animal is not automatically the date of the modification. A 2022 excavation was undertaken specifically to seek better contextual evidence, illustrating that Castlepook is an active research question rather than a settled foundation for a detailed narrative of Ice Age society.

People, Politics and Daily Life

Accordingly, there is no evidence for political affairs, rulers, territories, diplomacy, warfare, religion, language, art, formal learning or trade in Ireland at this point. There are no Irish houses, graves, monuments, boats or toolkits that can be securely attributed to 31,056 BCE. It is equally unwarranted to project later Celtic identities, medieval origin traditions, or even the well-documented Mesolithic communities of much later millennia back into this landscape.

If people did visit, the best comparison is with small, mobile Upper Palaeolithic hunting groups known elsewhere in north-west Europe. Their practical knowledge may have included animal movement, seasonal weather, stone tools and the use of animal materials. But that is interpretation from a broader European context, not direct evidence for an Irish social group. A reindeer bone with a possible tool mark can support only a narrow conclusion: a brief human encounter with an animal may have occurred. It cannot establish population size, family structure, gender roles, belief or political organisation.

Nor can continuity be assumed. The later growth of the Irish Ice Sheet was a severe ecological interruption. Faunal populations disappeared or were displaced, and any fleeting human presence would have left little chance of a continuous archaeological record. The securely dated terminal Pleistocene evidence from Alice and Gwendoline Cave in County Clare is far younger, dating to roughly 12,810–12,590 cal BP, and is not proof of an unbroken population extending back to Castlepook.

An Ireland Defined by Evidence

The best account of Ireland around this nominal date is therefore one of environmental possibility and archaeological restraint. Wet, open Fermanagh ground preserved a cold-climate plant record between episodes of glaciation. Caves in north Cork accumulated bones from a varied Ice Age fauna. One marked reindeer femur may record human processing of a carcass. These are significant discoveries precisely because they are few, fragile and testable. They reveal an Ireland connected to the wider Pleistocene world of tundra animals and climatic upheaval, while leaving the political and cultural history of any visitors almost entirely unknown.

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31055 BCE

Derryvree's Enclosed Wetland ^[46]



31,055 BCE is a modern chronological label, not a recoverable year in Ireland's prehistoric record. No community on the island kept a calendar that can be correlated with it, and neither radiocarbon dating nor glacial stratigraphy can identify an event, season or person in one particular year so far back. In calendar arithmetic it falls roughly 33,000 years before AD 1950, within the later part of the Last Glacial Period. The responsible history of Ireland at this point is therefore a history of dated ranges, sediments, animal remains and uncertainty rather than rulers, battles or foundations.

The closest Irish environmental archive is at Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed a remarkable sequence inside a drumlin: an older glacial till, then freshwater silts and fine sands containing organic material, then a later till. The buried wetland proves that this particular place was ice-free long enough for water, sediment, plants and small animals to establish themselves between episodes of glaciation. A conventional radiocarbon measurement, BIRM-166, returned 30,500 radiocarbon years BP, with a large published uncertainty of +1,170/-1,030 years. Calibrated estimates have placed the deposit broadly around 36,900–31,700 cal BP. The notional year 31,055 BCE lies within that broad range, but it cannot be made to represent a single layer or moment in the deposit.

A Landscape Between Glaciers

Derryvree belongs to a climatically unstable interval generally discussed within Marine Isotope Stage 3, a long phase of the Late Pleistocene when the climate repeatedly shifted but had not yet reached the full severity of the Last Glacial Maximum. The evidence from the inter-till deposits indicates a cold, open and wet environment, not a temperate woodland. Mosses, sedges, grasses, herbs, dwarf shrubs and aquatic plants point to tundra or muskeg-like ground, with shallow pools, saturated soils and freshwater channels.

In this kind of landscape, the apparent emptiness of a treeless horizon should not be mistaken for lifelessness: wetland vegetation, insects and small animals could exploit sheltered, waterlogged niches even in a harsh continental climate.

That is evidence for one Fermanagh locality, not a precise map of the whole island. Ireland's relief, rainfall, exposure to Atlantic weather, and the changing extent of ice would have created local variation. The modern reconstruction of the British–Irish Ice Sheet also cautions against a simple image of an island either wholly white or wholly green. Its detailed chronology begins at 31,000 years BP, approximately 29,050 BCE, and depicts ice growing on uplands in northern Ireland and elsewhere. That valuable model is later than the requested label and has its own spatial uncertainties. It nonetheless makes the wider trajectory clear: the favourable window represented at Derryvree belonged to a world in which ice was becoming more important, not retreating for good.

Within several millennia, the ice sheet would expand across Ireland and its surrounding shelf, profoundly reworking older land surfaces. The Last Glacial Maximum is usually placed broadly between about 27,000 and 23,000 cal BP in the Irish sector, with maximum British–Irish Ice Sheet volume reconstructed around 23,000 years BP. Glacial erosion, deposition and later rising seas help explain why evidence from earlier human visits is so sparse. The scarcity is meaningful, but it is not proof that no one ever reached Ireland: some sites may have been destroyed, deeply buried, or now lie beneath the sea.

Castlepook and the Human Question

The major question for Irish history at this depth of time comes from Castlepook Cave, near Doneraile in north County Cork. The cave has produced the country's richest known collection of pre-Last Glacial Maximum mammal remains. Its fauna includes woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, Arctic fox, wild horse, mountain hare and lemmings. The assemblage is not the refuse of one camp or one season. It accumulated through a mixture of carnivore activity, natural deaths, sediment movement and antiquarian excavation; modern redating has also shown that some earlier radiocarbon determinations had underestimated the age of Castlepook material.

A reindeer femur in the historic collection is especially important. It has been reported as directly dated to about 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as having been made while fresh bone was cut or chopped with a stone tool. If that interpretation is upheld, it is evidence that a person handled a reindeer carcass in Ireland during the Upper Palaeolithic, far earlier than the previously secure Irish human record. It would fit a broad period rather than the exact year 31,055 BCE. Radiocarbon dates the animal's death, while identifying the mark and establishing its relationship to carcass processing are separate taphonomic judgements.

The limits are as important as the possibility. Castlepook has not yielded a securely associated stone-tool assemblage, hearth, dwelling floor, burial, human remains or repeated occupation surface of comparable age. Nor does the femur establish where the animal was killed, how many people were present, whether they slept in the cave, or whether visits were regular. The most defensible formulation is therefore *possible human activity or carcass processing*, not a settled Palaeolithic population. The better-attested butchered bear bone from Alice and Gwendoline Cave, County Clare, belongs much later, around 12,810–12,590 cal BP, and cannot fill this earlier gap.

Animals, Mobility and Subsistence

Even without a confirmed camp, Castlepook's fauna reveals an Irish landscape that could sustain large grazing mammals and their predators. Reindeer are strongly associated with open, cold-country habitats and seasonal movement; mammoths, hyaenas and lemmings add to the picture of a very different ecological community from modern Ireland's. These species should not be imagined as forming a timeless herd in one place. Individual specimens may differ considerably in age, and caves collect bones across long intervals. Still, their presence shows that northern European cold-stage fauna reached Ireland before the main ice-sheet advance.

If people did visit, they would probably have travelled in small, highly mobile hunting groups and relied on intimate knowledge of animal behaviour, weather, fuel, stone and shelter. That is an inference from Upper Palaeolithic lifeways elsewhere in north-west Europe, not a fact demonstrated by an Irish house or toolkit. A reindeer carcass could have supplied meat, marrow, hide, sinew and bone, but no Irish evidence allows us to reconstruct diet, clothing or hunting methods for this episode. There is likewise no basis for asserting farming, permanent villages, crop cultivation, livestock, pottery or long-distance exchange networks. Such developments belong to vastly later chapters of Irish prehistory.

The geography of approach is also uncertain. Sea level was much lower than today and broad areas of the present continental shelf were dry land or altered coastal terrain, while glaciers and meltwater changed possible routes. Models indicate that Britain and Ireland had land connections at parts of the Last Glacial Maximum, but the exact nature, timing and passability of routes around 33,000 cal BP remain debated. A human arrival need not imply a simple walk across a stable bridge; ice margins, waterways, exposed plains and changing coastlines all mattered. The reindeer itself demonstrates animal movement into Ireland, but does not prescribe the route used by people.

No Politics, No Proven Ritual

There is no evidence for political authority, territorial states, diplomacy, organised warfare or identifiable communities in Ireland at this horizon. It would be misleading to turn a possible butchery mark into a tribal history. Small mobile groups elsewhere certainly depended on co-operation, shared skills, kinship and the transmission of knowledge, but Irish evidence cannot identify their language, beliefs, social rules or artistic traditions. Nor does the presence of bones in a cave establish ritual use. Caves could act as carnivore dens, natural traps, shelters, sediment basins and excavation sites; their later spiritual significance elsewhere cannot be projected backwards without material support.

Culture and learning survive here only indirectly, in the possibility that a shaped stone edge was used skilfully on fresh bone, and in the ecological knowledge required by any successful visitor. Economy, if humans were present, would have centred on immediate subsistence rather than markets or trade: obtaining food and usable animal materials in an exposed, seasonal landscape. The primary historical development was environmental. Wetlands like Derryvree existed in an interval of local ice-free ground, while the wider climatic system was moving towards greater glaciation and the eventual erasure or burial of many older traces.

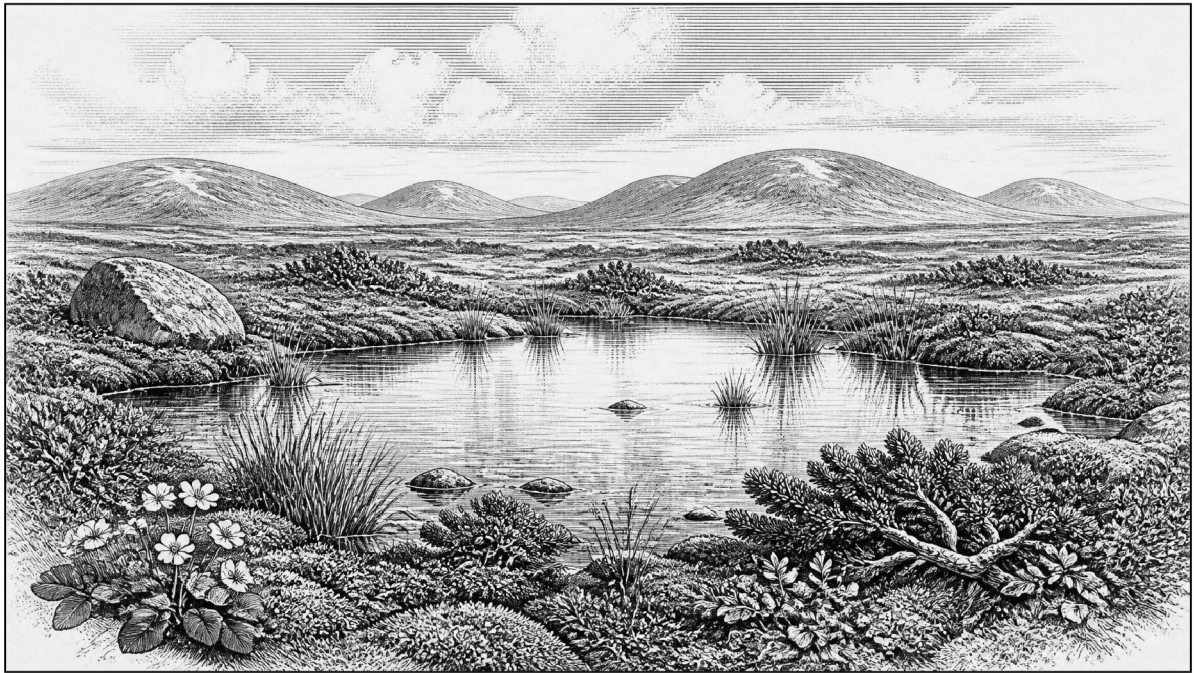
An Archive of Limits

Ireland around the modern label 31,055 BCE was neither a known empty wilderness nor a documented homeland. Derryvree provides firm local evidence for cold freshwater habitats between glacial episodes; Castlepook provides firm evidence for a striking cold-stage fauna and a tantalising, but contextually limited, claim for human butchery. Together they replace an older assumption of uninterrupted ice cover or total archaeological silence with a more careful picture: an environmentally varied, vulnerable land on Europe's north-western edge, capable of supporting animals and perhaps brief human forays before expanding ice transformed it. The date remains calendarless, but the sediments and bones give it a real, if fragmentary, Irish setting.

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31054 BCE

Fermanagh's Tundra Pool^[47]



Modern calendar-year precision is not available for Ireland in 31,054 BCE. This label is a modern conversion, roughly 33,004 years before AD 1950, rather than a date that any contemporary person could have named or recorded. It belongs to the Late Pleistocene, within Marine Isotope Stage 3, long before writing, agriculture, permanent villages, states or an Irish political community. The responsible history of this point in time must therefore be built from buried sediments, fossil plants, insects and animal bones, dated in wide ranges rather than assigned to a particular season or year.

The most relevant evidence is not a settlement site but a sealed freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed fine sands, silts and organic material between two separate tills: unsorted sediments left by glacier ice. The sequence is exceptionally important. It demonstrates that, at this locality, an ice-free interval separated two episodes of glacial occupation. It does not, however, provide an annual diary of Irish life.

A Date Within a Range

Organic material from Derryvree produced the conventional radiocarbon determination BIRM-166, approximately 30,500 radiocarbon years before present, with a substantial uncertainty. Radiocarbon years are not identical to calendar years. Calibration against modern curves converts such an early measurement into a broad and uneven span of possible calendar ages, conventionally represented at several millennia in width. Published discussions commonly place the Derryvree deposit broadly in the later part of Marine Isotope Stage 3, around the mid-thirties to low-thirties thousands of calibrated years before present.

Thus 31,054 BCE falls within the wider chronological horizon that Derryvree can responsibly illuminate, but it cannot be shown to be the precise year in which its mosses grew or its pond lay open. Nor should one deposit in Fermanagh be projected uncritically across the whole landmass that later

became Ireland. Glaciers, watercourses, relief and local exposure created sharply varied conditions. The strength of Derryvree lies in its sequence: ice, then wetland sediment, then renewed ice. Its weakness, inevitable at this depth in time, is chronological and geographical resolution.

Wetland in a Treeless Country

The plant and insect evidence indicates an open, treeless tundra or muskeg environment around the Derryvree basin. Grasses, sedges, herbs, juniper, mosses and cold-adapted plants occur in the record. Plant macrofossils include mountain-avens, dwarf willow and bogbean, the last a plant associated with shallow freshwater and wet ground. Insect remains reinforce the picture of wet, organic-rich ground with pools and mossy margins. This was not a featureless white desert. Even under severe climatic conditions, shallow water, saturated sediment and low vegetation could support distinctive ecological communities.

That description needs limits. Fossils recovered from a pool register what entered or grew within a particular catchment; they do not map every hill, coast and valley. Yet the evidence firmly rules out the familiar later image of a wooded Ireland. Forest cover was absent at Derryvree. Winters were harsh, summers short, and the growing season constrained. Wind, frost action and seasonal thaw would have shaped exposed ground. The organic bed also records a landscape sufficiently stable, for a time, to allow freshwater sediment and plant matter to accumulate before later ice overrode and buried it.

Environmental change was the commanding historical force. At this date Ireland was approaching the colder conditions that would culminate in the Last Glacial Maximum, conventionally dated to about 26,000–20,000 years before present. The maximum lay in the future of 31,054 BCE, but ice-sheet growth was already part of the wider north-west European setting. Later ice greatly eroded and rearranged older deposits, which explains both the rarity and the value of surviving Middle Midlandian evidence.

Animals on the Southern Karst

County Cork offers a different, though equally fragmentary, archive. Castlepook Cave, also called Mammoth Cave, near Doneraile yielded bones of large and small mammals from deposits investigated chiefly in the early twentieth century and later reassessed through radiocarbon dating. The assemblage includes woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. Not every specimen belongs to one moment: cave deposits can be disturbed, bones may be moved, and the fauna accumulated across a long period. Still, the collection establishes that pre-maximum-glaciation Ireland could support, or at least receive, a much richer cold-stage mammal fauna than the island possesses today.

Spotted hyaenas are especially revealing. Their remains and those of other carnivores indicate that caves were not passive storehouses but places into which bones could be dragged, gnawed or scattered. A mammoth bone bearing marks consistent with hyaena feeding illustrates this process. Reindeer and giant deer attest to open-country herbivore communities; wolves and hyaenas point to predation and scavenging. Such animals were participants in an ecological system, not evidence for a human hunting camp.

Low global sea levels and the presence of these mammals show that Ireland was not always as ecologically isolated as the modern island. Faunal movement from Britain and ultimately continental Europe occurred during favourable windows in the wider 45,000–20,000-years-ago interval. Precisely

how routes changed through time remains difficult to reconstruct. Animal bones demonstrate connectivity over long periods; they do not prove that a particular herd crossed in 31,054 BCE, nor do they establish a simple, continuously dry land bridge at this exact date.

The Human Question

A reindeer femur from Castlepook has been reported to bear a deep linear mark interpreted as damage from a sharp stone tool, and its reported antiquity has made it central to arguments for Upper Palaeolithic human activity in Ireland around 33,000 years ago. If that interpretation is confirmed, it would show that a person handled, and perhaps processed, a reindeer carcass during this broad period. It would be an important revision to the former view that no human trace in Ireland pre-dated the end of the last glaciation.

But the evidence must not be made to say more than it can. A date on a bone establishes when the animal lived, not automatically when any surface modification was made. Castlepook has no securely associated hearth, stone-tool assemblage, dwelling surface, burial, human skeleton or repeatedly used food-processing area of comparable age. Older cave excavations also left complex collections whose original layers cannot always be reconstructed. The cautious conclusion is that a possible human trace exists, not that Ireland possessed a demonstrable resident population, named culture or permanent settlement in 31,054 BCE.

This distinction matters for everyday life. If people did reach Ireland in this interval, their nearest archaeological parallels would be highly mobile Upper Palaeolithic hunter-gatherers elsewhere in north-west Europe. They may have possessed sophisticated knowledge of animal movements, stone technology, clothing and social exchange. Yet none of those practices has been directly recovered from an Irish site of this age. They are regional comparisons, not evidence of an Irish camp. It is unsound to invent houses, boats, hunting parties, languages or kin groups for Derryvree or Castlepook.

No Politics, No Diplomacy

There is no evidence for political affairs, warfare, diplomacy, formal leadership, religion, trade or learning in Ireland at this date. There were no known farms, fields, monuments, mines, markets or institutions. Neither can the evidence establish ownership of land or organised conflict between communities. The movement of animals and any possible human visitors may imply wider ecological and social connections beyond Ireland, but it does not document exchange relationships.

Culture is visible instead in the modern work of reconstruction: geological mapping, pollen analysis, palaeoentomology, zooarchaeology and increasingly careful radiocarbon reassessment. These methods turn a road cutting in Fermanagh and old cave collections in Cork into evidence for a changing Ice Age world. They also teach restraint. Ireland in 31,054 BCE was not yet a historical society in the usual sense. It was a cold, open and unstable landscape, with freshwater refuges in some places and a varied mammal community in others, poised within the long climatic deterioration before the Last Glacial Maximum.

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31053 BCE

Mammoth Cave's Reindeer Question^[48]



The label *31,053 BCE* suggests the precision of an annal, but no Irish annal, calendar, named person or dated event exists for this depth of time. It is better understood as a modern point placed within the later Pleistocene, roughly 33,000 calendar years before the archaeological present of AD 1950. Evidence can illuminate broad intervals, not this individual year. The relevant archaeological setting is Marine Isotope Stage 3, part of the last glacial cycle, when Ireland's climate, ice cover, coastlines and animal communities changed repeatedly over millennia.

For Ireland, the responsible history of this period is therefore one of deposits, bones and landscapes rather than rulers or settlements. Two especially important bodies of evidence frame the picture: the buried freshwater sediments at Derryvree near Maguiresbridge in County Fermanagh, and the rich cave fauna of Castlepook, or Mammoth Cave, near Doneraile in north County Cork. Neither is a diary of 31,053 BCE. Together, however, they show that parts of Ireland could sustain cold-adapted life before the fullest expansion of the last ice sheet, and they raise—without finally answering—a remarkable question about very early human activity.

A Date Without Calendar Precision

Radiocarbon dates are not historical dates in the familiar sense. A laboratory measurement gives an age in radiocarbon years before present, conventionally before AD 1950. Because the amount of radioactive carbon in the atmosphere has altered through time, that measurement must be calibrated against independently dated natural records. At around 30,000 radiocarbon years ago, the resulting calendar range is necessarily broad. A determination from one sample may cover centuries or several millennia at high probability; it cannot identify a particular season, generation or numbered BCE year.

This distinction is essential at Derryvree. Roadworks in 1969 cut through a drumlin and revealed silts, fine sands and organic layers enclosed between two tills—stony sediments left by glacier ice. Organic material from the freshwater deposit returned a conventional radiocarbon age of 30,500 $\pm$ 1,170/–1,030 BP. Modern calibration places such a result within a wide later-MIS-3 span, approximately c. 37,000–32,000 calibrated years BP, depending on the calibration method and confidence range used. The requested date lies broadly within that span, but it cannot be pinned to a particular plant, insect, episode of sedimentation or state of the weather at Derryvree.

Derryvree's Cold Freshwater World

What Derryvree does demonstrate is unusually valuable. Between episodes of glaciation, a freshwater or wetland environment existed in what is now south Fermanagh. Its organic-rich layers contained freshwater mosses and sedges, while insect evidence indicated cold northern conditions. Earlier study also recovered pollen and plant macrofossils consistent with sparse, open, treeless vegetation. This was not the wooded Ireland familiar from later prehistory or from the modern island. It was a periglacial landscape: cold, exposed and structured by frost, shallow water, seasonal thaw and low-growing plant communities.

That conclusion should not be exaggerated into a national reconstruction. Derryvree is a local archive preserved beneath later glacial deposits, not a complete map of Ireland. The wetland tells us that this locality was not under overriding glacier ice while its organic mud accumulated. It does not prove that every Irish valley was ice-free at the same moment, that every coast had the same vegetation, or that the island's present drainage pattern existed. Nor does it provide evidence for fields, livestock, dwellings or people. Its importance is ecological: it preserves a glimpse of the living communities that could occupy a cold Irish lowland during an unstable glacial interval.

In everyday terms, the scene was one of limited biological productivity but not lifelessness. Sedges and mosses could occupy saturated ground; hardy herbs grew in open patches; insects survived in and around the water. Winters were severe and summers short by later Irish standards. Local pools, streams and wet ground would have been important refuges for plants and small animals. The evidence is strongest for the wetland itself and its immediate surroundings. Any description of distant hills, coastlines or seasonal animal movements remains interpretation, informed by comparable north-west European environments rather than directly observed at Derryvree.

Ice in Motion, Not a Frozen Island

At this timescale, it is misleading to imagine either a wholly green Ireland or an island uniformly entombed beneath ice. Recent reconstructions of the British–Irish Ice Sheet stress that its growth was regionally uneven and often rapid. Ice expanded in the wider archipelago during the closing part of MIS 3, while a large Irish ice cap developed in northern uplands; the eventual maximum extent came later and was asynchronous from one sector to another. The last glacial maximum is generally placed much later than the Derryvree interval, broadly within c. 28,200–20,400 calibrated years BP.

Thus the most defensible picture around 31,053 BCE is one of regional change. Some Irish uplands may have supported substantial ice, while other places retained exposed ground, watercourses and habitats capable of supporting tundra or steppe-tundra life. Lower sea levels altered the surrounding shelves and made Ireland less geographically isolated than it is now, although the exact configuration of land, sea and

possible routes changed through time. A lower sea level does not itself demonstrate an easy land crossing for people or animals at any particular date. It simply reminds us that modern coastlines are a poor guide to the geography of the Ice Age.

Castlepook's Faunal Archive

Castlepook Cave provides the best-known Irish animal record relevant to this broad horizon. The limestone cave system near Doneraile was excavated principally in the early twentieth century, long before modern excavation standards, and later work has reassessed both its collections and chronology. More than 2,000 bones have been recovered. Direct dating and re-dating show that the assemblage accumulated over a long period, rather than in one occupation episode. Geological Survey Ireland describes dates for individual bones spanning roughly 45,700 to 19,950 years BP. It follows that its contents cannot be treated as a single community living together in 31,053 BCE.

Even so, the range of animals is striking. Castlepook has produced remains of woolly mammoth, giant deer, reindeer, brown bear, wolf, Arctic fox, spotted hyaena and lemmings. These finds establish that Ireland formed part of a wider north-west European world in which large herbivores and cold-adapted carnivores entered or occupied suitable areas during the last glacial cycle. They also help explain the character of the open landscapes indicated by Derryvree: there was enough forage, cover and water in some places to support substantial mammals, alongside predators and scavengers.

The cave itself was not necessarily a place where those animals died naturally. Carnivores could drag carcass parts into chambers; water and sediment movement could redistribute bones; early excavations could disturb layers and associations. Spotted hyaenas are particularly relevant because their presence offers a plausible mechanism for gathering and modifying bones in a den. Consequently, a mammoth rib, reindeer limb or hyaena tooth proves the presence of an animal or its remains at the cave, but not the precise season of death, the composition of a local herd, or a human hunting event. This taphonomic caution is not a limitation to be hidden: it is central to reading cave evidence honestly.

The Reindeer Femur and Human Possibility

The most provocative object associated with this date is a reindeer femur from Castlepook. It has been presented as approximately 33,000 years old and as bearing a deep linear mark interpreted by zooarchaeologist Ruth Carden as having been made on fresh bone with a sharp stone tool. County Cork's heritage publication describes the mark as evidence consistent with butchery; if that interpretation is confirmed, it would suggest that a person processed a reindeer in Ireland far earlier than the previously secure Late Upper Palaeolithic evidence.

That possibility is historically important, but it must remain conditional. A radiocarbon date establishes the age of the animal bone, not automatically the exact moment when a surface mark was made. Identifying a cut or chop mark requires microscopic and taphonomic assessment, especially in a collection affected by carnivores, water and antiquarian excavation. Nor has Castlepook yielded a securely associated stone-tool assemblage, hearth, dwelling floor, burial or repeatedly occupied camp of this age. Recent excavation has sought surviving sediments and faunal material, but the site cannot yet be described as a demonstrated Palaeolithic settlement.

There is therefore no responsible basis for narrating a hunt, naming a group, assigning a language or describing a permanent population in Ireland in 31,053 BCE. If people were present, the evidence presently fits no more than a brief and small-scale visit, perhaps linked to carcass processing or movement

through a cold landscape. Even that is an interpretation, not a proven event. The securely dated cut-marked brown-bear bone from Alice and Gwendoline Cave in County Clare is much later, dating to c. 12,810–12,590 calibrated years BP. It remains vital as a benchmark for the evidence needed to demonstrate Palaeolithic human action clearly.

No Politics, but an Ecological Frontier

Political affairs, diplomacy, organised warfare, religion, trade and formal learning cannot be recovered for Ireland at this date. There are no known institutions, monuments, graves, artworks, toolkits or settlement plans from which to infer them. Nor should the absence of evidence be filled with imagined tribes, shamans or territorial kingdoms. Society, if any humans reached the island, is archaeologically invisible beyond the contested implication of one modified bone.

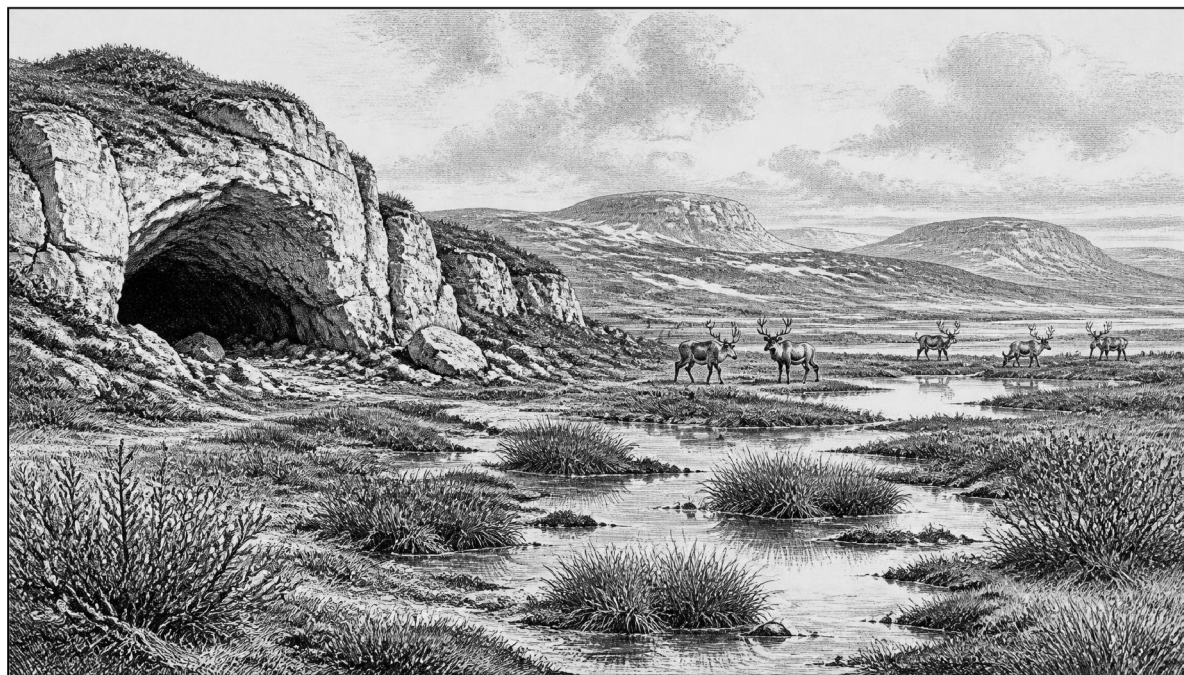
The most meaningful “politics” of the period was ecological rather than governmental: access to shelter, unfrozen water, game, routes across changing ground and safety from large carnivores. The economy recorded at Castlepook is an animal economy, not a human one—predation, scavenging and the circulation of bones through caves. The culture and learning visible to modern researchers belong chiefly to the investigators who recover, date and reinterpret these fragile remains. Their work has changed the question from whether Ice Age Ireland had life to how, when and where that life endured.

For 31,053 BCE, then, Ireland’s year-by-year record must remain deliberately modest. Derryvree gives firm evidence of a cold freshwater wetland between glacial advances. Castlepook gives firm evidence of an Ice Age fauna and a tantalising, still unproven indication of human butchery. These traces reveal a changing, inhabited landscape of mosses, sedges, reindeer and predators—not an Irish society that can yet be described in historical detail. The uncertainty is not empty space: it is the real boundary of the evidence.

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31052 BCE

Cork's Reindeer Hinterland^[49]



31,052 BCE is not a date that can be treated as a recorded Irish year. No written chronicle, settlement sequence or securely dated event allows historians to identify what happened in Ireland in that particular twelve-month span. The number is a modern calendrical label applied to a remote part of the Late Pleistocene. At this depth of time, archaeological and environmental evidence is normally expressed through radiocarbon determinations, calibrated ranges, stratigraphy and broad climatic phases. Even the conversion of a radiocarbon age into a BCE date involves modelling and substantial uncertainty. The responsible question is therefore not “what happened in Ireland in 31,052 BCE?”, but what conditions and evidence illuminate Ireland in the broad interval around 33,000 calendar years before present.

That interval belongs to the later part of Marine Isotope Stage 3, within the Midlandian glaciation of Ireland. It preceded the Last Glacial Maximum, when the Irish Ice Sheet expanded across most of the island. Ireland was not a timeless white desert: its landscapes changed sharply as climate oscillated, ice margins advanced or retreated, sea levels fell and plants and animals responded. Yet neither was it the familiar green, wooded island of later prehistory. The evidence points instead to a cold, open and unstable north-west European landscape, containing habitable patches but increasingly subject to the approach of major glaciation.

Dating a Landscape, Not a Year

The distinction between radiocarbon and calendar time matters especially here. Conventional radiocarbon ages are measured in years “before present”, where present is defined as AD 1950, but atmospheric carbon-14 has varied through time. Dates must therefore be calibrated against internationally maintained curves. At roughly thirty-three millennia ago, calibration is less precise than for more recent

millennia and often produces wide ranges. A label such as 31,052 BCE should consequently be read as a convenient point within a long prehistoric window, not as a date to which an Irish bone, lake bed or human visit can be pinned.

The island's evidence is also geographically uneven. Cave deposits in Munster preserve animal remains; buried sediments in Fermanagh preserve plants, insects and freshwater conditions; glacial landforms on land and the continental shelf record later ice movement. These archives do not amount to a single continuous national history. Some were excavated in the nineteenth and early twentieth centuries, before modern recovery methods and recording standards. Bone collections may include material shifted by carnivores, water, excavation or later disturbance. Recent redating has shown why old determinations must be checked rather than repeated uncritically.

Reindeer and Hyenas in North Cork

The most vivid evidence relevant to this period comes from Castlepook Cave, near Doneraile in north County Cork, also known as Mammoth Cave. It is Ireland's richest known Pleistocene vertebrate site. Its collections include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyena. This is powerful evidence that, at various times during the Late Pleistocene, Ireland supported a diverse cold-climate fauna. It is not proof that every one of those animals stood together outside the cave in the same season, let alone in 31,052 BCE. The deposits accumulated across a long and complex span.

Recent reassessment of southern Irish cave dates has strengthened the case that some Castlepook fauna belongs much earlier in Marine Isotope Stage 3 than older dating programmes suggested. In particular, revised results indicate that giant deer and spotted hyena may have disappeared locally before the Last Glacial Maximum, perhaps by around 40,000 calibrated years before present. That revision is a reminder that the cave's bones are a time-depth archive, not a neatly sealed campsite. Nevertheless, the faunal list reveals the ecological possibilities of pre-maximum Ireland: grazing and browsing animals could enter the island during suitable phases, while large carnivores exploited the same broad environments and caves could become dens or bone accumulations.

A reindeer femur from Castlepook has made this landscape historically consequential. County Cork heritage material identifies a deep mark on the bone as a possible cut made with a sharp stone tool and places the specimen broadly around 31,000 BC. If the mark was made by people while the bone was fresh, it would indicate human activity in Ireland far earlier than the better-established Late Upper Palaeolithic evidence from Alice and Gwendoline Cave in County Clare, where a butchered brown-bear bone dates to approximately 12,810–12,590 calibrated years before present.

That is an important conditional statement, not a licence to populate Ireland with a settled Palaeolithic community. The Castlepook bone is a single specimen from an old cave collection; no associated stone-tool assemblage, hearth, dwelling, burial ground or securely excavated occupation surface has yet demonstrated a resident population at this time. The mark may be highly suggestive of butchery, but the larger context remains unresolved. The most careful conclusion is that brief human presence or visitation in southern Ireland around this broad period is possible and potentially evidenced, while sustained occupation remains unproven.

An Open, Wet Tundra

Fermanagh provides a different kind of evidence. In 1969 roadworks cut through a drumlin at Derryvree, near Maguiresbridge, exposing freshwater silts and fine sands trapped between two tills. The sequence matters as much as its contents: glacier ice deposited one body of till; an interval then permitted standing or slowly moving freshwater, sediment and organic remains to accumulate; later ice sealed the deposit beneath another till. It proves that at least part of Ireland experienced an ice-free interlude between glacial advances.

Organic material from Derryvree produced a conventional radiocarbon age of about 30,500 years BP, with a large error range. It cannot responsibly be translated into one BCE year, and it need not be exactly contemporary with the calendar label used here. It is, however, close enough to illuminate the wider Middle Midlandian world. Pollen, plant macrofossils, mosses and insects point to a treeless, periglacial wetland rather than forest. Sedges, grasses and herbs grew around open water and damp ground; cold-adapted plants included mountain avens, dwarf willow and bogbean. Moss-rich margins, shallow pools and sparse terrestrial vegetation created a mosaic of habitats in an otherwise severe climate.

This was not barren ground. Small invertebrates, wetland plants and grazing opportunities could persist wherever water and summer growth allowed. But productivity was seasonal and exposed to rapid climatic change. Trees were absent locally or extremely scarce. Isolated tree pollen grains do not demonstrate nearby woodland, because pollen can travel long distances. Nor does a rich microscopic assemblage prove a landscape thickly covered by vegetation. The better interpretation is of low, open cover broken by freshwater habitats: a place capable of supporting life, but far removed from the later forests, farms and peatlands of Ireland.

Iceward Change

By this stage, the long-term direction of change was towards more extensive glaciation. The timing, thickness and precise limits of the last Irish Ice Sheet remain subjects of active research, and reconstructions differ by region. Studies of southern coasts, western mountains, offshore landforms and cosmogenic exposure ages have nonetheless transformed the older view of a simple, uniform ice cover. They show an ice sheet that grew and flowed through interacting terrestrial and marine sectors, with local high ground sometimes behaving differently from surrounding lowlands.

The eventual maximum advance is generally placed after this period, broadly between about 27,000 and 23,000 calibrated years before present in major syntheses. Thus the Ireland evoked by the Castlepook fauna and Derryvree wetland belonged to an increasingly precarious pre-maximum world. Later ice would erode, redeposit and conceal many older surfaces, explaining in part why direct evidence is so fragmentary. Caves and buried sediments are precious precisely because they escaped complete destruction or retain material protected beneath glacial deposits.

Lower global sea levels altered coastlines and the shape of the Irish Sea basin, but no securely demonstrated crossing route can be assigned to any possible human visitors. It would be unsafe to speak of an established road, permanent land bridge or routine migration corridor. Animals plainly reached Ireland during parts of the Pleistocene, but the exact combinations of exposed shelf, sea ice, water crossings and temporary connections changed through time. Faunal presence shows dispersal was possible; it does not reveal precisely how, when or how often each species arrived.

Society Without Social Evidence

For an annual history, the most striking fact is what the record does not permit. There is no evidence for Irish polities, leaders, diplomacy, warfare, tribal territories, formal religion, monuments, farming, pottery, metalworking, markets or long-distance trade networks around 31,052 BCE. There are no named people and no basis for reconstructing language, kinship, ritual or learning. Such themes belong to later prehistoric Ireland, where settlements, graves, artefacts and monuments provide appropriate evidence.

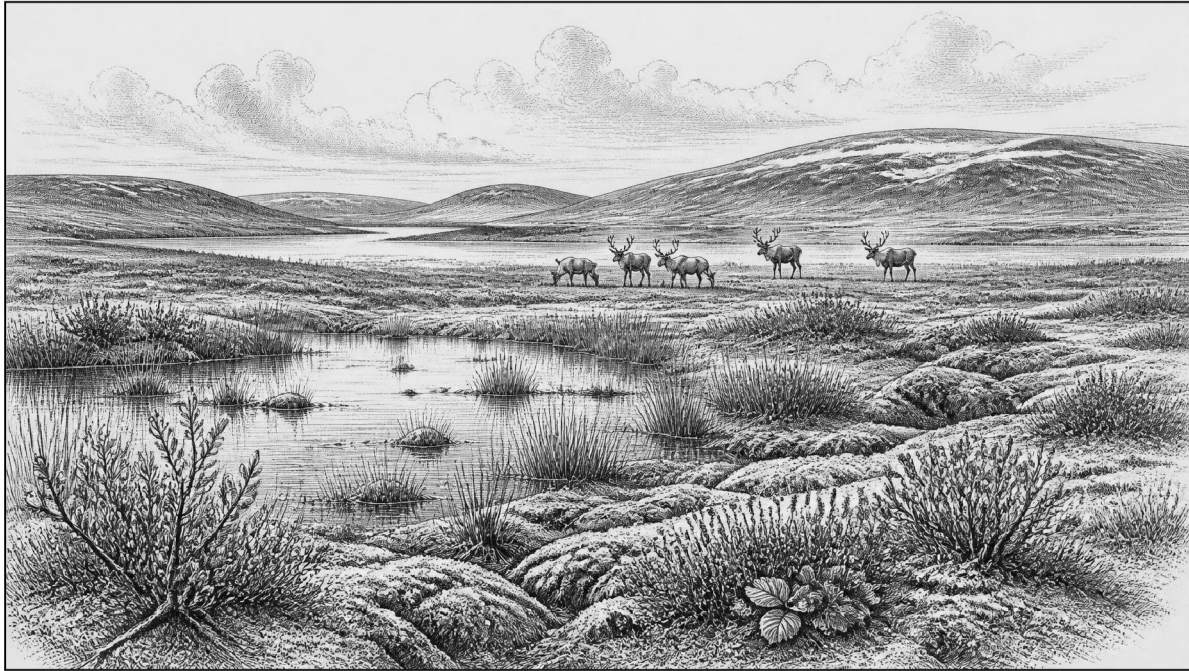
If the Castlepook mark is anthropogenic, the most modest social inference is that one or more highly mobile people possessed a stone cutting edge and had access to a reindeer carcass. Reindeer could yield meat, marrow, hide, sinew, antler and bone, but one cut cannot identify which resource was sought, whether the animal was hunted or scavenged, or whether people themselves entered the cave. Carnivores may have transported remains into the system after human activity elsewhere. Even an authentic butchery mark would describe an encounter, not a village economy.

Culture at this depth is therefore best sought in methods of survival rather than imagined institutions: the movement of animals across open country, the use of sheltered places by predators, the persistence of wetland life and the changing reach of ice. Ireland's human story may have begun in fleeting episodes considerably earlier than once thought, but the archaeological proof is still too thin to turn possibility into a detailed narrative. The central development around this notional year was environmental: an island of cold habitats and mobile fauna, on the threshold of a much harsher glacial phase.

Chapter 050 of 100

31051 BCE

Bogbean at Derryvree ^[50]



Modern calendar-year precision is not available for Ireland in 31,051 BCE. No written record, settlement sequence or scientific dating method can identify an occurrence in that single year. The label is a modern retrospective one: counted from the radiocarbon convention of AD 1950, it falls about 33,001 years before present. The responsible subject is therefore a broad Late Pleistocene interval, not an annual chronicle. Ireland lay within Marine Isotope Stage 3, during the Midlandian cold stage, when climate, ice margins and habitats changed repeatedly over thousands of years.

The closest informative Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater deposits there produced a conventional radiocarbon determination of $30,500 \pm 1,100$ years BP, known as BIRM-166. Radiocarbon ages are not calendar ages: after calibration, the relevant interval has been expressed broadly as c. 36,900–31,700 calibrated years BP. A later regional Bayesian model places the Derryvree ice-free evidence around 33.5 ± 1.2 thousand calibrated years BP. Thus 31,051 BCE sits within the wide chronological horizon illuminated by the deposit, but it cannot be assigned to a particular layer, season, animal or human act.

Fresh Water Between Ice Advances

Derryvree was exposed during roadworks through a drumlin in 1969. The sequence was unusually revealing: a lower bed of till, deposited by glacier ice, was overlain by freshwater silts, fine sands and organic material, which were in turn sealed beneath another till. Its basic history is secure. An earlier ice advance crossed the locality; afterwards, exposed ground and fresh water allowed sediment, plants and small animals to accumulate; a later advance buried the evidence. This is a powerful local record of environmental change, not proof that all Ireland was ice-free at once.

The organic bed is generally associated with the Derryvree Cold Phase, a name used in Irish Quaternary stratigraphy for cold, non-glacial or periglacial conditions during part of MIS 3. “Cold phase” is more accurate than imagining a benign interlude. The landscape around the Fermanagh site was not woodland like later Ireland. Its fossils point instead to an open, treeless wetland mosaic, shaped by prolonged frost, short growing seasons and shallow or slow-moving water. A later ice sheet would substantially remodel the island, but at Derryvree the ground was, for a time, demonstrably available to plants and animals.

The word *muskeg* has sometimes been used for this setting. It should not evoke an unchanging modern bog. Rather, it conveys wet, organic-rich ground, mossy or sedgy margins and small pools amid exposed cold-country vegetation. Fine sediments and organic remains accumulated where water slowed. Nearby ground may have ranged from saturated hollows to sparsely vegetated mineral soil, with frost action disturbing surfaces in winter and snowmelt feeding pools in warmer months.

A Tundra Wetland, Not a Forested Island

Plant and insect evidence provides the sharpest picture of everyday ecology. Derryvree yielded freshwater mosses, sedges and other herbs, alongside species whose modern distributions favour cold northern or Arctic-alpine conditions. Fossil records from the deposit include bogbean (*Menyanthes trifoliata*), alternate water-milfoil (*Myriophyllum alterniflorum*) and dwarf willow (*Salix herbacea*). Together, such remains support the interpretation of open tundra-like vegetation with wet hollows and standing fresh water. They show that even a severe periglacial environment could sustain a varied local plant community.

That evidence must be read carefully. Pollen is readily carried or reworked, and occasional grains from trees do not establish nearby forest. The wider assemblage—herbaceous pollen, mosses, aquatic plants and cold-adapted insects—carries more weight than isolated tree pollen. It supports a largely treeless landscape. No reliable thermometer reading survives from Derryvree, so specific temperatures, snowfall totals and seasonal weather should not be invented. Yet the ecological combination makes severe seasonality and a restricted growing season reasonable interpretations.

The wider island was unlikely to have been uniform. Uplands, Atlantic-facing coasts, sheltered limestone country, inland basins and the Irish Sea region would have responded differently to shifts in temperature, precipitation, sea level and ice extent. The Derryvree section therefore illuminates a Fermanagh locality particularly well. It cannot establish the condition of every Irish region on the same day, decade or even century. Its great value lies in preserving a rare biological archive from a landscape later obscured or destroyed by renewed glaciation.

Reindeer Country in Cork

County Cork offers a different, more fragmentary window. Castlepook Cave, near Doneraile—also known as Mammoth Cave—has produced a remarkable Pleistocene fauna from old excavations and later study. The assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, hares, lemmings and spotted hyaena. It demonstrates that parts of Ireland could support large herbivores and formidable carnivores during changing cold-stage conditions. These animals did not all necessarily occupy the cave or surrounding countryside together: cave deposits may accumulate over long periods, and historic excavations did not always preserve the contextual detail expected today.

Nevertheless, the fauna corrects the misleading image of a wholly lifeless, ice-bound island. Reindeer imply open grazing country; mammoths and giant deer point to substantial terrestrial productivity at least during favourable intervals; hyaenas, wolves and bears belonged to food webs in which carcasses could be moved, scavenged and accumulated in caves. A cave bone is not automatically evidence that an animal died nearby. Predators, scavengers, water movement and human collectors can all alter the route by which remains enter a deposit. The cave is therefore a record of animal presence and ecological possibility, not a complete census of a single landscape.

The Human Question

Castlepook also raises Ireland's most important, and most cautious, human question for this broad period. A reindeer femur from the cave has a mark interpreted by zooarchaeologist Ruth Carden as damage made by a sharp stone tool while a fresh carcass was processed. If that interpretation and its chronological association are sustained, it would indicate human activity in Ireland around 33,000 years ago—far earlier than the long-established Late Upper Palaeolithic evidence from Alice and Gwendoline Cave in County Clare.

But one marked bone cannot demonstrate a permanent population, a named cultural group, a settlement at Castlepook or continuous occupation of Ireland. No securely associated stone-tool assemblage, hearth, dwelling floor, burial or repeated occupation surface of equivalent age has yet been recovered there. Moreover, the bone came from older cave investigations, where the original depositional context was incompletely recorded. Recent survey and excavation have sought surviving sediments, concealed entrances and material that can link the museum collections more securely to the cave's stratigraphy. Until such evidence is obtained, the femur is best treated as a significant possible trace of butchery, not as the foundation for a detailed story of "the first Irish".

No Politics, No Proven Trade

There is no evidence from Ireland around this notional date for political institutions, rulers, territories, diplomacy, organised warfare, farming villages, monuments, formal religion or writing. There is likewise no Irish evidence for trade networks at this time. If people visited during a climatic window, they would have been highly mobile hunter-gatherers, probably moving through a wider north-west European world in which animal resources, hides, stone and social connections mattered. That is a comparison with better documented Upper Palaeolithic Europe, however, not an established description of an Irish community.

The practical challenges would have been acute. Food availability changed seasonally; large mammals were valuable but dangerous and unpredictable; shelter, fire, clothing and knowledge of local routes would have mattered greatly. These are reasonable inferences from cold-climate hunter-gatherer lifeways elsewhere, rather than facts recovered directly from Derryvree or Castlepook. Ireland supplies no evidence for the language, beliefs, kinship systems, artistic traditions or learning of any visitors who may have arrived in this period.

An Archive of Change

The defining development around 31,051 BCE was not a recorded battle, migration or royal succession, but environmental instability. At Derryvree, ice had retreated or failed to cover a locality long enough for wetland life to leave a delicate archive; later ice returned and sealed it. At Castlepook, cave

fauna preserves evidence of a cold-adapted animal world and a tantalising possible sign of human carcass processing. Together they show an Ireland of shifting ecological opportunities rather than settled historical continuity.

This deep-time Ireland should therefore be understood through calibrated ranges, stratigraphy and fossil assemblages. The evidence securely supports cold, open freshwater habitats in Fermanagh and a diverse Pleistocene fauna in north Cork. It permits, but does not settle, the possibility of human activity. It does not permit an invented event for a numbered year. The surviving record is sparse, local and often difficult to date, but it is enough to reveal a landscape where ice, water, tundra plants and roaming animals repeatedly remade the prospects for life.

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31050 BCE

Fermanagh's Silt Window^[51]



The label 31,050 BCE is a useful modern filing point, not a date that anyone living in Ireland could have recorded or recognised. In the radiocarbon convention of “before present”, where present is AD 1950, it lies roughly 33,000 years ago. At this depth in time, neither archaeology nor earth science can identify a particular season, journey, hunt or political act in a calendar year. The responsible setting is a broad phase of the Late Pleistocene, within Marine Isotope Stage 3, when climate and ice margins altered sharply over millennia and sometimes more quickly. Ireland’s evidence for this period comes chiefly from sediments, fossil plants, insects and animal bones, rather than from settlements or written-like cultural traces.

A Date Within a Long Range

The most illuminating Irish record lies at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and exposed freshwater silts and fine sands sandwiched between two thick layers of till: unsorted sediment deposited by glacier ice. This sequence is important because it demonstrates an order of events. Ice had first occupied the locality; later, conditions allowed a body of freshwater and wet ground to form and gather organic sediment; a renewed glacial advance subsequently covered and sealed that deposit.

Organic material from the Derryvree freshwater series produced a conventional radiocarbon age of about 30,500 years BP, with a substantial uncertainty of roughly a millennium. Calibrated estimates place the deposit broadly within the later part of MIS 3, approximately 37,000–32,000 calibrated years BP, though calibration at such great antiquity necessarily carries wide ranges. Thus 31,050 BCE falls

plausibly within the broad age-span represented by the deposit, but cannot be attached to a particular layer, plant, animal or moment in its formation. Derryvree is a local environmental archive, not an annual chronicle and not proof that all parts of Ireland experienced identical conditions at the same time.

This caution matters because older labels such as “interstadial” can suggest a simple warm interval between glaciations. The Derryvree flora instead points to cold, open, periglacial conditions. The crucial fact is not that Fermanagh resembled a mild modern landscape, but that the site was at least temporarily free of overriding ice and supported freshwater habitats amid a severe climate. Ireland at this point was approaching the build-up to the Last Glacial Maximum, when ice later expanded across much or all of the island. The exact configuration and extent of ice at 31,050 BCE remain subjects of reconstruction rather than certainty.

Wet Ground in a Treeless Land

The Derryvree deposits preserve a striking glimpse of vegetation. Pollen and plant macrofossils indicate an open tundra or muskeg landscape, with mosses, sedges, grasses and herb-rich ground rather than closed woodland. Finds include plants associated with cold, wet places, among them bogbean, while mountain-avens, dwarf willow and arctic-alpine taxa are part of the wider picture reconstructed from the assemblage. A few tree pollen grains cannot be treated as evidence of local forest: pollen can travel far, and the broader fossil record points decisively to sparse, treeless cover.

Such a landscape should not be imagined as featureless white wilderness. Seasonal thaw could create pools, saturated sedge beds, shallow streams and mossy margins. Frost action disturbed exposed soil; low-growing vegetation occupied better-drained patches; and water collected in depressions. These habitats could be biologically productive during the brief growing season even while winters were long and severe. The freshwater silts themselves demonstrate standing or slowly moving water, and the plants show that cold did not mean lifelessness.

The climate was nevertheless unstable. Ice-sheet reconstructions for the British–Irish region show that the period from about 31,000 years ago onwards involved major advance, reorganisation and eventual retreat of ice. Conditions in Ireland were shaped by the interaction of North Atlantic climate, expanding glaciers, changing sea levels and local topography. The later ice sheet eroded or buried much of the older landscape. That destructive history helps explain why Ireland has so few surviving archaeological sites of this age: absence of evidence for people is not automatically evidence that no one ever entered the island, but it prevents firm claims of settlement.

Animals at the Atlantic Edge

Caves in north Cork, especially Castlepook Cave near Doneraile, supply a different class of evidence. Their Pleistocene faunas include remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, arctic fox, hares, lemmings and spotted hyena. Taken carefully, these finds show that cold-adapted and open-country animals reached Ireland during parts of the Late Pleistocene. They support an image of changing steppe-tundra and tundra environments capable of sustaining grazers, browsers, scavengers and predators.

They do not, however, provide a census of animals living across the entire island in 31,050 BCE. Cave assemblages may accumulate through carnivore activity, natural death, water movement and excavation history. Some specimens were recovered long ago, before modern recording standards, and several Irish cave dates have been re-examined as radiocarbon pretreatment has improved. At Castlepook,

revised dating has shown that some older measurements were substantially too young. The reliable lesson is broad but valuable: southern Ireland was repeatedly accessible to Ice Age mammals, and its environments changed enough over time to admit very different faunal communities.

Animal movement also implies changing geographical connections. During glacial periods, sea level was far lower than today, reducing the width and depth of the Irish Sea basin and altering coasts, river systems and possible routes through Britain. Yet lowered seas did not necessarily create a simple, dry land bridge at every moment. Glaciers, marine channels, lakes, unstable ground and distance all mattered. Ireland was not an isolated modern island in its physical geography, but neither can a continuous easy crossing be assumed.

The Human Question

The most provocative object associated with this era is a reindeer femur from Castlepook Cave, publicly reported as about 33,000 years old and bearing a deep mark interpreted as having been made by a stone tool during butchery. If that interpretation is confirmed through full contextual, microscopic and dating study, it would indicate a human encounter with a reindeer in Ireland broadly around the time represented by this article. It would not demonstrate a village, a permanent population, a named people or continuous occupation.

The distinction is essential. A radiocarbon result dates the death of the animal, not automatically the making of every mark on its bone. Whether a groove was made by a tool, a carnivore, trampling, excavation damage or another process is a separate taphonomic judgement. Nor has a securely associated stone-tool assemblage, hearth, dwelling, burial or repeated occupation surface of this age been established in Ireland. The later, firmly published evidence for Palaeolithic human activity is a butchered brown-bear bone from Alice and Gwendoline Cave in County Clare, dated to about 12,800–12,600 calibrated years BP—more than twenty millennia after the period considered here.

It follows that political affairs, diplomacy, named communities, language, religion and formal institutions are beyond recovery for Ireland in 31,050 BCE. There is no evidence for territories, chiefs, warfare, ritual monuments, exchange networks or artistic traditions on the island at this date. To supply them would be invention. Even if small groups occasionally crossed into Ireland, as the Castlepook bone may suggest, the surviving record cannot establish their numbers, ancestry, speech, beliefs or duration of stay.

Livelihood Without a Settlement Record

There is similarly no demonstrated Irish household economy to describe. No crops, domestic animals, pottery, houses, mines or managed fields belonged to this world. Any people who briefly travelled through such terrain would have relied on mobile hunting and gathering, fire, clothing, shelter and social knowledge comparable in broad principle to Upper Palaeolithic adaptations elsewhere in north-west Europe. But that is an inference from neighbouring regions, not a direct observation of life in Ireland. The Irish evidence establishes the environmental possibilities for such activity far more securely than the activity itself.

Reindeer would have been an important potential resource: meat, fat, hide, sinew, bone and antler could each be useful to hunter-gatherers. Mammoth, giant deer and smaller animals likewise belonged to ecosystems with varied opportunities and dangers. Spotted hyenas and wolves remind us that people, if present, would not have moved through an empty hunting ground. Yet there is no basis for identifying a

kill site, sharing practices, seasonal camp or trade route in Ireland. “Economy” at this date is best understood as the ecological availability of wild resources, not as an evidenced Irish system of production or exchange.

What This Year Can Mean

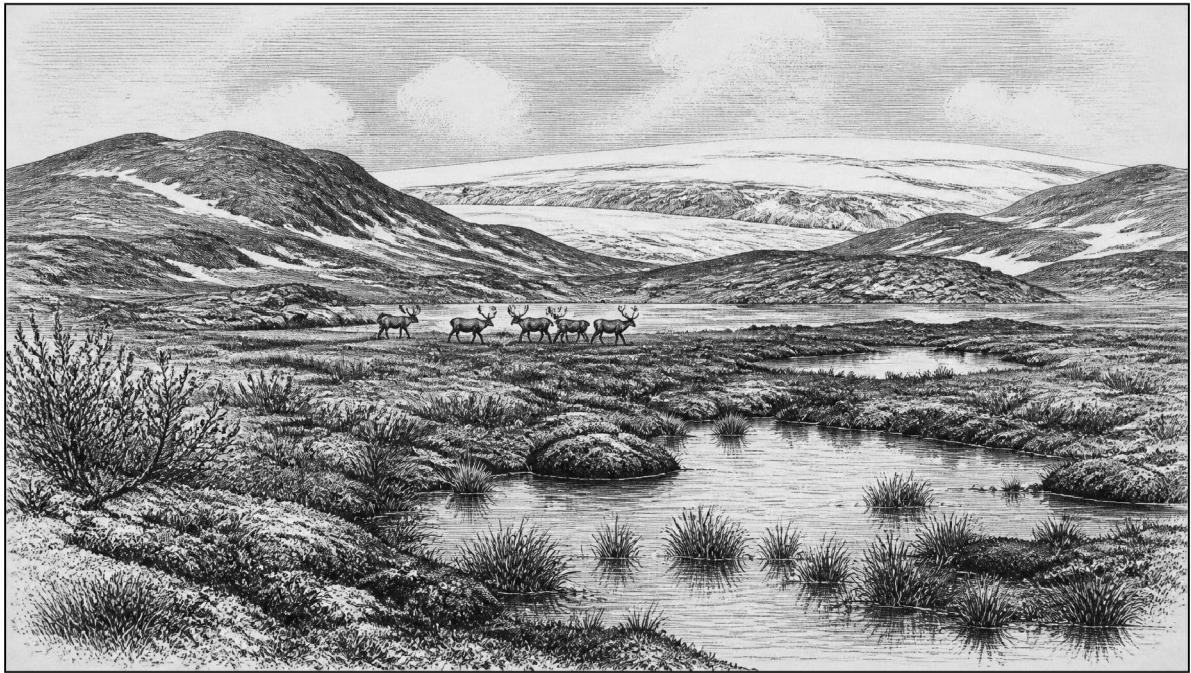
The principal historical development around 31,050 BCE was environmental, not political: Ireland was part of a northern Atlantic world in which cold, wetland habitats, mobile animal populations and growing ice sheets continually remade the conditions for life. Derryvree’s freshwater silt offers rare proof of a cold but habitable local landscape between glacial episodes. Castlepook’s cave fauna confirms that large mammals reached the island. The marked reindeer femur presents an intriguing but still limited possibility of human action.

That combination makes this a meaningful point in Irish deep history. It is not the beginning of an unbroken Irish population, nor an episode for which individuals or events can be named. Rather, it is a narrow window into the environmental stage on which later colonisation would eventually occur: a treeless, frost-affected Ireland, intermittently open to animal—and perhaps human—movement, soon to be transformed again by the advancing ice.

Chapter 052 of 100

31049 BCE

Castlepook's Reindeer Enquiry^[52]



Modern calendar precision cannot be applied responsibly to Ireland in 31,049 BCE. This numbered year is a modern backward count, equivalent to roughly 33,000 calendar years before AD 1950, the reference point conventionally used for “before present” (BP). No written record, dated settlement floor, individual grave or annually layered Irish archive can identify an occurrence in that particular year. The appropriate subject is therefore a broad archaeological and environmental horizon: the later part of Marine Isotope Stage 3, before the Last Glacial Maximum, when climates and ice margins were changing rapidly.

The evidence is substantial enough to illuminate parts of Ireland, but too uneven to furnish a conventional national history. It comes principally from buried freshwater deposits at Derryvree near Maguiresbridge in County Fermanagh; cave fauna at Castlepook, or Mammoth Cave, near Doneraile in County Cork; other southern cave finds; glacial sediments; and reconstructions of the growing British–Irish Ice Sheet. Together they show an island of regional contrasts: cold wetlands and open ground, animals capable of reaching Ireland from the wider north-west European landmass, and ice beginning to transform the prospects for both wildlife and any human visitors.

A Date Inside a Range

The closest especially informative Fermanagh sequence was exposed in roadworks at Derryvree in 1969. Fine freshwater sands, silts and organic material lay between two thick tills: unsorted debris deposited directly by glacier ice. The stratigraphy is decisive in its broad outline. An earlier glacier had covered the locality; then ice withdrew or ceased to occupy it long enough for freshwater sediment, plants and insects to accumulate; afterwards a later ice advance buried the deposit beneath another till. It is an archive of environmental change rather than an event in a historical year.

Organic material from the Derryvree sequence produced a radiocarbon result of $30,500 \pm$ about 1,100 radiocarbon years BP. Radiocarbon years are not calendar years: calibration is required because atmospheric carbon-14 has varied through time. The uncertainty of the original determination and the shape of the calibration curve mean that it corresponds to a broad multi-millennial interval, conventionally discussed as late MIS 3 and roughly the mid-30,000s to low-30,000s calibrated BP. Thus 31,049 BCE lies near the chronological horizon illuminated by Derryvree, but cannot be assigned to a particular layer, season or generation there.

Derryvree's Cold Wetland

Derryvree provides the strongest direct picture of an Irish habitat near this point in deep time. Pollen, plant macrofossils, mosses and insect remains point to a cold, open, treeless landscape with wet ground and freshwater pools. Sedges, mosses, dwarf willow, mountain avens, Arctic clubmoss and bogbean are among the plants identified or inferred from the assemblage. Bogbean is particularly revealing: it indicates shallow freshwater or marshy margins, not a featureless frozen desert. The insects likewise suggest a mossy, organic-rich wetland, often described as muskeg, with open water among vegetation.

This should not be mistaken for a gentle modern fen. The original investigators inferred harsh winters and cool summers. The landscape around the pool probably combined waterlogged hollows with exposed, sparsely vegetated ground susceptible to frost, wind and seasonal change. The surviving record is local: it cannot prove that every Irish valley or upland had the same plants, nor that the weather on the date in question resembled an average reconstructed from the deposit. Its importance is to disprove a simpler picture in which all Ireland was continuously and uniformly entombed beneath ice throughout the late Ice Age.

There was no farming, forestry, managed pasture or built settlement visible in this evidence. Nothing at Derryvree indicates fields, domestic animals, houses, food stores, boats, paths or a humanly altered woodland. The economy evident there was ecological rather than social: freshwater plants fixed energy, insects fed on plant material and detritus, and wetland communities occupied a landscape subject to the advance and retreat of ice. Such processes made resources patchy and seasonal even before considering the severe regional climate.

Mammoth Cave and the Animal World

At Castlepook Cave in north County Cork, excavations between 1904 and 1908 recovered a remarkable Ice-Age fauna. The National Museum of Ireland's collections include a spotted-hyaena skull from the cave, while research on the assemblage has identified mammals including reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, hare and lemmings. Some of those animals belong broadly to the late Pleistocene landscape relevant to this article's date. Their presence establishes that Ireland was repeatedly reachable by terrestrial mammals during portions of the last cold stage and that suitable habitats existed at least intermittently.

Yet Castlepook must be read with care. Early excavations did not meet modern standards of recording, deposits were disturbed, and water movement within the cave appears to have re-sorted bones. The collection is not one perfectly sealed herd or one moment of deposition. Direct radiocarbon dating has shown that the cave fauna accumulated across a long span, while recent redating has moved some

specimens substantially earlier than older measurements suggested. The evidence therefore supports a changing succession of animal communities, not a claim that every listed species stood together outside the cave in 31,049 BCE.

Even so, the assemblage evokes a formidable food web. Reindeer and perhaps giant deer would have grazed open terrain; mammoths required extensive forage; wolves and hyaenas were predators and scavengers; bears may have used caves as dens. Hyaena remains have special force because they are rare in Ireland and because the cave itself could have functioned as a refuge or trap within a broken limestone landscape. This was neither a mythical “Irish elk” paradise nor a scene confined to one species. It was an unstable northern frontier in which animals expanded, disappeared locally and returned as climate, vegetation, sea level and ice conditions altered routes into Ireland.

An Island Becoming Harder to Reach

At around 33,000 calibrated BP, lowered global sea level had altered the geography around Ireland, although coastlines and land connections cannot be reconstructed with absolute certainty at annual resolution. Ireland’s relationship with Britain and continental Europe was shaped not simply by an exposed “land bridge”, but by ice cover, relative sea level, isostatic depression, coastal plains, channels, rivers and proglacial waters. The faunal record demonstrates that crossings occurred at some stages; it does not establish an easy, permanent route or a single corridor used by all species.

More immediately, the ice sheet was growing. The latest BRITICE-CHRONO synthesis begins its reconstruction at 31,000 BP because evidence before then is scarce and uncertain. Its model depicts ice accumulation centres in Northern Ireland, central Scotland and Shetland, while stressing the limited direct constraints on the detailed extent of Northern Irish ice at that moment. Other work records substantial Irish ice-sheet loading on the western coast between about 40,000 and 19,000 calibrated BP, and a major fluctuation of the western ice margin at around 28,000 calibrated BP. These results caution against treating the island as either entirely ice-free or entirely glaciated in 31,049 BCE.

The trend nevertheless mattered. Over the following millennia, the British–Irish Ice Sheet expanded dramatically. At its maximum, broadly c. 27,000–23,000 calibrated BP, it covered Ireland and extended across the continental shelf. Glaciers scoured and buried older surfaces, helping explain why the evidence for this earlier world is so fragmentary. Derryvree survived precisely because its wetland sediments were sealed between tills; caves such as Castlepook protected some bones, while simultaneously mixing and complicating them.

The Human Question

Ireland’s possible human presence is the most important archaeological uncertainty attached to this horizon. A reindeer femur from Castlepook has been reported as carrying a deep linear mark interpreted as fresh-bone cutting or chopping by a stone tool. Associated dating has made the claim broadly relevant to about 33,000 years ago. If both the age and anthropogenic interpretation withstand continuing scrutiny, it would indicate that people visited Ireland in the Upper Palaeolithic far earlier than the long-accepted record of post-glacial settlement.

That possibility must not be inflated into a settled society. The 2022 reinvestigation of Castlepook found no cultural artefacts, and the cave’s older deposits remain difficult to reconstruct. There is no securely dated dwelling, hearth, stone-tool assemblage, burial, artwork or repeated occupation surface from Ireland that can be assigned to 31,049 BCE. One modified bone, however significant, cannot reveal

the number of people involved, their language, ancestry, route, season of travel or length of stay. It could represent a brief visit by highly mobile hunters, but even that is an interpretation rather than a demonstrated fact.

Accordingly, political affairs, diplomacy and warfare cannot be described for Ireland at this date. There are no named communities, territories, leaders, alliances or conflicts in the evidence. Nor is there support for claims about religion, ritual, formal learning, trade partnerships or artistic traditions on the island. Upper Palaeolithic people elsewhere in Europe certainly possessed complex social and cultural lives, but it would be unsound to transfer those particulars automatically to Ireland without an Irish archaeological context.

What Can Be Said Responsibly

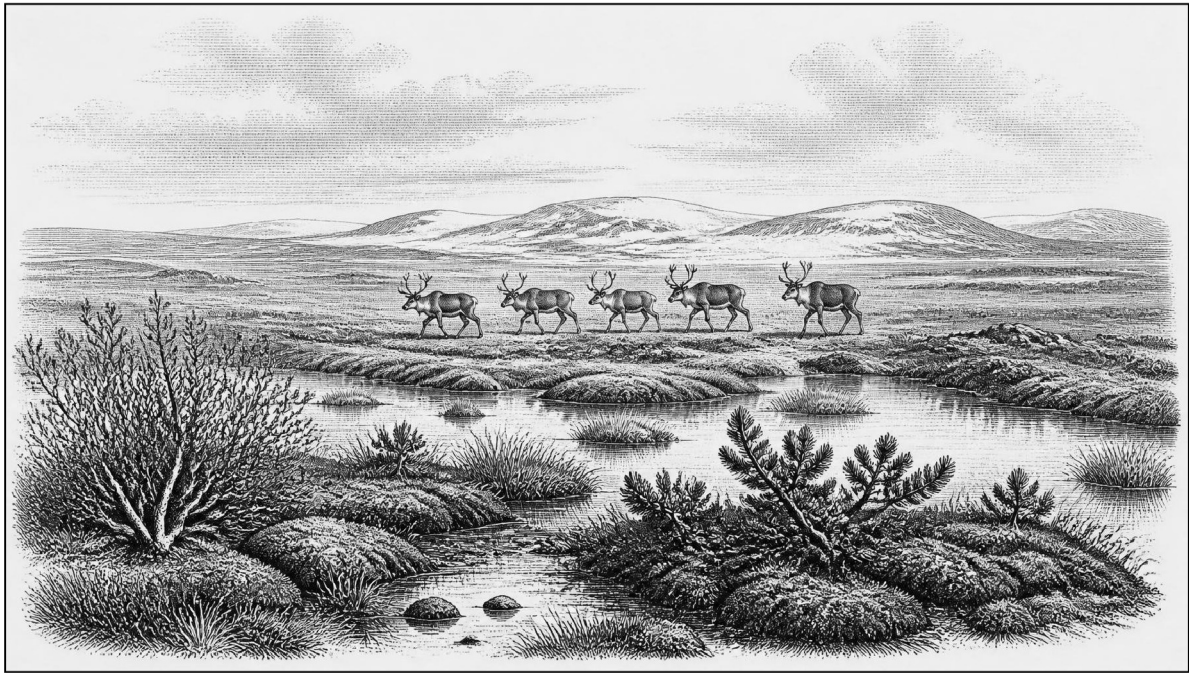
For 31,049 BCE, Ireland's history is best understood as a landscape on the threshold of profound glaciation. In Fermanagh, a freshwater wetland sustained cold-adapted plants and invertebrates between episodes of ice cover. In Cork and other southern caves, animal bones preserve evidence of a wider late-Pleistocene fauna whose members reached the island at different times and whose remains require careful redating and contextual study. Across the region, changing ice, coastlines and vegetation constrained movement and survival.

There is no annual chronicle here, but neither is there silence. The mud beneath a Fermanagh drumlin, the bones in a Cork cave and the landforms of the continental shelf record a real Irish past: environmentally varied, climatically severe and archaeologically incomplete. Their restraint is part of their value. They allow us to recognise a prehistory older than settlement, kingship or written memory, while marking clearly the boundary between what the evidence establishes and what imagination must leave unknown.

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31048 BCE

Derryvree's Moss Ledger^[53]



31,048 BCE is a modern calendar label, not a date at which Ireland can be observed year by year. No written record, settlement sequence or radiocarbon measurement can identify events in a single year so far back. In archaeological terms, this notional point falls around 33,000 calibrated years before AD 1950, during the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable phase of the last Ice Age. The responsible account of Ireland at this depth of time is therefore not a chronicle of rulers or battles, but a reconstruction built from sediments, fossil plants, animal remains, cave deposits and the later marks left by ice.

A Date Within a Range

The most useful Irish evidence close to this horizon comes from Derryvree near Maguiresbridge, County Fermanagh. There, excavators found a moss-rich organic freshwater deposit between two layers of glacial till. Its order is crucial: ice had covered the locality; water and vegetation then accumulated while the site was free of overriding ice; later glacial activity buried and preserved the deposit. Organic material from the freshwater series produced a conventional radiocarbon age of about 30,500 years before present, with a large uncertainty. When calibrated, published discussion places the deposit broadly between about 36,900 and 31,700 calibrated years before present.

The date represented by 31,048 BCE lies within that wide calibrated range, but this does not mean that the deposit records that individual year. Radiocarbon results are probabilities, calibration curves alter the relationship between radiocarbon years and calendar years, and the sampled organic matter may itself have accumulated over time. Derryvree can responsibly illuminate a broad environmental interval around this date: it cannot supply an annual weather report, a named community or a dated occurrence.

Freshwater Between the Ice

Derryvree nevertheless provides unusually direct evidence for an ice-free local landscape in north-central Ireland during part of MIS 3. The sediment contained remains of mosses and plants associated with wet ground and shallow freshwater, including sedges, grasses, herbs, dwarf shrubs and aquatic species. This was not a later Irish bog in the familiar sense, nor a green pastoral countryside. The assemblage has been interpreted as a treeless, cold muskeg or tundra-wetland mosaic: saturated ground, pools and slow water, with low vegetation able to endure short growing seasons and severe winters.

That reconstruction is an interpretation, albeit one grounded in the fossil evidence. The direct evidence is more limited but powerful: organic mud, plant macrofossils, pollen and the stratigraphic relationship to tills. Together they demonstrate local freshwater conditions and vegetation during an interval when ice was absent from the Derryvree site. They do not prove that every part of Ireland had identical terrain or climate. The island's relief, exposure to Atlantic weather, proximity to ice and drainage would have created regional variation. Some places may have been bare, stony or seasonally snow-covered; others supported sheltered wetland vegetation.

A Cold World, Not a Single Freeze

MIS 3 was cold by modern standards, but it was not an unbroken advance towards maximum glaciation. Rapid climatic shifts affected the North Atlantic region. Irish cave records, especially the episodic formation of speleothems at Crag Cave in County Kerry, indicate that intervals mild enough for liquid water to circulate underground occurred during the last glacial period. Such evidence does not turn 31,048 BCE into a temperate episode, but it cautions against imagining Ireland as permanently sealed beneath a uniform ice sheet.

The great expansion of the last British-Irish Ice Sheet came later. Research on Ireland's southern coast, Atlantic shelf and Irish Sea shows major advances during the period conventionally termed the Last Glacial Maximum, principally after this broad horizon. Precisely when ice expanded differed by sector, and reconstructions continue to be refined. Around the date in question, Ireland was entering neither a settled landscape nor a simple prelude to later history, but a changing glacial world in which ice margins, sea level, plant cover and animal pathways could alter over comparatively short geological timescales.

Castlepook's Animal Record

In north County Cork, Castlepook Cave near Doneraile preserves another essential, though difficult, archive. Its old excavations yielded a striking late Pleistocene fauna: woolly mammoth, reindeer, giant deer, brown bear, spotted hyaena, wolf, fox, hare and lemmings are among the animals reported from the cave system and associated collections. Modern radiocarbon reassessment has shown that some earlier dates were too young, and has placed important elements of the Castlepook fauna firmly within MIS 3, before the Last Glacial Maximum.

These remains establish that a much richer large-mammal fauna reached Ireland during parts of the Late Pleistocene than existed in later historic times. Reindeer and mammoth point towards open, cold-country habitats; hyaena and wolf point to predators and scavengers within that food web. Yet a cave assemblage is not a census of one valley on one day. Carnivores may have dragged carcass parts

underground, water may have moved bones, and early excavators removed much material without the recording standards expected today. The evidence supports a connected, dynamic north-west European fauna, but it cannot demonstrate that all listed species were contemporaries at Castlepook in 31,048 BCE.

The Human Question

There is no securely excavated settlement, hearth, dwelling, burial, tool-making floor or enduring occupation surface in Ireland that can be assigned to this calendar label. A reindeer femur from Castlepook has been reported as bearing a probable sharp-force cut or chop mark, raising the important possibility of human handling of animal remains in Ireland roughly 33,000 radiocarbon years ago. If the interpretation is sustained, it would be evidence of a very early human presence. It would still not identify a resident population, let alone a village or a continuous occupation.

Caution is especially necessary because the bone derives from a cave collection with complex depositional and excavation histories. A mark on a bone is not equivalent to a sealed camp. Nor can evidence of animal movement be automatically converted into proof of a human route. Lower sea levels altered the surrounding shelf and may at times have eased connections with Britain and continental Europe, but the changing Irish Sea basin, ice masses and coastal geography make simple claims of a permanent land bridge misleading. The sound conclusion is modest: people may have entered or used parts of Ireland in the Late Pleistocene, but their numbers, duration of stay, routes and activities around this date remain unknown.

No Kingdoms, No Recorded Conflict

Political affairs, diplomacy and organised warfare cannot be recovered for Ireland at this time. There are no named peoples, territories, leaders, boundaries or monuments from which to infer them. Nor is there evidence for farming, herding, permanent houses, trade networks or ritual sites. It would be wrong to populate the landscape with invented hunter bands merely because comparable groups elsewhere in Ice Age Europe hunted large animals.

Should people have been present, their lives would have depended on intimate knowledge of seasonal terrain, weather, animal behaviour, fuel and shelter. That is a reasonable general inference from hunter-gatherer lifeways, not a demonstrated social portrait of Ireland in 31,048 BCE. Likewise, stone tools, hide-working, food sharing, storytelling and spiritual practice are all plausible elements of Palaeolithic human life in Europe, but none is directly evidenced in Ireland at this point. Ireland's cultural history here is defined as much by absence of evidence as by evidence itself.

What the Record Can Say

The strongest history of Ireland around 31,048 BCE is environmental. Derryvree records cold freshwater wetland and treeless vegetation between episodes of glaciation. Castlepook records a formidable and varied cold-stage fauna, while also demonstrating the difficulties of interpreting old cave collections. Crag Cave shows that the wider Irish climate responded sharply to shifts within the last glacial period. Together, these archives replace the false image of an empty, featureless frozen island with a more convincing one: a region of wetlands, open ground, caves, animals and unstable ice margins.

That landscape was not yet historical Ireland in the ordinary sense. It had no documented communities, political institutions or cultural traditions traceable to a particular year. But it was a real Irish past, preserved in mossy silt, fossil bone, cave calcite and glacial sediment. Its lesson is methodological as well as historical: the deeper the past, the more carefully a calendar date must yield to ranges, contexts and the distinction between what has been found and what can only be inferred.

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31047 BCE

Reindeer, Hyenas and Cave Mud^[54]



The label 31,047 BCE gives a useful position in a modern chronological sequence, but it cannot identify an event that happened in Ireland in one knowable year. There was no calendar, writing, named people or dated political history on the island. In archaeological terms, the label falls about 32,996 years before 1950, conventionally expressed as c. 33,000 calibrated years before present (cal BP), within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3). At such depth, radiocarbon dates must be calibrated and normally yield probability ranges rather than a single calendar year. The responsible subject is therefore a changing environmental and archaeological horizon, not an annual chronicle.

A Cold Island Before the Maximum

Ireland was in the last Ice Age, but this does not mean that the whole island was necessarily buried beneath an unchanging ice cap at this particular point. The fullest Last Glacial Maximum came later, broadly between c. 26,500 and 19,000 years ago globally; work on the British–Irish Ice Sheet shows that its advance, peak extent and retreat differed by region. Around c. 33,000 cal BP, climates and ice margins were unstable. Parts of the wider British–Irish system were growing, while other localities could retain ice-free ground, wetlands or periglacial terrain. Ireland’s Atlantic setting, varied relief and changing sea levels made conditions especially regional.

This was a landscape heading towards more severe glaciation, not a stable ‘frozen Ireland’. Later ice repeatedly eroded and rearranged older deposits, leaving a difficult record. That destruction matters historically: the scarcity of very early archaeological sites may indicate thin or intermittent human use, but it also reflects the poor survival of campsites, soils and coastlines through glaciation, erosion and later

sea-level change. Caves and sediments sealed beneath glacial deposits are consequently disproportionately important. They preserve fragments of a world that open-air archaeology has mostly lost.

Derryvree's Wetland Archive

The most informative environmental evidence near this broad horizon comes from Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed fine sands, silts and organic layers lying between two tills: unsorted sediment deposited by glaciers. The sequence establishes a straightforward fact. Ice affected the site; then freshwater deposits and organic material accumulated during an interval in which the locality was not overridden; later glacial action buried the record. It is a rare Irish archive of environmental change between episodes of glaciation.

Organic material from the Derryvree deposit returned a conventional radiocarbon age of 30,500 radiocarbon years BP, with a large reported uncertainty of +1,170 and –1,030 years. Radiocarbon years at this age are not calendar years. With modern calibration, the deposit is broadly placed in a range of roughly 36,900–31,700 cal BP, or about 34,950–29,750 BCE. Thus 31,047 BCE can be used as a point within the wide interval illuminated by Derryvree, but cannot be attached to a particular season, pool, plant or animal there.

Its pollen, plant macrofossils and mosses indicate open, treeless, cold-country vegetation rather than woodland. Sedges, mosses, dwarf shrubs and herbs were associated with shallow freshwater and wet ground; finds reported from the deposit include mountain avens, an Arctic-alpine plant, and bogbean, an aquatic or wetland species. Such evidence supports a patchwork of marshy hollows, shallow pools, exposed mineral ground and low vegetation. It does not justify painting every part of Ireland as identical tundra. The record is local, and conditions would have varied with altitude, drainage, proximity to ice and the changing North Atlantic climate.

Animals on an Open Range

Southern Ireland provides a complementary, though differently formed, archive. Castlepook Cave near Doneraile in north County Cork produced Ireland's most important known collection of last-cold-stage mammal remains. Excavated principally in the early twentieth century and now substantially held by the National Museum of Ireland, the assemblage includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, mountain hare, Arctic and Norwegian lemmings, and spotted hyaena. These finds demonstrate that Ireland was intermittently connected to continental north-west European animal populations during the Late Pleistocene.

They should not, however, be treated as a census from one moment. A cave can be a den, a refuge, a trap, a place into which water or scavengers move bone, and a repository built up over thousands of years. Revised radiocarbon work has shown that some older dates from Castlepook required reconsideration, while the fauna itself spans more than one climatic phase. Mammoth, reindeer and hyaena remains therefore establish that these species reached Ireland during parts of the pre-Last Glacial Maximum period; they do not prove that every species shared the same valley, season or food web in 31,047 BCE.

Nonetheless, the combined Fermanagh and Cork evidence supports a demanding open-country ecology. Reindeer could exploit sparse vegetation and move across broad ranges; mammoth implies access, at least episodically, to productive herb-rich ground; small mammals help confirm cold conditions.

Spotted hyaena is a useful corrective to romantic views of an empty wilderness. Large carnivores and scavengers competed for carcasses and could carry bones into caves. The cave bone record is as much a history of animal behaviour, death and scavenging as it is of species presence.

The Castlepook Reindeer Claim

The date is especially significant because a reindeer femur from Castlepook has been publicly reported as bearing a deep linear mark consistent with cutting or chopping by a stone implement while the bone was fresh. The femur has been described as dating to about 33,000 years ago. If the identification of the mark as human-made, and its association with the animal's death, are sustained by full specialist publication and further analysis, it would be evidence that people processed a reindeer in Ireland in this broad period. It would substantially pre-date the securely published terminal-Pleistocene evidence from Alice and Gwendoline Cave, County Clare, where a butchered brown-bear patella has calibrated dates around 12,800–12,600 cal BP.

The correct conclusion remains narrower than many popular accounts. One modified bone, from a cave collection with a complicated excavation and depositional history, cannot demonstrate a permanent settlement, a camp, a population descended from later Irish communities, or a named Upper Palaeolithic culture. No securely associated hearth, stone-tool assemblage, dwelling floor, burial or human remains has yet shown that a community lived at Castlepook around this time. Stone marks on bone are assessed through their morphology, placement and comparison with carnivore damage, trampling, abrasion and excavation effects; the claim merits careful scrutiny rather than automatic acceptance or rejection.

People Without a Recorded Society

If people did reach Ireland at this time, the evidence is compatible only with a brief visit by a very small, mobile hunting group, perhaps taking meat, marrow, hide, sinew or other useful material from a reindeer carcass. That is an interpretation, not an established fact. The island's lower sea levels altered coastlines and narrowed some sea crossings in the wider region, but neither a simple dry-land route nor a particular journey to Cork can be inferred from the bone. Hunters elsewhere in Upper Palaeolithic Europe possessed sophisticated stone technologies and rich social traditions; that wider context cannot be used to supply missing Irish evidence.

There is no basis for political history in the usual sense. No Irish evidence identifies rulers, chiefdoms, territories, alliances, diplomacy, warfare, law or ethnic names. Nor can trade be demonstrated: the Castlepook fauna show animal movement and possible human access, not exchange networks. There were no farms, crops or domestic livestock; Ireland's farming communities lay more than twenty-five millennia in the future. A possible carcass-processing episode is economy at its most immediate, not proof of markets or organised provisioning.

Culture Beyond Recovery

Religion, art, language and formal learning are equally beyond direct recovery for Ireland around this date. Cave art and carefully made objects elsewhere in Europe show that Ice-Age people could sustain powerful symbolic lives, but no Irish evidence of this age demonstrates an equivalent shrine, image, ritual

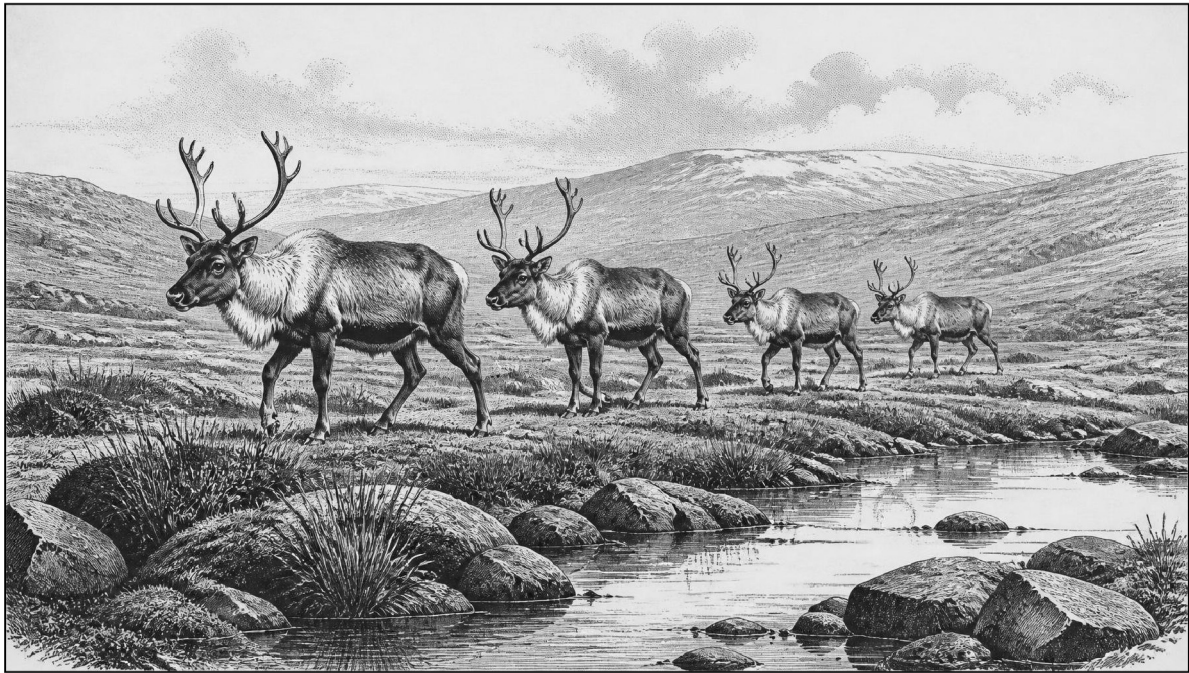
deposit or teaching tradition. It is reasonable to recognise that any visitors were fully social human beings with knowledge, relationships and cultural practices. It is not reasonable to assign them a language, beliefs or ritual system.

What survives instead is a disciplined outline: an island of changing ice margins, open and wet cold-country habitats, intermittent large mammals and predators, and perhaps a fleeting human encounter with a reindeer near Castlepook. Derryvree's plants and Castlepook's bones are not a narrative of a single year. Together, they make 31,047 BCE historically meaningful precisely because they reveal both the richness of deep Irish time and the limits of what the evidence can say.

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31046 BCE

Doneraile's Reindeer Evidence^[55]



“31,046 BCE” is a modern calendar label, not a date that people in Ireland could have recorded or that archaeology can resolve to a particular year. In the conventional archaeological timescale it falls roughly 33,000 calibrated years before present, where “present” means AD 1950. At such depth in time, even a well-measured radiocarbon determination commonly corresponds to a wide calendar range. The responsible subject, therefore, is not an event in one year but Ireland during a broad late-Pleistocene interval: the later part of Marine Isotope Stage 3, before the Last Glacial Maximum.

This was an unstable phase of the last Ice Age. Ireland was not the settled, wooded island familiar from later prehistory. Its climates, coasts, ice margins and animal communities changed over millennia and, at times, far more quickly. Much of the evidence has been erased by later glacial erosion. What survives is fragmentary: sediments trapped beneath ice-laid deposits, cave bone collections, pollen and plant remains, insects, landforms, and laboratory measurements. These sources can illuminate environments and animal movements. They cannot provide kings, borders, battles, languages or a dated political history.

A Date Within a Range

The most useful chronological distinction is between radiocarbon years and calibrated calendar years. A radiocarbon measurement records the remaining carbon-14 in once-living material; it does not directly return a calendar date. Atmospheric carbon-14 levels have varied, so results must be calibrated against internationally maintained curves. IntCal20 extends to 55,000 calibrated years before present, but uncertainty remains substantial at around 33,000 years ago. A named BCE year is consequently a useful filing point, not a known season, generation or episode.

Nor should the Last Glacial Maximum be projected backwards too simply. The global Last Glacial Maximum is usually placed at about 26,500–19,000 years ago, several millennia after this nominal year. Research on the British–Irish Ice Sheet shows that ice growth and decay varied sharply by region. Around 33,000 calibrated years ago, Ireland lay in an increasingly cold North Atlantic world, but the evidence does not warrant a map showing every part of the island either continuously ice-covered or uniformly ice-free. Local histories mattered.

Derryvree Between the Tills

One of Ireland's most important windows on this wider interval was exposed in 1969 at Derryvree townland near Maguiresbridge, County Fermanagh. Road works cut through a drumlin and revealed freshwater silts and fine sands, including organic material, held between two thick and distinct layers of till. Till is debris deposited directly by glacier ice. The sequence gives a secure relative order: an earlier phase of glaciation laid down the lower till; an interval without glacier cover at that spot permitted waterborne sediment and organic remains to accumulate; then a later ice advance overrode and sealed the deposit beneath upper till.

The organic series produced the conventional radiocarbon determination Birm-166, 30,500 radiocarbon years before present, with an uncertainty of more than a thousand years. Its calibrated placement spans a broad part of late Marine Isotope Stage 3, rather than a particular historical year. Yet its environmental meaning is unusually strong. The plant and insect evidence indicates open tundra vegetation and a periglacial regime: a cold landscape shaped by frost, with little or no woodland, wet ground and freshwater habitats. Mosses, sedges and other water- or marsh-associated plants demonstrate that this was not simply a featureless frozen plain.

Derryvree is important precisely because it limits speculation. It demonstrates that an ice-free freshwater locality existed in this part of Fermanagh during a cold interval between ice advances. It does not demonstrate that all Ireland was ice-free, nor that its wetland persisted unchanged across the whole calibrated range. The sediments record a local ecological opportunity, subsequently buried by ice, rather than an enduring landscape available to later communities.

Open Country and Animal Routes

Southern Irish caves provide a different kind of archive. Castlepook Cave, near Doneraile in north County Cork, was explored in the early twentieth century and produced a large, complicated collection of animal remains. Modern redating has shown why the cave matters: improved pretreatment methods pushed some of its faunal dates thousands of radiocarbon years older than earlier results had suggested. The cave is now recognised as one of the rare Irish repositories with evidence relevant to both pre- and post-Last Glacial Maximum faunas.

Its older assemblages include animals associated with cold, open environments and with large carnivores, notably reindeer, giant deer and spotted hyaena. Such bones are evidence that these species reached Ireland during parts of Marine Isotope Stage 3. They also show that Ireland was ecologically connected, at least intermittently, to the wider north-west European world. Lower sea levels altered the configuration of coasts and crossings, while animals could spread through changing landscapes. But cave finds do not show a continuous land bridge, a single migration route or a permanent local population for every species. Bones could arrive through natural death, carnivore activity, flooding and sediment movement; cave deposits are rarely simple living floors.

For an Irish landscape around this broad horizon, the secure picture is therefore one of cold, largely treeless country capable of supporting grazing animals, scavengers and predators. Reindeer imply available forage and seasonal mobility, while hyaena remains point to a food web more diverse and dangerous than any historic Irish fauna. The exact mix of habitats would have varied between limestone lowlands, uplands, river margins, sheltered basins and the edges of glaciers. No source permits a detailed reconstruction of the weather on a particular day in 31,046 BCE.

The Marked Reindeer Bone

A reindeer femur from Castlepook has made Doneraile especially significant in discussions of the earliest possible human activity in Ireland. The bone, held in the National Museum of Ireland's Natural History collections, has been reported to bear a deep linear mark interpreted as fresh-bone cutting or chopping by a sharp stone tool. County Cork's heritage publication has presented it as a Palaeolithic reindeer bone of about 31,000 BC. If the mark is anthropogenic and contemporary with the animal's death, it may indicate that a person processed part of a reindeer carcass in Ireland during this broad period.

That conditional wording is essential. The bone's date concerns the animal, not necessarily the moment at which a surface mark was made. Castlepook's collection also derives from a complex cave system excavated long ago, with material accumulated by several natural processes and without a modern, intact excavation context for this individual specimen. No securely associated hearth, stone-tool assemblage, dwelling surface, burial, repeatedly occupied camp or concentration of butchered carcasses has yet established a settled human presence in Ireland at this age.

The femur is thus neither proof of a Palaeolithic village nor a reason to dismiss the possibility of a brief visit. It is a serious but limited piece of evidence. The most cautious interpretation is that it raises the prospect of a small, mobile Upper Palaeolithic party entering an Irish landscape where reindeer and other large mammals were present. Whether such visitors arrived once, repeatedly or not at all cannot presently be decided from one modified bone. Future microscopic analysis, dating, recovery of securely stratified artefacts and renewed cave investigation could alter the balance of evidence.

Society Without a Chronicle

There is no basis for describing political institutions, warfare, diplomacy, named peoples or territorial control in Ireland at this time. If humans did reach the island, they left no securely dated evidence of houses, graves, art, ritual sites, food stores, boats or exchange goods. We cannot identify their language, beliefs, kinship system or cultural affiliation. Nor can evidence from better-known Upper Palaeolithic societies elsewhere in Europe be transferred wholesale across the sea to Ireland.

The same restraint applies to economy and trade. Reindeer hunting is a plausible interpretation only if the Castlepook mark proves to be human-made; it is not demonstrated as an established Irish subsistence system. There is no evidence for farming, herding, metalworking, pottery, long-distance trade networks or durable settlement. The most defensible account of everyday life concerns animals and environments: water gathered in Fermanagh wetlands, sparse vegetation grew during cold seasons, and grazing mammals moved through open habitats subject to abrupt climatic change.

What This Moment Means

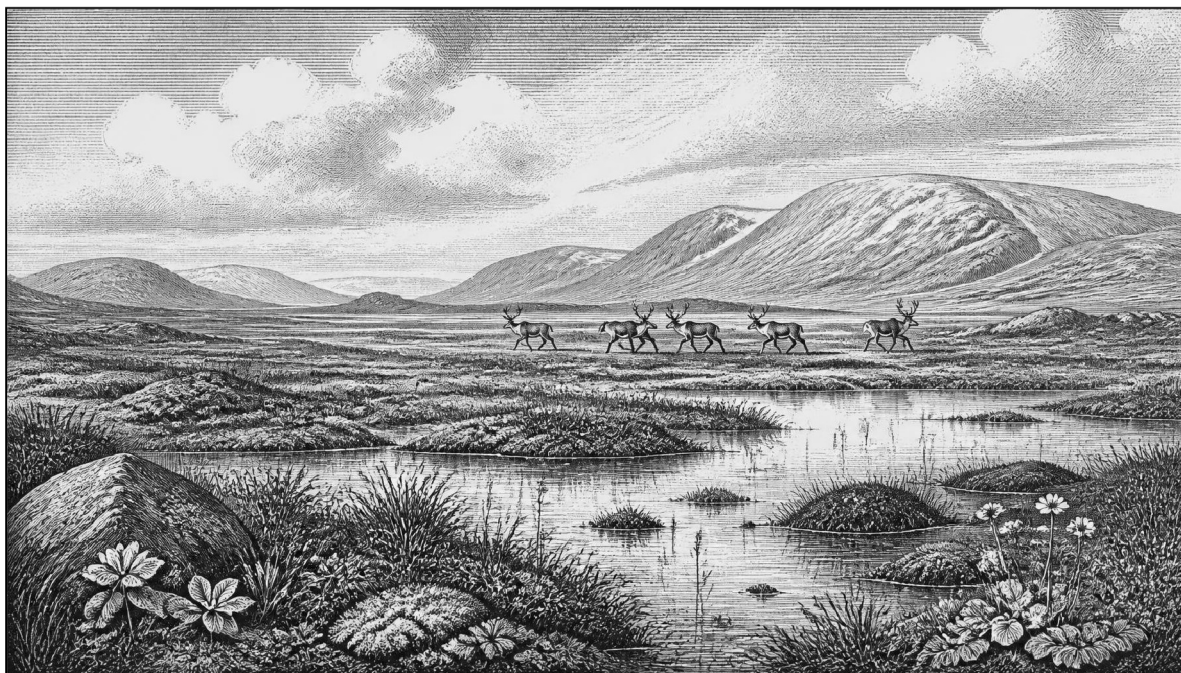
For Ireland, the importance of this nominal year lies in the tension between survival and loss. Derryvree preserves a wetland because later ice sealed it. Castlepook preserves bones because a cave protected them, although it also mixed and complicated their history. Elsewhere, the expanding and later retreating Irish Ice Sheet removed or buried much of the terrestrial record. The apparent silence of human archaeology may reflect genuine absence, brief and unsuccessful incursions, or the destructive power of ice and changing coasts. It cannot by itself settle the question.

Ireland around 31,046 BCE should therefore be understood as a changing Ice-Age landscape, not a year of recorded history. Its strongest evidence concerns cold freshwater habitats in Fermanagh and a southern cave fauna that includes reindeer and major carnivores. Its most tantalising human clue is the marked Castlepook femur. Together they reveal a place at Europe's north-western edge where life could enter during favourable intervals, while ice, climate and geography repeatedly narrowed the possibilities of lasting occupation.

Chapter 056 of 100

31045 BCE

Castlepook's Faunal Archive^[56]



31,045 BCE is not a date at which Ireland can be described through an annual chronicle. No contemporary writing, settlement sequence or securely dated human event permits that degree of precision. It is better understood as a modern calendar label falling within the Late Pleistocene, during Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. The relevant evidence comes in broad calibrated ranges, from buried sediments and animal bones rather than from named people or recorded actions. A responsible account must therefore distinguish what those remains demonstrate from what may be inferred from them.

A Date Within Deep Time

In arithmetic terms, 31,045 BCE lies nearly 33,000 years before the radiocarbon reference year of AD 1950. But archaeological chronology is not simple arithmetic. Radiocarbon laboratories report ages in radiocarbon years before present, not calendar years; changing atmospheric carbon levels mean that results need calibration against independently dated records. At this antiquity, a single measurement can calibrate across a substantial span. The internationally used IntCal20 curve extends to 55,000 calibrated years before present, but it does not transform a sparse Irish record into an annual timetable.

The closest major Irish environmental archive is Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed a remarkable sequence: freshwater silts and fine sands, with organic material, lay between two thick and distinct deposits of till. Till is debris deposited directly by glacier ice. The order is unambiguous: an earlier ice advance laid down the lower till; an interval without local glacier cover allowed water, sediment and vegetation to accumulate; a later advance sealed the deposit under fresh till.

Organic material from the Derryvree succession, laboratory determination BIRM-166, produced a conventional radiocarbon age of about 30,500 years BP, with a large error margin. Modern calibration and the original stratigraphy make it appropriate to place the deposit broadly within later MIS 3, rather than attach it to a particular year. A calibrated range often cited for this determination is approximately 36,900–31,700 cal BP, or roughly 34,950–29,750 BCE. Thus 31,045 BCE belongs within the broad time represented by the archive, but cannot be assigned to a particular pool, plant or season in it.

Water Between the Ice Sheets

Derryvree is important because it refutes a simple picture of an island continuously buried beneath ice. It does not show that all of Ireland was ice-free at once, nor that conditions were mild. It does show that, during part of the interval between glacial advances, the Fermanagh locality supported freshwater and wet-ground communities. Plant macrofossils, pollen, mosses and insect remains point to cold, open, largely treeless country: a periglacial mosaic of shallow water, sedge-rich or mossy margins, damp ground and exposed mineral soils.

Among the plants identified from the Derryvree material are species associated with cold or wet environments, including mountain avens, bogbean and aquatic or waterside vegetation. Their presence is evidence for a functioning local ecosystem, sustained at least seasonally by liquid water. It should not be romanticised into a sheltered lakeside landscape. The wider climate was severe, with short growing seasons, substantial frost action and little woodland. Sparse tree pollen in a deposit of this kind cannot safely be read as proof of nearby forest: pollen can travel far, and older grains can be redeposited.

The landscape was also inherently temporary. A freshwater basin existed because ice, melting water, drainage and sediment had created it; later ice overwhelmed and preserved its sediments. The drumlin visible today is consequently not merely a landform but part of the historical evidence. It embodies repeated transformations of the ground by ice flow, thaw, standing water and renewed glaciation. Ireland around this broad horizon was environmentally varied over time and regionally uneven, not a stable stage on which a settled society can be placed.

Castlepook and the Animal World

County Cork provides the other indispensable window. Castlepook Cave, near Doneraile and also known as Mammoth Cave, produced a large collection of Ice-Age bones during excavations directed by Richard J. Ussher and colleagues in the early twentieth century. Subsequent study, including the Irish Quaternary Fauna Project and later radiocarbon redating, has shown both the value and the difficulty of the collection. The cave preserves evidence of animals reaching Ireland before the Last Glacial Maximum, but many bones came from old excavations in complex cave sediments whose original associations were incompletely recorded.

The pre-Last Glacial Maximum fauna associated with Castlepook and comparable Irish evidence includes reindeer, woolly mammoth, giant deer, brown bear, wolf, foxes, mountain hare, lemmings and spotted hyaena. These species should not be imagined as one perfectly simultaneous herd or food chain. Direct dates and modern reanalysis show that cave assemblages accumulated over long periods; carnivores, water movement, natural deaths and human excavators could all mix material. Nevertheless, the fauna establishes that parts of Ireland offered routes, forage and shelter to cold-adapted mammals during portions of MIS 3.

Reindeer are particularly evocative, but they were not alone in defining this world. Lemmings signal cold, open habitats; mammoth and giant deer indicate the potential for large herbivores; hyaena and wolves reveal predation and scavenging. A cave may have served as a den, trap, refuge or place where bones were brought in, rather than as a straightforward record of animals living immediately outside its entrance. The cautious interpretation is a mobile Ice-Age fauna moving through an intermittently habitable western peninsula, not a fixed local menagerie.

This was before the fullest expansion of the last British–Irish Ice Sheet. The global Last Glacial Maximum is generally defined as about 26,500–19,000 years ago, while evidence indicates that the British–Irish Ice Sheet reached maximum local extent at roughly 27,000 years ago. At 31,045 BCE, that major advance still lay ahead, though ice masses and changing sea levels already shaped the region. Sea level was lower than today, and Ireland’s physical relationship with Britain and the continental shelf differed greatly from the modern island setting. Exact routes across the wider landscape remain uncertain, and no simple, continuously dry ‘land bridge’ should be assumed for every phase.

The Human Question

Castlepook is also central to the unresolved question of whether people reached Ireland at this early date. A reindeer femur from the cave has been reported as bearing a deep linear mark interpreted as a fresh-bone cut or chopping trace made by a sharp stone tool. The bone has been publicised as about 33,000 years old. If microscopic and taphonomic study ultimately confirms that the mark was made by a person at the time of the animal’s death, it would be exceptionally early evidence for human handling of a carcass in Ireland.

That conclusion remains conditional. A radiocarbon determination dates the death of the animal, not automatically the act that marked the bone. Nor can one modified specimen from an early excavated, mixed cave collection establish a camp, a resident population, a journey, hunting strategy or language. No securely associated stone-tool assemblage, hearth, dwelling floor, burial or repeated food-processing area has yet demonstrated a human community in Ireland at this horizon. The National Museum of Ireland accordingly continues to state that clear evidence of Palaeolithic human presence has not emerged.

The distinction matters especially for society and everyday life. There is no evidence from 31,045 BCE for Irish political institutions, leaders, territories, warfare, diplomacy, religious observance, trade systems, farming, permanent settlements or artistic traditions. It would be misleading to supply them by analogy with better-known Upper Palaeolithic communities in Britain or continental Europe. Should the Castlepook modification prove anthropogenic, the most that can presently be said is that one or very few highly mobile people may have visited or used the island’s cold-country resources. It would not demonstrate colonisation.

What Can Be Said

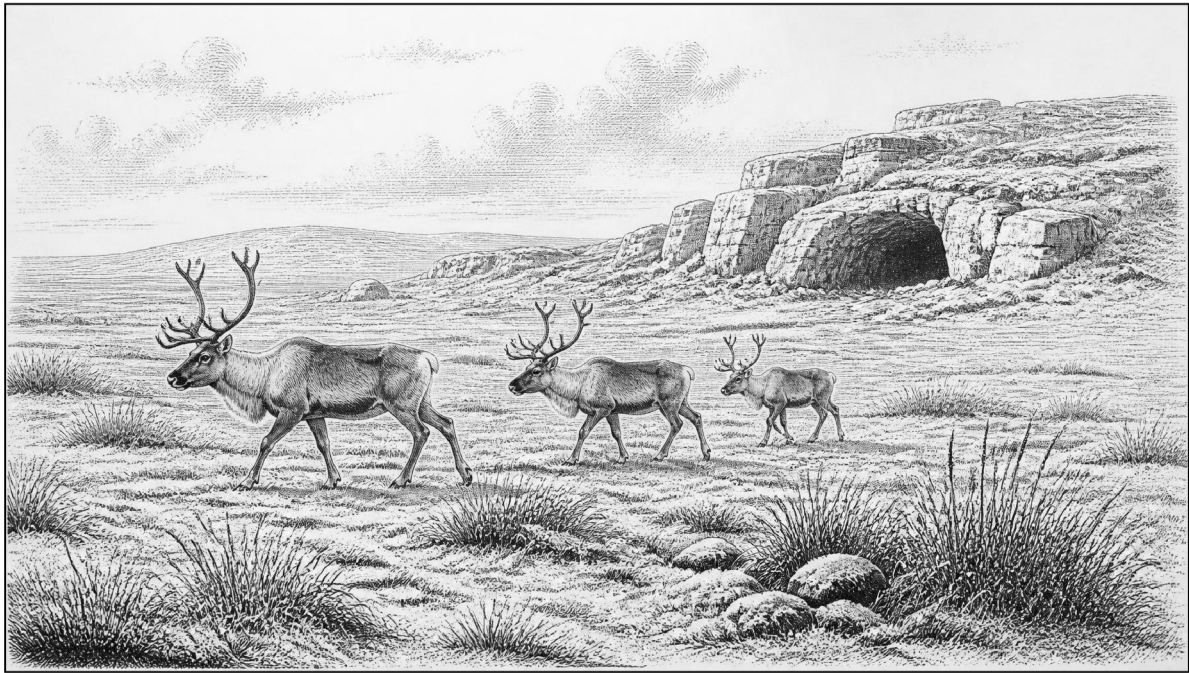
The most substantial history of Ireland at this point is environmental and zoological. Freshwater sediment at Derrynree records an ice-free interval in Fermanagh; Castlepook’s bones record a varied cold-stage fauna in Cork; later glacial deposits show that these habitable patches were vulnerable to transformation or destruction by returning ice. Museum collections, field records, improved bone pretreatment, radiocarbon calibration, palaeobotany and renewed cave excavation continue to refine that picture.

For this reason, 31,045 BCE should be treated neither as a blank nor as the beginning of a conventional national story. It illuminates an Ireland without demonstrable states or communities, but not without history: a shifting land of tundra-like wetlands, cave-dwelling carnivores, grazing herbivores and advancing ice. The most important lesson is methodological. Deep prehistory is not made more meaningful by forcing it into precise calendar events. Its achievement lies in recovering, carefully and provisionally, the changing conditions that eventually made later human settlement possible.

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31044 BCE

Elephant Hall's Bone Mosaic ^[57]



“31,044 BCE” is a modern filing date, not a year that can be recovered from Irish prehistory. No calendar, written record or archaeological sequence can distinguish one season, let alone one day, at this depth of time. It corresponds only approximately to 33,000 calendar years before present, where “present” in radiocarbon practice is AD 1950. Evidence from this era is dated in ranges, often first in radiocarbon years and then calibrated against records of changing atmospheric carbon. Those ranges can be wide; individual finds may also be older or younger than one another by millennia. The responsible subject, therefore, is Ireland during the broad climatic interval around 33,000 years ago, rather than an event alleged to have happened in a single year.

A Mid-Glacial Ireland

This was the Late Pleistocene, within Marine Isotope Stage 3, before the coldest and most extensive phase of the last glaciation. Ireland was not yet the familiar island of later prehistory, with settled coasts, forests and a distinctive human archaeology. It was part of a changing north-west European world shaped by severe cold, unstable ice margins, lower sea levels and migrations of animals across landscapes repeatedly altered by frost, water and ice.

Even the ice cover requires caution. The BRITICE-CHRONO reconstruction begins at 31,000 years ago because earlier constraints are sparse. Its preferred model depicts centres of ice accumulation in Northern Ireland, central Scotland and Shetland, but this is a large-scale reconstruction with margins of error, not a map of a precisely dated Irish ice front. Other research argues that the British–Irish Ice Sheet may have had a longer and more dynamic pre-Last Glacial Maximum history, with advances and retreats during Marine Isotope Stage 3. The shared conclusion is important: around this date, Ireland’s climate and geography were in transition towards a far harsher glacial world.

There was no Irish state, tribe, kingdom, diplomacy or frontier that archaeology can identify. Nor is there evidence for a settlement network, farming, craft production, trade or religious practice. Such absences are not gaps to be imaginatively filled. They are central historical facts. If people did enter Ireland during this period, their presence was fleeting enough, or their traces fragile enough, that no securely stratified camp, hearth, stone-tool assemblage or burial has yet demonstrated a resident population.

Castlepook's Uneven Archive

The chief Irish evidence for this remote interval comes from Castlepook Cave, near Doneraile in north County Cork. Its limestone passages include chambers named Elephant Hall and Hyaena Hall by early investigators. Excavations between 1904 and 1918 recovered a remarkable quantity of fossil bone, and the cave remains Ireland's richest known archive of vertebrate life before the Last Glacial Maximum. More than 2,000 bones have been recovered; determinations on individual specimens span a long stretch of the Ice Age rather than a single occupation or one neatly bounded deposit.

That last qualification matters. A cave bone collection is not automatically a snapshot of the landscape outside. Bones may have been brought in by predators, dragged by scavengers, washed or reworked by water, moved by collapse, disturbed by animals, or displaced during historic excavation. Castlepook contains deposits affected by water, and its early excavations removed much of the material before modern standards of stratigraphic recording and sampling were available. The cave is invaluable precisely because its evidence is rich, but it is difficult precisely because its history is composite.

Radiocarbon results underline the problem and the opportunity. An early measurement on a woolly mammoth femur from disturbed Castlepook sediment gave $33,500 \pm 1,200$ radiocarbon years BP. Later accelerator dating and improved pretreatment of bone collagen showed that several older Irish cave dates had underestimated the true antiquity of the animals concerned. A 2020 reassessment found that new Castlepook dates could be roughly 5,000 to 12,000 radiocarbon years older than earlier results, placing important parts of the fauna firmly in Marine Isotope Stage 3. These are dates for animal remains, however, not a calendar for cave activity and certainly not proof that every bone entered the cave together.

Animals of an Open Country

The faunal list associated with Castlepook is striking: woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with wolf, Arctic fox and lemmings represented in later cold-stage deposits. The overall assemblage shows that Ireland could support a varied Ice Age mammal community at different points before and during the last glacial maximum. It also shows that the island's fauna was not simply a miniature copy of Britain's. Some animals familiar from British late-Pleistocene sites, including woolly rhinoceros and steppe bison, are absent from the Castlepook record.

For a date around 33,000 calendar years ago, mammoth, reindeer, giant deer and spotted hyaena are especially relevant because dated or re-dated Castlepook material places their wider community in the middle part of the last glacial cycle. The safest reconstruction is not a crowded tableau in which every recorded species stands together at a Cork cave mouth. Rather, it is an intermittently occupied open landscape capable, over time, of supporting large grazers and browsers, formidable predators and cold-adapted small mammals. Reindeer and lemmings point towards cold, exposed conditions; mammoth and giant deer indicate substantial grazing resources; hyaenas testify to carnivores able to exploit carcasses and, at times, use caves as dens or repositories.

Vegetation must be reconstructed more cautiously still. No pollen diagram from Castlepook can provide a season-by-season picture of north Cork in 31,044 BCE. Yet the fauna, together with comparable north-west European evidence, is consistent with largely treeless grassland, herb-rich steppe or tundra-like mosaics, broken by wet ground, stream corridors and sheltered patches. Such country could look productive during a short growing season, while remaining punishingly cold, windy and unstable for much of the year. The familiar Irish patchwork of enclosed fields, hedgerows and wooded pasture lay far in the future.

Hyaenas, Carcasses and Ecological Risk

Spotted hyaena deserves emphasis because Castlepook is exceptional in Ireland for this animal. Its presence changes how the cave's bones are read. Hyaenas are powerful bone-crushers and carcass collectors; gnawing, breakage and transport can resemble some humanly generated damage at first glance. A cache of bones may record hunting and scavenging on the landscape, but it also records the selective habits of a carnivore. Elephant Hall and Hyaena Hall therefore preserve evidence of an ecosystem and of cave use, not a straightforward record of human meals or domestic life.

This was a landscape of risk and opportunity for any visiting humans. Mammoth, reindeer and deer offered meat, hide, marrow, antler and bone, but obtaining or processing a carcass could bring people into competition with wolves and hyaenas. That observation is an ecological inference, not proof of a hunt at Castlepook. No weapons, hearths, dwellings or structured working areas of this date have been found in Ireland. The scale of the island's surviving record does not permit claims about population, language, kinship, leadership, conflict or seasonal routes.

The Human Question

A reindeer femur from the Castlepook collection has been publicised as carrying a mark consistent with cutting or butchery by a stone tool, and as dating to roughly 33,000 years ago. If that interpretation is sustained by detailed taphonomic study and securely connected to the date of the bone, it would be of enormous importance: it could push evidence for human handling of animals in Ireland far back into the Upper Palaeolithic.

For now, it should be described as a significant but unconfirmed claim, not as the foundation for a story of settled Palaeolithic Ireland. A radiocarbon measurement dates the death of the reindeer, not automatically the making of a surface mark or the identity of its maker. Furthermore, Castlepook's complicated depositional history and the capacity of carnivore damage, sediment abrasion and old excavation practices to obscure context set a high evidential threshold. A 2022 excavation located surviving sediments and recovered animal remains, but found no cultural artefacts; the site had previously been treated in the national record as lacking evidence for human occupation.

The contrast with County Clare is useful. At Alice and Gwendoline Cave, a brown-bear kneecap bearing cut marks has been independently radiocarbon dated to calibrated ranges around 12,810–12,590 and 12,810–12,685 years BP. That terminal-Pleistocene find is widely presented as Ireland's first direct evidence of human presence, though debate continues over what a single modified bone can tell us about duration and scale of occupation. It is many thousands of years later than the Cork proposal. It should not be used to fill Castlepook's silence.

Regional Change Without a Chronicle

Ireland's position in the wider region was nevertheless crucial. Lower global sea levels altered coastlines and narrowed some sea passages, while ice, rivers, sea channels and changing land surfaces shaped possible movements between Ireland, Britain and continental Europe. Faunal arrivals demonstrate that connections existed at particular times, but they do not by themselves reveal a single route or prove an open land bridge at this exact date. Nor can the evidence establish trade or diplomacy: animal dispersal is not human exchange.

What can be said is that Ireland was part of a north-west European environmental zone undergoing profound regional change. The advancing and retreating ice system would eventually erode, bury or remove many open-air deposits. That helps explain why caves are so prominent in the evidence and why the archaeological record is so uneven. Castlepook survives as a deep archive of animal lives, carnivore behaviour, water movement and changing climates. It does not yield an Irish society in the conventional historical sense.

What This Date Can Mean

For Ireland around 31,044 BCE, the most important development is environmental rather than political: a cold-stage landscape was supporting a changing community of large mammals and predators while the British–Irish Ice Sheet was building towards its later maximum. Castlepook provides unusually strong evidence for that ecological world, but its mixed cave deposits demand restraint. The responsible historical picture is of open, cold country; mammoth, reindeer, giant deer and hyaena among its inhabitants; and a tantalising, unresolved possibility that people may have encountered or butchered a reindeer there. Beyond that lies possibility, not demonstrated history.

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31043 BCE

Derryvree Pools and Castlepook Reindeer^[58]



31,043 BCE is a modern calendar label imposed on a time for which Ireland has no annual chronicle. It cannot responsibly be tied to a named ruler, community, battle, migration, ceremony or even a particular season. In radiocarbon terms, the label falls roughly 32,990 years before AD 1950, but the evidence available for Ireland comes in broad calibrated ranges, not year-by-year dates. The most useful comparison is the freshwater sequence at Derryvree, near Maguiresbridge in County Fermanagh, whose organic deposits are generally placed within a wide interval of about 36,900–31,700 calibrated years before present. Thus this numbered year lies within the broader horizon potentially represented by the deposit, not at a securely identifiable point inside it.

A Cold Interval, Not a Calendar Year

This was the later part of the Late Pleistocene, within Marine Isotope Stage 3: a climatically unstable period before the fullest development of the Last Glacial Maximum. Ireland was not a uniform icebound land at every moment, nor was it a country of forests and settled valleys. Ice expanded and contracted regionally over long periods; exposed ground, periglacial terrain, wetlands and local glaciers formed a changing mosaic. Modern reconstructions of the British–Irish Ice Sheet suggest that, around 31,000 years before present, substantial ice caps and mountain glaciers existed in parts of Ireland, especially in northern and upland districts, while the exact limits and timing of ice advance remain uncertain in many regions.

The year therefore belongs to a phase of approaching glacial severity rather than to the Last Glacial Maximum itself, which came later. This distinction matters. A map showing an ice sheet at its greatest extent cannot simply be projected backwards onto 31,043 BCE. Conversely, the survival of a wetland deposit at one site cannot demonstrate that all Ireland was ice-free or habitable. The island's Pleistocene

history has been repeatedly disturbed by ice, erosion and changing sea levels. Many former soils, campsites and shorelines will have been removed, buried or drowned. What remains is exceptionally valuable, but fragmentary.

Fresh Water Beneath a Drumlin

Derryvree is the clearest environmental archive close to this date. Roadworks in 1969 cut through a drumlin and exposed fine sands, silts and organic deposits lying between two substantial tills: unsorted sediments left by glacier ice. The sequence records an earlier glacial episode, followed by an interval in which freshwater sediment accumulated, then a later return of ice. That order of deposits is direct evidence that the precise locality was not continuously glacier-covered. It does not show how extensive the ice-free area was, how long it lasted in human generations, or what occurred in any single year.

The plants and small organisms preserved in the Derryvree sediments give the landscape its most intelligible character. Pollen, seeds, mosses and insect remains indicate open, treeless vegetation rather than woodland. Grasses, sedges, herbs and juniper formed part of the vegetation, while aquatic and wetland plants, including bogbean, point to pools, slow water and waterlogged ground. Mosses and insect evidence have been interpreted as a cold muskeg or tundra-wetland environment: a patchwork of saturated ground, plant-rich shallows and open water, subject to long hard winters and short productive summers.

This was not an empty white wilderness. In a severe climate, sheltered wet ground could still sustain plants, insects and the food chains dependent on them. Yet it was a low-productivity world, exposed to frost, wind and abrupt climatic change. There is no evidence of fields, livestock, crops, built houses or managed woodland. The material at Derryvree represents natural environmental processes, not a settled cultural landscape. Its importance lies precisely in preserving a living community of plants and invertebrates from a period for which such Irish evidence is rare.

Castlepook's Animal World

At the opposite end of the island, Castlepook Cave near Doneraile in north County Cork offers a different kind of archive. Also known as Mammoth Cave, it yielded one of Ireland's richest collections of Pleistocene vertebrate remains during excavations in the early twentieth century. The assemblage includes animals now absent from Ireland, among them woolly mammoth, reindeer, giant deer, spotted hyena, Arctic fox and lemmings. Some re-dating has shown that parts of the faunal record belong to Marine Isotope Stage 3, before the Last Glacial Maximum.

These animals should not be imagined as a single herd photographed at one instant. Cave collections accumulated over long periods, and old excavations often removed bones with far less stratigraphic control than modern archaeology requires. Individual dates can differ considerably, and some deposits or collections contain material from more than one phase of the Pleistocene. Castlepook nevertheless demonstrates that cold-adapted mammals reached Ireland during episodes when conditions and routes of access allowed them to do so. Spotted hyenas, in particular, indicate not merely grazing country but a functioning predator-and-scavenger ecology.

The cave itself was probably more important as a carnivore den and bone trap than as a human home. Hyenas can transport carcass parts into caves, gnaw bones and scatter material through repeated occupation. That makes the assemblage invaluable for reconstructing fauna but difficult to turn into a

simple scene of hunting. Mammoth bones establish that these great animals occurred in the wider Irish region during the period represented by the cave fauna; they do not prove that people hunted them, watched them, or encountered them in this particular year.

The Reindeer Femur and the Human Question

A reindeer femur from Castlepook has transformed discussion of Ireland's earliest possible human presence. It has been radiocarbon dated to around 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as a modification made on fresh bone by a sharp stone tool. If that interpretation is confirmed, it would indicate that people processed a reindeer carcass in Ireland or handled the limb before it entered the cave system. It would push evidence for human activity on the island far earlier than the previously secure terminal-Pleistocene traces.

Its significance needs careful limits. The dated bone is not a stone-tool assemblage, hearth, dwelling floor, burial, structured deposit or repeatedly occupied camp. No associated spear point, butcher's knife, charcoal-rich fire-place or concentration of food waste has been published from a secure Castlepook context for this horizon. Nor does the date of an animal's death automatically establish the exact timing of a surface mark. The femur can support a serious hypothesis of human carcass processing; it cannot yet furnish a full narrative of permanent settlement.

Accordingly, society and everyday life remain mostly unknown. If people were present, the cautious inference is of a small, highly mobile Upper Palaeolithic group able to use a sharp stone edge and exploit large game. They may have removed meat, hide, sinew or marrow from a carcass, whether hunted or scavenged. Such behaviour is well known elsewhere in Upper Palaeolithic Europe, but applying it to Ireland is interpretation rather than direct observation. There is no basis for identifying a language, ethnic identity, household structure, social hierarchy or population size.

No Politics, No Trade Network

Political affairs, diplomacy and organised warfare leave no identifiable evidence for Ireland at this depth of time. No chiefdoms, territories, alliances, forts or formal boundaries can be reconstructed. Equally, no trade network is known. A human crossing to Ireland, if the Castlepook evidence reflects one, would imply knowledge of movement across a changing seaway or coastal landscape, but it does not prove regular maritime exchange. Lower global sea levels altered the configuration of coasts, yet Ireland was not simply an extension of continental Europe on a secure land bridge. The character and difficulty of any crossings varied with local ice, sea level and route.

There is also no direct evidence for religion, art, burial practice, formal learning or ritual at 31,043 BCE. It would be wrong to fill that silence with later Irish myths or with images borrowed uncritically from famous French cave art. Palaeolithic people elsewhere possessed rich cultural traditions, but Ireland's evidence does not currently reveal whether comparable practices occurred here. The appropriate historical emphasis is not on imagined beliefs but on the material conditions that made survival, animal movement and perhaps brief human visits possible.

An Island in Ecological Transition

The decisive development around this date was environmental instability. Derryvree records a cold wetland existing between glacial advances; Castlepook preserves evidence of a northern animal community capable of occupying the island during favourable windows. Together they contradict any simple picture of a permanently sealed landscape, while also warning against the opposite fantasy of a continuously populated Ice Age Ireland. Conditions were variable, regional and liable to change on timescales far longer than a calendar year.

For 31,043 BCE, then, Ireland's story is one of pools beneath later ice, open tundra vegetation, roaming cold-climate mammals and a disputed but consequential sign of human action on a reindeer bone. The evidence is enough to show that Ireland participated in the wider ecological world of north-western Europe during Marine Isotope Stage 3. It is not enough to name its inhabitants, narrate an event, or claim an enduring society. The most responsible account preserves both achievements: the extraordinary depth of the record and the boundaries of what it can say.

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31042 BCE

Crag Cave's Broken Stalagmites^[59]



Modern calendar-year precision is not available for Ireland around 31,042 BCE. No contemporary people counted years, and the evidence does not identify an event that happened in that numbered year. The date is best treated as a point within a broad late Ice Age horizon, roughly 33,000 years before the present, during Marine Isotope Stage 3. Radiocarbon measurements and other scientific dates must be calibrated, and their uncertainties are substantial at this depth of time. The closest important Irish environmental range comes from Derryvree, near Maguiresbridge in County Fermanagh: organic sediments there have been calibrated to approximately 36,900–31,700 years before AD 1950. That range overlaps 31,042 BCE, but it does not turn the deposit into an annual chronicle.

A Cold, Changing Island

Ireland was in a severe glacial-age world, but it was not simply a single white expanse under permanent ice. The maximum development of the last British–Irish Ice Sheet lay in the future, broadly after about 27,000 years ago and especially around 25,000–23,000 years ago in many reconstructions. Around the date represented here, climate repeatedly shifted between colder and relatively milder episodes. The island's landscapes, coastlines and routes for animals changed accordingly. Sea level was far lower than today, exposing broad areas of the Irish Sea basin; yet this did not necessarily create a simple dry-land bridge from Ireland to Britain or continental Europe. Travel, whether by animals or people, depended on the changing arrangement of sea, ice, shore, river valleys and seasonal conditions.

The most revealing Irish evidence for this interval is environmental rather than archaeological. At Derryvree, roadworks cut through a drumlin and exposed fine sands and freshwater organic silts trapped between two layers of glacial till. The lower till records an earlier ice advance; the organic bed records a

later interval when open ground, freshwater and vegetation were present; the upper till shows that ice subsequently returned and overrode the landscape. The deposit is therefore a powerful warning against imagining either an unchanging tundra or an unbroken ice sheet.

Plant remains, pollen, mosses and insect evidence from Derryvree indicate a cold, treeless, waterlogged environment often described as muskeg or tundra wetland. Sedges, grasses, mosses and hardy arctic-alpine plants could grow around shallow pools and saturated ground. Sparse dry ground may have supported low herbs and dwarf shrubs, but there is no basis for picturing Irish woodland, cultivated fields or the later green pastoral landscape. Winters were harsh and seasons strongly marked. The sediments show an ecosystem capable of supporting life, yet vulnerable to renewed cold, snow accumulation and glacial expansion.

Caves and the Ice-Age Fauna

County Cork provides another important window. Castlepook Cave, near Doneraile in the Awbeg valley beneath the Ballyhoura Hills, has yielded Ireland's richest known assemblage of pre-Last Glacial Maximum animal remains. Its fossils include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena. Not every animal represented in the cave need have lived there at the same moment: bones accumulated over long periods, and a cave may serve as a carnivore den, shelter, trap, drainage route and sediment store. Nevertheless, the assemblage establishes that Ireland was repeatedly reached by a varied cold-stage fauna.

At about this broad period, open country was essential. Reindeer and lemmings are particularly suggestive of cold, largely treeless landscapes, while mammoth, giant deer, wolves and hyaenas indicate a wider north-west European ecological setting rather than an isolated biological backwater. Castlepook's spotted hyaena is especially remarkable, because the species is otherwise unknown from Ireland. Its presence also complicates the story told by bones: hyaenas could carry carcass parts into caves, gnaw them, scatter them and mix material of different ages. A mammoth bone or reindeer femur in a cave is not, by itself, proof that people hunted that animal or used the cave as a home.

Crag Cave in County Kerry adds a different kind of evidence. Broken and displaced stalagmites from the cave have been dated by uranium-thorium methods. Their episodic growth during the later part of Marine Isotope Stage 3 implies intervals when liquid water could percolate through the shallow cave system and average annual conditions were sufficiently mild for calcite to form. This does not mean warm weather by modern standards, nor does it describe the whole island. It does reinforce the wider conclusion from Derryvree: Ireland's Ice Age climate changed abruptly and repeatedly, with local habitats opening and closing across centuries or millennia.

The Castlepook Reindeer Question

The period has acquired special human importance because of one reindeer femur from Castlepook. Re-examined by zooarchaeologist Ruth Carden, the bone has been reported as carrying a deep mark interpreted as having been made by a sharp stone tool while the bone was fresh. A modern radiocarbon assessment has been publicly associated with an age of roughly 33,000 years, and County Cork heritage material gives the object an approximate date of c. 31,000 BC. If the surface modification is confirmed as anthropogenic and contemporary with the animal's death, it would be a potentially momentous trace of Upper Palaeolithic people handling a reindeer in Ireland.

That conclusion must remain carefully qualified. The bone derives from historic cave excavations, not from a modern, intact occupation floor. The radiocarbon result dates the animal bone, not necessarily the exact moment of marking, the place where the animal was killed or the duration of any human visit. Castlepook has not produced a securely associated hearth, stone-tool assemblage, dwelling, burial, food store or stratified campsite of this age. Carnivore activity and water movement further complicate the original context. The responsible description is therefore not that a permanent Irish population is known at 31,042 BCE, but that a single exceptionally significant specimen may record human butchery during this broader interval.

If people did process the reindeer, they were almost certainly mobile hunter-gatherers operating within a much larger north-west European world. Reindeer could offer meat, fat, hide, sinew and bone; a successful encounter might support a small travelling group, but the femur alone cannot reveal group size, language, ancestry, season, tool type, travel route or whether the animal had been hunted, scavenged or found dead. It is likewise impossible to infer a camp at Castlepook. The cave's animal-rich deposits make it valuable evidence for the landscape in which people might have moved, not a demonstrated Palaeolithic settlement.

No Politics, No Recorded Beliefs

Political affairs, diplomacy and warfare cannot responsibly be reconstructed for Ireland at this date. There were no states, kingships, tribes named in writing, borders or institutions known from the evidence. Nor is there Irish evidence for a shrine, burial rite, artwork, musical tradition, teaching system or ceremonial monument of this age. Wider Upper Palaeolithic Europe demonstrates that people elsewhere made sophisticated stone tools, ornaments, images and social networks, but those continental discoveries cannot be transferred automatically to Ireland. They provide context for possibility, not direct proof of Irish culture.

The same caution applies to economy and trade. There is no evidence for farming, livestock, pottery, metalworking, permanent villages or exchange systems in Ireland around this horizon. If people came, their economy would have depended on movement, local knowledge and the temporary use of wild resources in an unstable cold environment. Connections beyond the island are plausible because the fauna itself had reached Ireland, but no Irish artefact has yet demonstrated a specific route, trading relationship or cultural affiliation. "Ireland" is used here as a geographical term only; neither the modern island's political divisions nor later identities existed.

Evidence Buried by Ice

The scarcity of human evidence is itself historically important. Later ice advances eroded, transported and buried older deposits, while changing sea levels drowned former coastal landscapes. In caves, nineteenth- and early twentieth-century excavation often removed deposits before modern recording standards existed. Recent research at Castlepook and other caves, including new dating and carefully targeted excavation, shows why museum collections and apparently exhausted sites remain scientifically valuable. It also shows why old claims must be retested as laboratory methods improve.

For this point around 31,042 BCE, the clearest picture is therefore one of environmental possibility rather than a documented society: treeless wetland in Fermanagh, intermittently milder conditions recorded in a Kerry cave, and cold-adapted mammals moving through open terrain in Cork. The reindeer

femur from Castlepook may add a fleeting human action to that picture. It cannot yet supply a year-specific narrative, but it makes this deep interval one of the most consequential and actively investigated thresholds in Irish prehistory.

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31041 BCE

Derryvree's Intertill Freshwater Series^[60]



Modern calendar-year precision is not available for Ireland in 31,041 BCE. No one on the island recorded a year, a ruler, a battle or a seasonal occurrence; indeed, there is no securely identified settlement, hearth or tool assemblage that can be placed in this particular year. The date is a modern chronological label, roughly 33,000 years before the radiocarbon convention of AD 1950. It falls in the Late Pleistocene, during Marine Isotope Stage 3, a long and climatically unstable part of the last Ice Age. The responsible history of Ireland at this depth is therefore a reconstruction from ice-laid sediments, fossil plants, insects, animal bones and cave deposits, all dated in ranges rather than to an exact calendar year.

A Date Within a Long Range

The closest unusually informative Irish evidence comes from Derryvree townland, about two kilometres north-east of Maguiresbridge in County Fermanagh. Road excavations in 1969 cut through a drumlin and exposed freshwater silts and fine sands enclosed between two thick, distinct layers of till: unsorted debris left by glacier ice. The sequence establishes an important order of events. Ice had reached the locality and deposited the lower till; during a later ice-free interval at that spot, water and organic sediment accumulated; then renewed glacial activity covered the deposit with upper till. It is a record of environmental change, not a diary of a particular year.

Organic material from the freshwater series, sample BIRM-166, produced a conventional radiocarbon determination of 30,500 years BP, with a substantial uncertainty of $\pm 1,170$ – $1,030$ years. Modern calibration has been expressed as approximately 36,900–31,700 calendar years BP, or about 34,950–29,750 BCE. The date 31,041 BCE lies inside that broad interval, but this overlap must not be

exaggerated. It does not demonstrate that a particular pool, sedge bed or animal population existed in that numbered year. It means that Derryvree is the best local archive for the sort of cold, fluctuating landscape that may responsibly illuminate Ireland at this point.

Wet Ground Between Ice Advances

The Derryvree sediments contained plant and insect evidence interpreted as a full-glacial, open-tundra environment. Rather than woodland, the locality supported a wet, exposed mosaic of shallow pools, saturated ground, mosses and low vegetation. The insect assemblage has been read as evidence for a muskeg-like wetland: organic-rich water and peat-forming ground with open pools, fringed by mosses. Such a place was not lifeless. It offered microhabitats in which aquatic and wetland plants, invertebrates and cold-adapted vegetation could survive, even while the wider climate remained severe.

That conclusion is evidence-based, but it is also local. Derryvree cannot stand for every valley, coast or upland across Ireland. A freshwater basin in Fermanagh had its own drainage, shelter, altitude and relationship to nearby ice. Nor should the presence of organic sediment between tills be converted into a claim that all Ireland was ice-free. It shows that this part of northern Ireland experienced an interval without ice cover at the site itself, between separate episodes of glaciation. The upper till is equally important: conditions later changed enough for ice to return or expand over the wetland and bury its record.

Climate in Motion

At 31,041 BCE, Ireland was not yet at the Last Glacial Maximum, the later phase when the Irish sector of the British–Irish Ice Sheet became far more extensive. Yet it was already part of a high-latitude Atlantic world in which climate could shift markedly over millennia and sometimes much more abruptly. The Derryvree evidence belongs to this unstable setting. In south-west Ireland, uranium-thorium dates from broken and reworked speleothems in Crag Cave show episodic growth during MIS 3. Because cave calcite needs liquid water to percolate through soil and rock, these growth phases indicate intervals when mean annual conditions locally rose above freezing. They reinforce the picture not of unchanging cold, but of climatic oscillation.

These records do not yield a weather report for 31,041 BCE. They do, however, establish the scale of uncertainty that any historical reconstruction must respect. An apparent improvement in one cave record or one wetland sequence need not have produced the same conditions everywhere at the same moment. Ice-sheet margins were mobile, coastlines lay far beyond their modern positions because global sea level was lower, and landscapes could change as snowfields, permafrost, rivers and frozen ground responded to shifts in temperature and moisture. The familiar map of Ireland, with its modern shorelines, roads and fields, is of little help in visualising this world.

Animals on the Southern Landscape

Fermanagh supplies the clearest environmental sequence, but the principal evidence for large mammals comes from limestone caves in southern Ireland, especially Castlepook Cave near Doneraile in north Cork. Old excavations there recovered a remarkable but complicated assemblage, including mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyena.

Direct dates show that some of these animals occurred in Ireland before the Last Glacial Maximum. The cave is therefore powerful evidence that parts of Ireland could support, or at least be reached by, varied cold-stage mammals during the wider period.

It is not, however, a single intact animal community frozen in time. Castlepook was explored in the nineteenth and early twentieth centuries, before modern excavation standards. Its bones came from a cave system affected by carnivore activity, collapse, water movement and later disturbance. Radiocarbon dating has shown that the assemblage spans long stretches of time, and researchers warn against treating every species found there as contemporary. The animal list is best understood as a regional archive accumulated over millennia, not as a census of the landscape in 31,041 BCE.

Even with that reservation, the cave evidence suggests an open, cold landscape capable of sustaining grazing and browsing animals, their predators and scavengers. Reindeer and mammoth evoke broad feeding ranges; lemmings and Arctic fox point towards severe conditions; spotted hyena reveals a carnivore guild now unimaginable in Ireland. The presence of hyena remains at Castlepook is particularly significant because the cave is Ireland's foremost cold-stage mammal locality. Yet fossils tell us occurrence, not abundance. They cannot establish whether herds were numerous, seasonal visitors or sparse populations passing through a wider north-west European range.

The Human Question

There is no sound basis for describing a settled human society in Ireland in 31,041 BCE. No house, hearth, burial, settlement surface or securely associated stone-tool assemblage is known for this date. A reindeer bone from Castlepook has been presented as bearing a possible fresh-bone cut or chop mark and has attracted attention as a potential indication of human carcass processing around 33,000 years ago. If that interpretation is ultimately sustained, it would transform the chronology of human activity in Ireland. It would still indicate an encounter with an animal, perhaps by one person or a small mobile group, rather than a permanent population or a village.

For now, the evidential context demands restraint. The relevant specimen derives from an old cave collection rather than a modern, sealed excavation context. Natural damage, carnivore modification, breakage and post-depositional movement must always be excluded before a mark can be securely accepted as human work. Subsequent research at Irish caves has underlined how important direct dating, re-excavation and taphonomic study are in separating human action from the complex histories of cave deposits. The first firmly published evidence for Palaeolithic human presence currently rests much later, in the terminal Pleistocene record from Alice and Gwendoline Cave in County Clare.

No Politics, Trade or Ritual Record

Political affairs, diplomacy and organised warfare are beyond the reach of the evidence. There are no named peoples, territories, chiefs, alliances or institutions. Likewise, no Irish evidence from this point permits claims about language, religion, art, schooling, trade routes, social rank or family structure. It is tempting to import the better-known Upper Palaeolithic cultures of continental Europe into Ireland, but that would confuse analogy with proof. People elsewhere in Europe made sophisticated stone technologies, ornaments and cave art; none of this demonstrates their presence in Ireland at 31,041 BCE.

The economy that can be observed is ecological rather than human. Wetland plants photosynthesised, insects occupied narrow habitats, herbivores fed across open country and carnivores exploited animal carcasses. If people did reach Ireland during this broad period, hunting and scavenging large game would

be plausible activities by comparison with contemporaneous hunter-gatherers elsewhere. But plausibility is not evidence. The Irish record does not reveal the mode, frequency or season of any visits, still less a network of exchange.

What This Year Can Mean

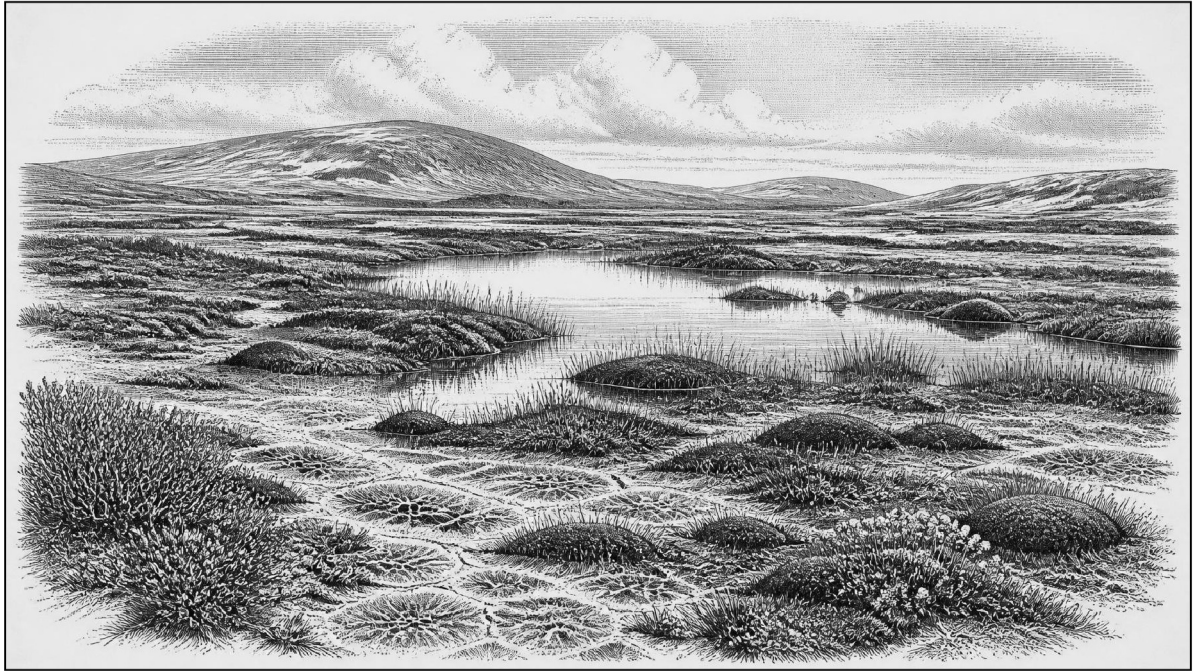
The most important development represented by 31,041 BCE is not a human event but a precarious environmental interval. At Derryvree, freshwater and organic sediments accumulated after an earlier glacial episode and before later ice covered the site. Across the island, the surviving record is patchy because subsequent glaciers eroded, mixed and buried older deposits. In Cork, caves protected fragments of a vanished mammal world, although their chronology and formation histories remain difficult to disentangle. In Kerry, cave mineral deposits preserve evidence that milder episodes punctuated the wider cold stage.

Ireland at this date was consequently neither a blank white void nor a familiar inhabited island in waiting. It was a changing Late Pleistocene landscape, locally capable of wetland life and visited or occupied by varied cold-adapted animals, while ice conditions altered across the region. The Derryvree freshwater series is its clearest witness: a small, buried archive which shows why the past must be described in calibrated ranges, cautious inferences and environmental processes rather than invented annual events.

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31040 BCE

Derryvree's Mosses and Midges ^[61]



“31,040 BCE” is a useful modern label, not a date at which an Irish event can be placed with calendar-year accuracy. No written record, settlement sequence or annually resolved environmental archive exists for Ireland at this depth of time. The responsible frame is the later part of the Pleistocene, within Marine Isotope Stage 3, during the Midlandian cold stage. The most informative Irish evidence is a buried freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its radiocarbon determination, 30,500 +1,170/-1,030 radiocarbon years BP (BIRM-166), calibrates broadly to about 36,900–31,700 years before AD 1950. In approximate BCE terms, that is c. 34,950–29,750 BCE. The nominal year 31,040 BCE falls within that wide range, but cannot be tied to a particular season, generation or layer of mud.

A Wetland Between Ice Advances

Derryvree was exposed in 1969 when roadworks cut through a drumlin, revealing organic silts and fine sands sealed between two distinct tills. Till is unsorted debris laid down by glacier ice; the sequence therefore has a powerful basic message. An earlier advance had deposited the lower till. During a later interval, freshwater accumulated and plants, insects and other small organisms left traces in the sediment. A subsequent ice advance overran and buried the wetland beneath the upper till. The deposit is not an ancient village, but it is a rare surviving document of a landscape that later glaciation mostly erased.

The fossils point to an open tundra or muskeg environment in south Fermanagh. Herb pollen, plant macrofossils, mosses and invertebrate remains indicate cold, treeless ground with wet hollows and pools rather than continuous woodland. Sedges and mossy vegetation could exploit saturated ground; hardy herbs and low shrubs occupied more exposed surfaces. The evidence supports a patchwork of shallow

water, marsh, damp mineral soil and sparse dry ground. It does not justify a detailed painted panorama of every plant or a claim that the whole island looked identical. Fossil pollen can travel, preservation is uneven, and one enclosed basin records its own locality most clearly.

Nevertheless, Derryvree decisively complicates the old picture of a uniformly ice-covered Ireland throughout the latter Ice Age. At some point during its dated interval, this part of north-central Ireland was ice-free long enough for freshwater sediment and a cold-climate biological community to develop. That conclusion is local, not national. Elsewhere, uplands may have supported glaciers or persistent snowfields, and the surviving evidence for earlier ice advances is difficult to disentangle from the effects of later ones. Ireland was a changing, regionally varied northern landscape, not a fixed frozen island.

Before the Greatest Expansion

This date also preceded the fullest known development of the last British-Irish Ice Sheet. Research on the surrounding continental shelf and on Irish landforms places the major maximum considerably later, broadly around 27,000–23,000 calibrated years BP in many Irish reconstructions, with regional advances and retreat histories differing around the coast. Thus the wetland at Derryvree belongs to a phase of climatic severity and instability before the later ice sheet achieved its greatest extent. It must not be imagined as a gentle interval: periglacial conditions involved repeated freezing and thawing, seasonally frozen ground, strong winds, short growing seasons and a landscape in which water and ice constantly rearranged sediment.

The geography was also unlike that of the present. Global sea level was lower than today because enormous volumes of water were held in ice sheets, enlarging coastal plains and altering the shape of the surrounding seas. Yet neither Derryvree nor the cave finds of southern Ireland provide a secure map of routes across those landscapes. It is unsafe to state that people or particular animals walked to Ireland across a known land bridge at this exact time. The appropriate conclusion is narrower: the island's coasts, sea crossings and ecological connections were different, while their precise configuration and accessibility changed through time.

Animals and the Castlepook Question

County Cork supplies a second, very different kind of evidence. Castlepook Cave, near Doneraile, has yielded remains of cold-stage animals including reindeer, mammoth and spotted hyaena. Modern redating has shown that several older cave chronologies required revision, an important warning against treating antiquarian collections as simple time capsules. Cave deposits may mix bones accumulated over long periods; carnivores can drag carcasses underground; water, excavation and later disturbance can move material. Animal remains from a cave can demonstrate that a species occurred in the wider region, but not necessarily that all species lived together, or that the cave was a human campsite.

One Castlepook reindeer femur has attracted particular attention because it was directly dated to roughly 33,000 years ago and bears a deep mark interpreted by zooarchaeologist Ruth Carden as damage from a sharp stone implement during carcass processing. If that interpretation is sustained, it would be exceptionally early evidence of human activity in Ireland. It would indicate at least one episode in which people handled a reindeer carcass, not a settled population, a named group or a permanent colony. There are no securely associated hearths, dwelling floors, stone-tool assemblage, burials, ornaments, art or

human remains from Ireland at this date. The National Museum of Ireland's long-standing caution that clear Palaeolithic human evidence is lacking captures why the claim requires continued testing through stratified excavation, taphonomic analysis and further dating.

The marked bone should therefore be neither dismissed nor enlarged into a story it cannot bear. It makes a human visit plausible; it does not tell us whether the animal was hunted, scavenged, butchered elsewhere and carried to the cave, or encountered by a group travelling through. It offers no direct evidence for language, kinship, leadership or belief. The most defensible human history for this date is a question under investigation, not a recovered biography.

Society Without Institutions

For that reason, political affairs, diplomacy and organised conflict cannot responsibly be described for Ireland in 31,040 BCE. There is no evidence for polities, territories, chiefs, treaties, fortifications or warfare. Nor can religion be reconstructed from the Derryvree wetland or a marked bone. The absence of proof does not mean that any visitors lacked social relationships or ideas; all human communities have social lives. It means that Irish evidence has not preserved traces sufficient to identify their institutions, rituals or cultural identities.

What can be said about possible everyday practice is similarly modest. In the wider European Upper Palaeolithic, mobile hunter-gatherers possessed sophisticated knowledge of animals, stone, clothing, fuel and seasonal terrain. That broad comparison can suggest what a short visit to cold-stage Ireland might have required: warm garments, portable equipment, careful food planning and close attention to weather and game. It cannot establish that any particular technology was used at Castlepook, because no securely contemporaneous toolkit has been recovered there. The reindeer femur, if humanly modified, implies practical carcass processing; it does not document a local economic system.

No Trade, No Settlement Record

There is likewise no evidence for trade in the usual historical sense: no imported objects, exchange network, boats, market place or specialised production can be assigned to Ireland around this date. The economy visible at Derryvree is ecological rather than human: plants converting a brief growing season into biomass; insects and grazing animals using the available habitats; water collecting and draining across frost-affected ground. If people were present, animals such as reindeer would have represented valuable food, hide, sinew, bone and perhaps seasonal knowledge. But this remains an inference from hunter-gatherer lifeways elsewhere, not a demonstrated Irish practice.

Settlement evidence is absent. Derryvree was a wetland, not a house site, and Castlepook's old faunal collection lacks the stratigraphic certainty needed to identify a habitation surface of this age. The best historical image is consequently one of intermittent possibility. Ice-free patches supported cold-adapted vegetation and animals; changing ice and climate could close those landscapes again; any human presence may have been brief, mobile and archaeologically fragile. Later glaciation would have scoured, buried or redeposited much of what once existed.

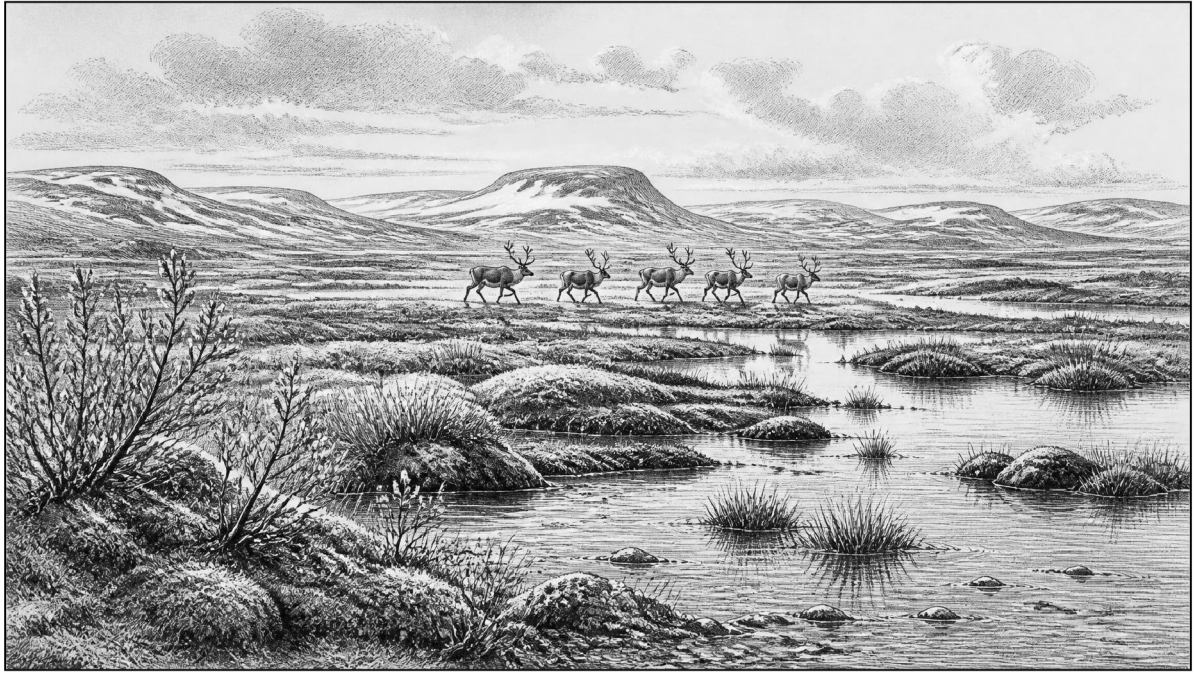
The Value of a Thin Record

The principal development around this notional year was environmental, not political: Ireland contained at least some non-glacial terrain during an unstable phase before the last ice sheet's major expansion. In Fermanagh, a freshwater wetland sustained tundra vegetation and small animal life between separate glacial episodes. In Cork, cave fauna show that cold-adapted large mammals entered the Irish landscape, while one reindeer bone raises the unresolved prospect of a very early human encounter. These records are precious precisely because they are thin. They replace invented certainty with a truer history of water, moss, insects, animals, advancing ice and the faint possibility of people at Europe's north-western edge.

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31039 BCE

Cork's Reindeer Before Maximum^[62]



The modern label 31,039 BCE should not be mistaken for an ancient Irish calendar date. No written chronology, annual layer sequence or securely datable human occupation lets historians identify an event in that particular year. It is more responsible to place the notional date within the later part of Marine Isotope Stage 3, a climatically unstable interval of the Late Pleistocene. The relevant Irish evidence is dated in broad radiocarbon and calibrated ranges, often with large uncertainties. It illuminates environments and animal communities over centuries or millennia, not named people, seasonal journeys or a single year.

Dating A Vanished Landscape

At this depth of time, the distinction between radiocarbon years and calendar years is essential. Radiocarbon ages measure the remaining carbon-14 in once-living material; they must be calibrated against independently dated records because atmospheric carbon-14 has varied. A reported age of 30,500 radiocarbon years before present, for example, cannot simply be converted by subtracting from 1950. Calibration produces a probability range rather than a precise historical year. The requested date lies broadly within the chronological territory of several Irish Late Pleistocene archives, but it cannot be attached to a particular stratum, animal death or human action.

Ireland was then part of the wider north-west European world, not yet the familiar island of later history. Sea level was substantially lower than today, and the shape of coastlines, river valleys and connections to Britain altered repeatedly as ice sheets and oceans changed. Yet a lower sea level did not automatically make travel easy. Routes could have involved exposed plains, river systems, sea crossings, ice margins and terrain subject to severe weather. The evidence does not allow a map of a dependable route into Ireland at this particular point.

The period came before the peak of the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest known extent in the later interval, broadly around 27,000 to 23,000 calibrated years before present in many reconstructions. That does not mean that Ireland at c. 33,000 years ago was mild or uniformly ice-free. Ice extent changed regionally; cold, snow, permafrost-like ground conditions and glaciers shaped different districts in different ways. Later ice also eroded, buried and rearranged much of the older archaeological landscape.

Derryvree's Freshwater Interval

The strongest environmental evidence relevant to this broad date comes from Derryvree near Maguiresbridge, County Fermanagh. Road works in 1969 exposed freshwater silts and fine sands enclosed between two thick till sheets in a drumlin. Till is debris laid down by glacier ice. The sequence therefore establishes an important relative order: glacial conditions had affected the locality, a freshwater environment developed there, and renewed ice later sealed the deposit beneath further till. It is a record of environmental change, not a settlement layer.

Organic material from Derryvree yielded a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 years BP. Calibrated estimates place the deposit broadly in a range of roughly 36,900 to 31,700 calibrated years BP. That broad span overlaps the notional era represented by 31,039 BCE. It cannot, however, establish that the wetland existed in precisely that numbered year, nor prove that conditions in Fermanagh were duplicated throughout Ireland.

The fossils indicate a cold, open and largely treeless landscape. Herb pollen was poorly preserved, but plant macrofossils, mosses and insect remains were revealing. Sedges and grasses, bogbean, water-milfoil, dwarf willow, mountain-avens and lesser clubmoss point to shallow water, wet ground and low vegetation adapted to a harsh climate. Researchers have described the setting as a tundra or muskeg-like mosaic: pools and saturated margins within exposed country, with a short growing season and severe winters. This was not an empty ice desert. It was a living freshwater habitat, though a demanding one.

That qualification matters. Derryvree demonstrates that a particular part of Fermanagh supported freshwater life between glacial episodes. It does not demonstrate an unbroken, hospitable Ireland, a forested refuge or a population living beside the pools. Equally, the later burial of the deposits warns against treating the absence of campsites as conclusive proof that no people ever passed through the wider region. Ice can preserve selected pockets of evidence while removing or concealing extensive surfaces.

Castlepook's Mixed Fauna

For the animal world of southern Ireland, Castlepook Cave near Doneraile, County Cork, is especially important. Excavations and later re-examination of its collections have produced remains of reindeer, mammoth, giant deer, brown bear, wolf, fox, hare, lemmings and spotted hyaena. Together these animals show that Ireland was connected ecologically to the cold-stage faunas of Britain and continental Europe during parts of the Late Pleistocene. Reindeer and lemmings favour open, cold environments; mammoth and giant deer evoke extensive grazing landscapes; hyaenas and wolves show that large carcasses were contested resources.

But Castlepook is not a snapshot. Its narrow limestone galleries, sands, stalagmite floors and disturbed older collections contain material accumulated at different times and by different agencies. Carnivores may have dragged bones into the cave; water, collapse and excavation may have moved them

again. Radiocarbon determinations on individual bones span many thousands of years. The fauna should therefore be read as evidence that these species occurred in Ireland across episodes of the Late Pleistocene, not as a claim that every listed animal stood together in one Cork valley in 31,039 BCE.

Re-dating work has strengthened the case that parts of the southern Irish fauna belong to Marine Isotope Stage 3, well before the Last Glacial Maximum. It also demonstrates how fragile older narratives can be. Mammoth, reindeer, giant deer and hyaena remains provide firm evidence of animal presence, yet the dating and depositional history of each specimen must be considered separately. The cave's greatest historical value lies in precisely this mixture of richness and difficulty: it preserves an extraordinary archive while requiring restraint in interpretation.

The Human Question

A reindeer femur from Castlepook has been publicly presented as bearing a deep incision consistent with carcass processing by a sharp stone tool. If the modification was made by people while the bone was fresh, it would be a remarkable indication of Upper Palaeolithic activity in Ireland far earlier than the better-established late-glacial evidence from County Clare. Public heritage material has associated the bone with about 31,000 BC, but this should be treated as a broad, approximate placement rather than a precise calendar date.

The limits are as important as the possibility. The bone derives from an old cave collection rather than a modern excavation of a sealed hunting floor. Ireland has no securely associated hearth, dwelling, burial, human skeletal remains or unequivocal stone-tool assemblage of this age. A modified reindeer bone, even if accepted as humanly cut, can show only that somebody may have processed an animal. It cannot reveal whether a small party camped nearby, whether people visited once or repeatedly, how many travelled, or whether a population survived locally through later climatic deterioration.

There is consequently no responsible basis for describing an Irish polity, ruler, territory, diplomacy or warfare in this period. Nor can language, kinship, clothing, food-sharing rules or gender roles be recovered from the available Irish record. Comparisons with Upper Palaeolithic hunting peoples elsewhere in Europe may suggest possibilities, but they remain comparisons, not evidence for Ireland. The same caution applies to claims of ritual or religion: no Irish cave art, shrine, burial rite or portable artwork is securely attributable to this horizon.

Life, Movement And Resources

Where human presence remains unproven or fleeting, economy and trade must be considered in the narrowest sense. There is no evidence for farming, livestock, crops, metalworking, pottery, permanent villages or exchange networks in Ireland at this time. If people did reach the island, the marked reindeer femur suggests the practical use of animal resources: meat, marrow, hides, sinew and bone were potentially valuable to mobile hunter-gatherers. That is an inference from the anatomy of a butchered carcass and wider European practice, not proof of an Irish hunting economy.

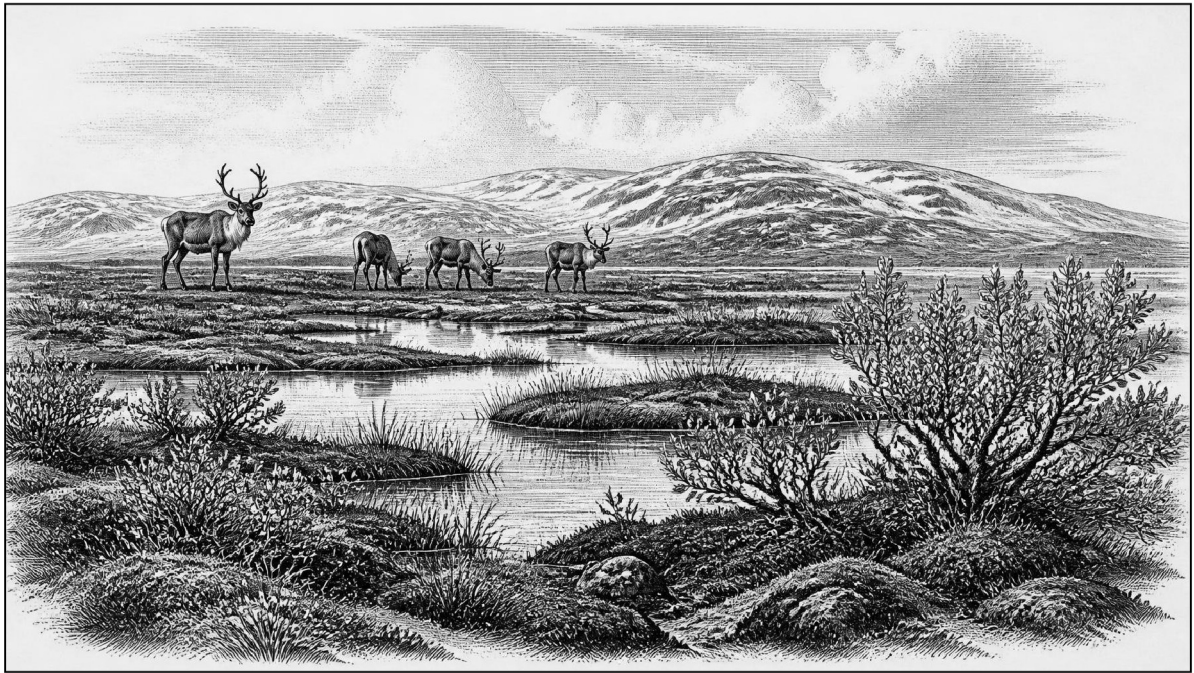
The animal evidence does support movement on a larger scale. Mammals colonised or recolonised Ireland during suitable cold-stage intervals, which implies changing geographical links and habitable corridors. Carnivores followed prey, while herbivores depended on forage across open ground. Such ecological movements were not diplomacy or trade, but they shaped the opportunities available to any human visitors. The later advance of major ice sheets would have disrupted these routes, transformed drainage and destroyed many places where people or animals might once have left traces.

Culture and learning are therefore represented most clearly by the modern scientific work needed to recover this deep past. Radiocarbon measurement, calibration, faunal identification, microscopic examination of bone surfaces, pollen analysis, plant macrofossils, insects, sediment stratigraphy and mapping of glacial landforms each provide a partial line of evidence. Their agreement can produce a persuasive reconstruction; their disagreement is equally informative. Around 31,039 BCE, Ireland's history is not a tale of kingdoms in formation. It is the history of a cold, changing landscape, of wetlands between ice advances, and of animals whose bones preserve a cautious possibility of human contact.

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31038 BCE

Derryvree's Ice-Age Fen^[63]



The label 31,038 BCE is a modern chronological convenience, not a date that can be matched to an Irish event, ruler, journey or settlement. No written record exists, and archaeological science cannot identify what happened in one particular calendar year so far back in the Late Pleistocene. The responsible approach is to place this nominal year within broad calibrated ranges and ask what deposits, fossils and landscapes can illuminate Ireland around it. The most useful evidence comes from Derryvree near Maguiresbridge in County Fermanagh, and from the cave-fauna assemblage at Castlepook near Doneraile in County Cork.

In calendar terms, 31,038 BCE falls roughly 33,000 years before present. It lies within Marine Isotope Stage 3, an unstable late-Ice-Age interval before the Last Glacial Maximum, when climate and ice margins altered repeatedly. Ireland was not a recognisable political country, nor a land of fixed borders or named peoples. Its history at this point is primarily environmental: a history of glaciers, sediment, freshwater, vegetation and animals, with only a tantalising and contested possibility of human activity.

A Date Within a Range

Derryvree provides the closest important chronological anchor. Roadworks in 1969 cut through a drumlin and exposed organic freshwater silts and fine sands trapped between two layers of till, the unsorted debris left by moving ice. The sequence matters as much as its contents. It shows that glacier ice had affected the place, that a period followed in which water and living things could occupy the site, and that renewed glaciation later sealed the deposit. This was not a continuously frozen, lifeless landscape.

Organic material from the Derryvree layer returned a conventional radiocarbon age of about 30,500 years before present, with a large uncertainty. Radiocarbon years are not calendar years: fluctuations in atmospheric carbon-14 must be corrected through calibration. Later discussion places the deposit broadly

at approximately 36,900–31,700 calibrated years before present, or about 34,950–29,750 BCE. The nominal year 31,038 BCE therefore sits within the wide calendar span that Derryvree can reasonably illuminate, but cannot be assigned to a particular sediment lens, season or generation.

That limitation is central rather than disappointing. The Derryvree bed cannot tell us that a particular plant flowered, animal drank, or person travelled there in 31,038 BCE. It can show that, during a broad interval encompassing that date, part of Fermanagh supported a freshwater wetland in a severe periglacial setting between episodes of local ice cover. It is an archive of conditions and change, not an annual chronicle.

Wet Ground in a Cold Land

The fossil evidence from Derryvree points to open tundra or muskeg: waterlogged, mossy ground with pools, sedges, grasses, herbs and low-growing shrubs rather than closed woodland. Pollen was poorly preserved, but plant macrofossils were more revealing. Mosses and cold-adapted species, including mountain-avens, dwarf willow, bogbean and aquatic plants, indicate that the basin held standing or slow-moving freshwater and supported vegetation despite harsh conditions. Such a place should not be imagined as a modern Irish bog transported unchanged into the Ice Age. It was a cold, exposed mosaic of wet ground, shallow pools, mossy surfaces and sparsely vegetated terrain affected by frost.

Seasonality was likely pronounced. Long, cold winters, repeated freezing and thawing, short growing seasons and strong winds would have limited tree growth. Yet the surviving plant record makes clear that the landscape was biologically active. Invertebrate evidence supports the same broad interpretation of damp, plant-rich ground with open water. The wider terrain may have appeared austere to modern eyes, but it contained local refuges where moisture, soils and low vegetation sustained life.

Regional variation must nevertheless be respected. Derryvree was one locality in what is now Northern Ireland, not a thermometer for the whole island. Coastal, upland and inland areas could differ markedly in exposure, drainage and proximity to ice. Ice-sheet reconstructions show major uncertainty at the beginning of this period; they suggest early centres of ice accumulation in northern Ireland and elsewhere across Britain and Ireland, while the fullest expansion lay ahead. The Irish landscape around this horizon was changing quickly enough that a single uniform map would mislead.

Castlepook's Animal World

For the animal life of the wider period, Castlepook Cave in north County Cork is indispensable. Antiquarian excavations there recovered remains attributed to woolly mammoth, reindeer, giant deer, brown bear, Arctic fox, wolf, mountain hare, lemmings and spotted hyena. Re-dating has shown that some bones once treated as comparatively recent are considerably older, placing important parts of the assemblage in Marine Isotope Stage 3, before the Last Glacial Maximum. Mammoth and hyena material has produced ages in the broad vicinity of the mid-thirties of thousands of radiocarbon years before present.

The cave is not a neatly sealed snapshot. Bones were accumulated through more than one process: carnivores dragged in carcass parts; animals died or sheltered in the cave; water moved material; and early excavations disturbed context. Individual specimens need not be contemporary. The assemblage nevertheless establishes an important fact: Ireland intermittently formed part of a north-west European cold-stage animal world capable of supporting large herbivores and formidable scavenging predators.

Spotted hyenas are especially revealing. A cave rich in chewed and fragmented bones is more likely to record a carnivore den or scavenging place than an undisturbed human camp. Mammoths and giant deer need not have been hunted by any people who may have been present; carnivores, natural death and later transport all offer explanations for bones in a cave. Reindeer, however, are well suited to cold open country, and their presence accords with the Derryvree picture of treeless, productive tundra-like habitats.

The Human Question

A reindeer femur from Castlepook has transformed discussion of this period. The bone has been publicised as approximately 31,000 BCE and carries a deep linear mark interpreted by zooarchaeologist Ruth Carden as a fresh-bone cut or chop made with a sharp stone tool during carcass processing. If that interpretation is confirmed, it would be remarkably early evidence that a person handled a reindeer in Ireland during the Upper Palaeolithic.

But the wording must remain conditional. A radiocarbon measurement dates the death of the animal, not automatically the moment at which a mark was made. Identifying a humanly made cut also requires taphonomic judgement, distinguishing tool damage from breakage, carnivore action and other alterations. Moreover, the femur derives from an old cave collection rather than a modern excavation of an intact occupation surface. No associated hearth, stone-tool assemblage, dwelling, burial, repeated food-processing area or securely dated camp of this age has been recovered in Ireland.

The most cautious conclusion is therefore modest but significant: the specimen is proposed evidence for a brief human encounter with a reindeer, not proof of a settled population. It cannot tell us whether people lived nearby, arrived on a short hunting expedition, scavenged an animal, or crossed the region only once. It does not establish a tribe, language, ancestry, seasonal round or population size. The later, securely evidenced human record in Ireland should not be projected backwards onto this much earlier and far less certain horizon.

Society Beyond the Evidence

There is no direct evidence for political affairs, diplomacy, formal leadership, warfare, religion, ritual, art, teaching or trade in Ireland around this nominal year. It would be misleading to invent them. If people did visit, comparisons with Upper Palaeolithic groups elsewhere in north-west Europe suggest that they would have relied on close social cooperation, portable possessions and practical knowledge of animals, weather and terrain. That is an inference from broader European archaeology, not an Irish fact demonstrated by Derryvree or Castlepook.

The same distinction applies to economy. A possible butchered reindeer bone could indicate the extraction of meat, hide, sinew, marrow or other useful material, but it cannot specify which resources were taken or how they were shared. There is no evidence for farming, herding, permanent villages, markets, long-distance exchange, boats or organised trade. Nor can we safely describe routes between Ireland and Britain. Lower sea levels altered coastlines, but the evidence discussed here does not document a particular crossing or connection.

What can be stated with confidence is that survival, whether of animals or of any small visiting human group, depended on responding to rapid environmental change. Freshwater basins such as Derryvree offered plant and invertebrate habitats; open terrain could sustain grazing animals; limestone caves could become shelters, traps, dens and long-term bone archives. These were ecological opportunities, but also vulnerable places as cold intensified and ice advanced.

Approaching the Great Ice

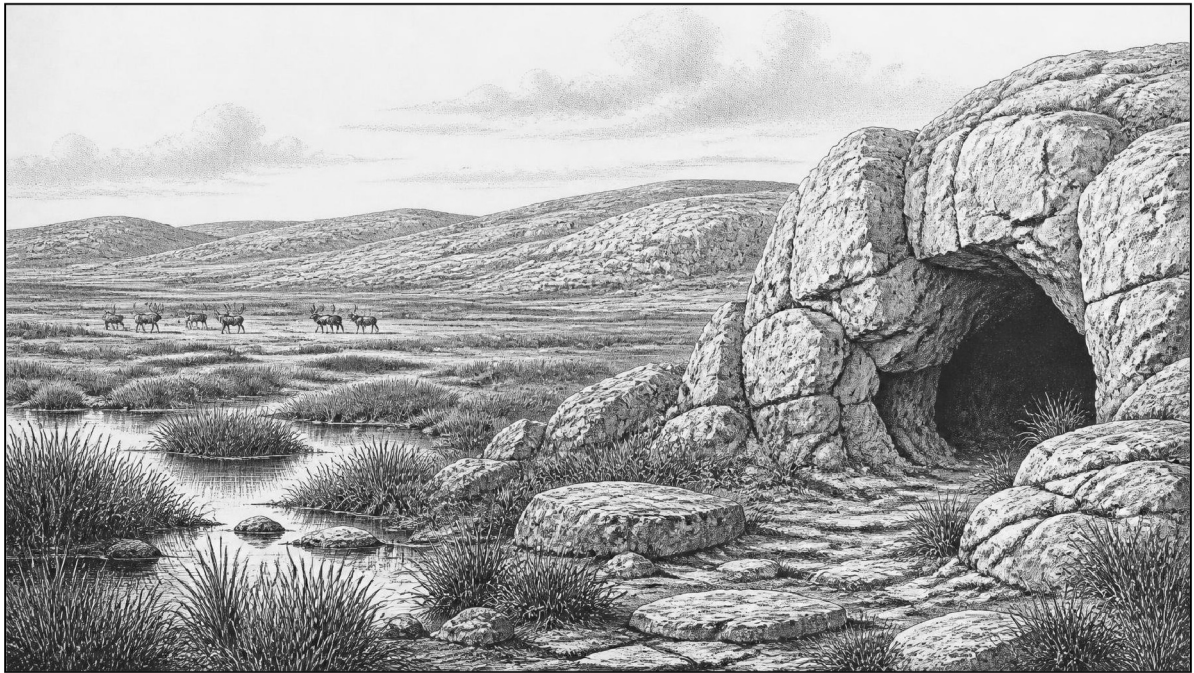
The great historical development around 31,038 BCE was not a battle or a dynasty but the approach of more extensive glaciation. Later ice sheets eroded, buried and rearranged much of Ireland's older landscape, which is one reason evidence for this interval is so fragmentary. Derryvree survived precisely because its organic sediments were protected beneath later glacial deposits. Castlepook survived because caves can preserve bones where open-air sites are lost.

Ireland at this point was neither an empty white wilderness nor a settled homeland known to history. It was a variable cold-stage landscape, locally wet and vegetated, visited by an unusual mixture of herbivores and predators. Its human story remains an open question centred on one exceptional reindeer bone. Its environmental story is firmer: mosses, sedges, shallow water, reindeer, carnivores and advancing ice together mark a precarious interval before the island was profoundly reshaped by the Last Glacial Maximum.

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31037 BCE

Awbeg's Deep Cave Record ^[64]



The label 31,037 BCE is a modern chronological convenience, not a date at which Ireland's prehistoric inhabitants recorded an event. It corresponds broadly to 33,000 calibrated years before present, but neither the archaeological nor the environmental evidence can be resolved to a single calendar year. Ireland at this point belongs to the Late Pleistocene, in the later part of Marine Isotope Stage 3, immediately before the most extensive phase of the last Irish Ice Sheet. What can be described responsibly is a changing world of cold climate, open country, cave-dwelling predators and mobile herbivores, with only a tantalising and still incomplete indication that people may have reached the island.

A Date at the Edge of Ice Growth

Modern reconstructions show that the British–Irish Ice Sheet grew rapidly after about 32,000 years before present, although its expansion was not simultaneous in every region. At its greatest extent, broadly between 27,000 and 23,000 calibrated years before present, ice covered Ireland and reached well beyond today's coast in several directions. The year represented here therefore lies near a threshold rather than in a settled climatic state: it was part of the long descent into the Last Glacial Maximum, not a moment when all of Ireland can simply be pictured beneath ice.

The most useful wording is deliberately regional. Some parts of Ireland may still have contained exposed, cold landscapes and habitats capable of supporting animals; elsewhere, ice masses were forming, advancing or influencing drainage and weather. Later glaciation profoundly altered the evidence. Moving ice eroded earlier surfaces, redistributed sediments and destroyed many open-air traces that might once have existed. That loss helps explain why caves, protected pockets of sediment and bones preserved in museum collections carry such disproportionate weight in any account of this period.

At Derryvree near Maguiresbridge in County Fermanagh, organic sediments lay between two tills: deposits left by ice occur below and above them. Their sequence proves a local order of events—glaciation, an interval in which freshwater sediments and vegetation accumulated, then renewed ice advance. A radiocarbon determination from this deposit, Birm-166, was published as $30,500 \pm 1,200$ radiocarbon years before present. That is a conventional radiocarbon result, rather than an annual calendar date; calibration and its substantial uncertainty prevent the bed from being assigned to 31,037 BCE precisely. It nevertheless illuminates the kind of cold, ice-free or ice-marginal interval from which the last Irish ice sheet emerged.

Fermanagh's Open Wetland

The Derryvree sediments preserve pollen, plant remains, mosses and small animal evidence. Together they indicate open, treeless vegetation around freshwater, rather than woodland. Sedges, dwarf shrubs and cold-adapted herbs belonged to a tundra or tundra-steppe mosaic shaped by short growing seasons, frost and exposed ground. Water was important: pools, shallow margins and saturated soils could sustain plants even where the wider terrain was bleak. This was not a featureless snowfield, but neither was it the green, wooded Ireland familiar today.

Such evidence is local, and it must not be made to speak for the entire island. A buried wetland near Fermanagh records conditions in its own basin over a span of time, not a national weather report for a particular year. Yet its importance is considerable. It demonstrates that Late Pleistocene Ireland contained ecological refuges and changing habitats before renewed full glacial conditions transformed much of the landscape. It also cautions against treating “the Ice Age” as a single unchanging freeze.

There were no fields, farm animals, villages or managed forests. Agriculture in Ireland belongs tens of millennia later. Food webs instead depended on wild plants and animals, seasonal growth and the movement of water, ice and grazing herds. People, if present, would have encountered a landscape in which shelter, fuel, fresh water and reliable animal resources were all unevenly distributed. The terrain itself was unstable in the long term: freeze-thaw action disturbed soils, rivers carried sediment, and expanding glaciers could erase or bury places that had briefly been usable.

Castlepook and the Reindeer Question

The strongest direct Irish evidence for animals in this broad period comes from Castlepook Cave, near Doneraile in north County Cork, in the Awbeg catchment. Excavations there, beginning in the early twentieth century, recovered a remarkable assemblage of Pleistocene fauna. It includes reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. These finds do not represent one simultaneous scene. Cave deposits may accumulate over long periods, bones can be moved by water and scavengers, and antiquarian excavation methods often recorded less contextual detail than a modern dig would require. Nonetheless, the assemblage establishes that southern Ireland was visited or inhabited at differing times by animals associated with open, cold environments.

Reindeer are particularly evocative. Their presence supports the picture of extensive open grazing country, while hyaenas and wolves show that large herbivores were part of a predator-rich ecosystem. A cave could be a den, a trap, a shelter used intermittently by animals, or a place where bones arrived through several processes. It should not be imagined automatically as a human dwelling. The named

chambers at Castlepook—such as Elephant Hall and Hyaena Hall—reflect the striking fossils found there, but the deposits require careful taphonomic investigation before stories of individual encounters can be securely told.

Recent redating has materially changed the discussion. Improved radiocarbon pretreatment has shown that some older Irish cave dates were too young, and Castlepook fauna belongs in part much earlier than formerly thought. One reindeer femur has been reported as dating to about 33,000 years ago and as bearing a deep mark consistent with cutting or chopping by a stone tool. If that interpretation, the bone's dating and the relationship between marking and deposition are all sustained, it would be the earliest known indication of human activity in Ireland by a very large margin.

But “if” matters. The bone is not a stone-tool assemblage, a hearth, a house floor, a human burial or a stratified camp. No human skeleton of this age has been recovered in Ireland. Nor has Castlepook yet yielded an unequivocal set of tools securely associated with the reindeer bone. A modification on a single bone is evidence potentially bearing on one action upon an animal carcass; it cannot establish a permanent population, a named people, a migration route or an ancestral connection to later inhabitants of Ireland. The prudent conclusion for around 31,037 BCE is that a human presence is possible and highly important, but remains far less securely documented than the animal world.

People Without a Recorded Polity

There is no evidence from Ireland at this date for political authority, territories, chiefs, warfare, diplomacy or formal institutions. Such categories depend on settlements, burials, material assemblages or written testimony that do not exist here. Likewise, there is no Irish evidence for religious monuments, images, music, language, ritual or learning. It would be misleading to fill those silences with practices known from much later prehistoric Ireland, or to import cave art and elaborate Upper Palaeolithic traditions from continental Europe as though they had been demonstrated on this island.

Comparison can, however, define a cautious possibility. Across north-west Europe, *Homo sapiens* groups of the Upper Palaeolithic were mobile hunter-gatherers who made stone, bone and antler equipment, processed animals and maintained social connections across large territories. If humans reached Ireland in the Castlepook period, they may have belonged to similarly mobile communities. They would have needed practical knowledge of weather, animal movement, raw materials and safe routes. This is an inference from the wider European context, not a discovery of Irish camps or social customs.

The same caution applies to economy and trade. Hunting or scavenging a reindeer carcass is conceivable if the Castlepook mark is human-made, but a single bone does not reveal how food was shared, whether hides were used, how long people stayed, or whether they travelled with companions. There is no direct evidence for exchange networks, marine travel or a land route into Ireland at this exact time. Lower sea levels altered the outlines of the Irish Sea basin, but changing ice, water depth, coastlines and topography make simple claims of a walkable bridge unsafe. Any arrival route remains an archaeological question rather than an established fact.

A Landscape Before the Record Breaks

The decisive development around this notional year was environmental, not political: Ireland was moving towards the severe glaciation that would cover most or all of the island and remove many traces of what came before. The Derryvree wetland archive preserves a fleeting record of cold freshwater life

between ice advances. Castlepook preserves the more dramatic animal evidence of the south, together with a provocative possible human intervention. Between them they show that Pleistocene Ireland was neither empty in every phase nor continuously hospitable.

For 31,037 BCE, then, the honest history is one of limits as well as discoveries. We can identify a cold and largely treeless Irish environment, open habitats capable of sustaining reindeer and other Ice Age mammals, and an ice sheet entering a major phase of expansion. We can report a disputed but potentially transformative reindeer bone from County Cork. We cannot name a community, reconstruct a settlement, describe a conflict or assign a ceremony to this year. The surviving evidence is fragmentary, time-averaged and often reworked—but it is sufficient to reveal Ireland as an active, changing frontier in the deep history of north-western Europe.

Chapter 065 of 100

31036 BCE

Castlepook's One Deep Mark ^[65]



“31,036 BCE” is a modern label placed on a time far beyond the reach of historical calendars. No person in Ireland marked this year, and no excavation can isolate an event, season or individual to it. In straightforward calendar arithmetic it falls about 32,985 years before AD 1950, the conventional “present” of radiocarbon dating: broadly around 33,000 calibrated years ago. That is an indicative position, not an anniversary. For Ireland, the responsible evidence is a set of dated ranges, fossil deposits and cave finds belonging to the later part of Marine Isotope Stage 3, a cold and exceptionally changeable interval within the last glacial cycle.

The most revealing evidence close to this notional point comes from two very different places: a buried freshwater deposit at Derryvree near Maguiresbridge, County Fermanagh, and the bone assemblage from Castlepook Cave near Doneraile, County Cork. Together they show that parts of the landmass now called Ireland could support cold-adapted plants and animals before the Last Glacial Maximum. One reindeer bone from Castlepook also raises the possibility of a fleeting human presence. It does not, however, demonstrate a settlement, a community or a continuous human population.

A Date Without a Diary

The precision of the year should not deceive. Radiocarbon measurements are reported in years before 1950 and must be calibrated because atmospheric carbon-14 has varied through time. At around 33,000 years ago, a radiocarbon determination commonly converts into a broad and sometimes discontinuous range of calendar probabilities, rather than a single year. Sediments may additionally have formed over many seasons or centuries, while bone dates establish when an animal died, not necessarily the moment when a bone was moved, gnawed, marked or recovered.

Derryvree provides the clearest Irish environmental bracket. Roadworks exposed organic freshwater silts and fine sands caught between two tills: deposits left by glacier ice. The sequence establishes a relative order that is stronger than any one numerical reading: an earlier glaciation, an interval in which freshwater sediments and organic matter accumulated at the site, and a later return of ice. The original radiocarbon result, Birm-166, was $30,500 \pm 1,100$ radiocarbon years BP. Subsequent discussion has placed its calibrated span broadly at c. 36,900–31,700 cal BP. The nominal year 31,036 BCE falls near the younger side of that wide environmental window, but cannot be pinned to a particular layer or moment within it.

An Open, Cold Landscape

The Derryvree sediments preserve pollen, plant macrofossils and insects rather than an ancient view of the whole island. Even so, they give a vivid local picture. The vegetation was treeless or almost treeless: grasses, sedges, herbs, mosses and low shrubs grew around wet ground and open water. Aquatic and wetland plants show that pools or sluggish freshwater existed, while beetles and other insects point to a mossy, plant-rich wetland often described as muskeg. This was no prehistoric forest and no uniform snow desert. It was a patterned tundra landscape, with saturated hollows, sedgy margins, exposed mineral ground and seasonally severe weather.

Interpretation must remain local. Derryvree lay in what is now Fermanagh, and its buried basin cannot supply a weather report for every coast, valley and upland. Yet it confirms an important point: Ireland was not simply sealed beneath permanent ice throughout the whole later Pleistocene. Ice margins advanced and retreated through the wider region; ice-free or less glaciated intervals allowed water, soils, plants and animals to occupy particular places. Speleothem growth in Crag Cave, County Kerry, provides independent evidence that warmer interstadial pulses during Marine Isotope Stage 3 sometimes allowed liquid water to percolate through cave systems. Such episodes were interruptions in a cold world, not a return to Holocene conditions.

At this date Ireland was also physically unlike the modern island. Lower global sea level exposed far more of the continental shelf. The Irish Sea basin, channels and coastal plains had different outlines, and connections across the surrounding region could be easier at certain times than they are now. That does not mean there was always a simple, dry land bridge from Ireland to continental Europe. The geometry changed with sea level, ice extent and local topography. What can safely be said is that animal movements into and out of Ireland were possible during favourable phases, and that the fauna belongs within a wider north-west European cold-stage world.

The Cave at Doneraile

Castlepook Cave is the other essential archive. Early twentieth-century excavators recovered a remarkable assortment of Pleistocene animal bones there, and later research directly dated selected specimens. The Irish Quaternary Fauna Project showed that mammals reached Ireland during the period from at least about 45,000 to 20,000 years ago. Castlepook's assemblage includes reindeer, mammoth, giant deer, brown bear, wolf, Arctic fox, hare, lemmings and spotted hyaena among material accumulated over a very long timespan. It is evidence for changing animal communities, not a single simultaneous menagerie.

Later redating has made that warning especially necessary. Improved pretreatment of bone collagen produced dates for some Castlepook specimens substantially older than earlier results, and researchers have stressed that cave deposits were disturbed by excavation, carnivore activity, water, frost and other natural processes. Giant deer and spotted hyaena, for example, may have disappeared locally before the Last Glacial Maximum; their presence in the archive does not prove that either stood beside a reindeer at the exact point represented by 31,036 BCE. Reindeer are the safest emblem of the broad landscape: herd animals suited to open, cold country and capable of seasonal movement across very large ranges.

Carnivores mattered to how the record was made. A cave can preserve bones because predators drag in limbs and carcass fragments, because animals shelter or die there, or because water rearranges material. Hyena teeth and scavenging could alter bones in ways that must be distinguished from human tools. For this reason Castlepook is as much a lesson in taphonomy—the history of what happened to remains after death—as it is a catalogue of Ice Age animals. The cave’s value lies precisely in its difficulty: its material preserves a rare glimpse of Ireland before the great expansion of the British–Irish Ice Sheet, but does not provide a neatly sealed campsite.

The Reindeer Femur

One object nevertheless deserves special attention. A reindeer femur from Castlepook bears a deep linear mark that zooarchaeologist Ruth Carden has interpreted as the work of a sharp stone tool used during carcass processing. County Cork heritage publications associate the specimen with about 31,000 BC. If that interpretation and broad dating are upheld, the mark is the earliest currently claimed indication that people handled an animal in Ireland, far earlier than the securely documented post-glacial human record.

Its importance is real, but its limits are equally real. The bone is not accompanied by a securely excavated hearth, stone-tool assemblage, dwelling floor, burial, food cache or concentration of matching butchered remains. Its old collection context prevents archaeologists from reconstructing the place of cutting, the number of people involved, their route or their duration of stay. A date on the bone gives the age of the animal’s death; it does not independently date the incision. The mark itself requires microscopic and comparative judgement to separate a stone-tool action from damage caused by carnivores, trampling or post-depositional processes.

The best conclusion is therefore deliberately modest. Castlepook may preserve evidence of a brief Upper Palaeolithic visit or hunting episode, perhaps by people moving with or intercepting reindeer herds. It cannot establish that hunters lived permanently in Ireland, formed a local society or left descendants there. No named group, language, political authority or ritual practice can be recovered from this single trace. The next major ice expansion would have transformed and in many places erased the landscapes on which any such visitors travelled.

Life Beyond Historical Categories

Political affairs, diplomacy and warfare cannot be written for Ireland at this depth of time. There are no polities, leaders, boundaries, monuments or written traditions to identify, and no evidence that a resident population existed. The same restraint applies to religion, art and learning: neither a shrine nor symbolic object securely belonging to this horizon has been found in Ireland. Silence here is evidence of the limits of the record, not proof that any possible visitors lacked beliefs, skills or social ties.

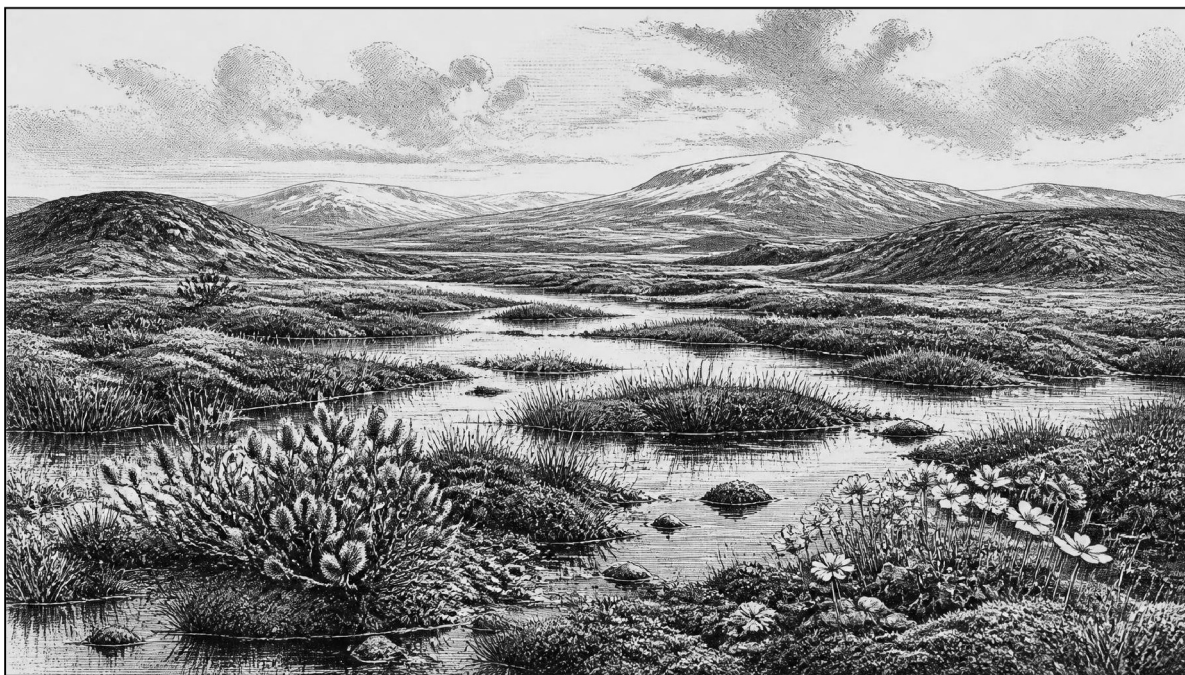
If people did reach the region, their economy would have been immediate and mobile rather than agricultural. They would have relied on knowledge of animal behaviour, weather, terrain, stone and fire, but Ireland has not yet yielded the tools or hearths needed to demonstrate those practices directly for this period. There was no farming, metalworking, village life or established trade network visible in the archaeological record. Any movement of people, raw materials or information across the exposed and changing lands around the Irish Sea remains an inference from regional geography and contemporary Upper Palaeolithic lifeways elsewhere, not an Irish find.

The most meaningful story for 31,036 BCE is thus ecological and evidential. Freshwater silts at Derryvree record a cold, open wetland during an ice-free interval; cave bones at Castlepook record the passage of large mammals through southern Ireland; one marked reindeer femur poses a carefully bounded human question. Around this nominal year, Ireland was not yet a historical society waiting to be named. It was a fluctuating glacial frontier whose sparse archives allow us to see tundra, animals, ice and perhaps one human action—no more precisely, but no less significantly.

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31035 BCE

Reindeer Femur, No Hearth^[66]



31,035 BCE is a modern chronological label, not a year that anyone in Ireland could have named or recorded. There was no writing, calendar, state, dynasty or recoverable oral history on the island from which to construct an annual narrative. Indeed, modern calendar-year precision is not available at this depth of time. The label corresponds roughly to 33,000 calendar years before AD 1950, the conventional ‘present’ used in radiocarbon reporting. What can responsibly be described is Ireland in the later part of the Late Pleistocene, during Marine Isotope Stage 3 (MIS 3): a long, unstable phase of the last Ice Age that preceded the fullest expansion of the British–Irish Ice Sheet.

A Date Inside Broad Ranges

Radiocarbon ages are not calendar years and must be calibrated against changing atmospheric carbon levels. At ages beyond 30,000 years, the resulting ranges can be particularly wide. The important Derrynvree deposit near Maguiresbridge, County Fermanagh, produced a conventional radiocarbon determination of 30,500 +1,170/–1,030 radiocarbon years BP. Scholarship has placed its calibrated age broadly in the later 30,000s to early 30,000s calendar years BP, a span that encompasses the modern label 31,035 BCE. That does *not* mean a particular layer, plant, animal or human action can be dated to that numbered year. It means that the deposit is a rare Irish archive for the environmental world broadly relevant to it.

Nor should the period be imagined as a single, island-wide climatic condition. Ice sheets advanced and retreated over very long timescales, while local terrain, altitude, exposure and drainage shaped conditions from one district to another. The latest large reconstruction of the British–Irish Ice Sheet identifies ice growth between about 31,000 and 26,000 years ago, followed by its greatest total volume

around 23,000 years ago. Thus Ireland around this notional date stood before, rather than at, the Last Glacial Maximum. Northern uplands may already have supported substantial ice, while other places retained ice-free or intermittently ice-free landscapes.

Derryvree's Buried Wetland

The most informative evidence comes from a road cutting made through a drumlin at Derryvree in 1969. Excavators found freshwater silts and fine sands sealed between two distinct tills: unsorted sediments laid down by glacier ice. The sequence supplies a powerful relative history. A glacier deposited the lower till; thereafter, at least locally, water and organic sediment accumulated in an environment not overridden by ice; finally, another glacial advance covered the deposit with upper till. It is not a photograph of all Ireland, but it proves profound landscape change at one carefully located Fermanagh site.

Pollen, plant macrofossils, mosses and animal remains from the inter-till sediments point to open, treeless tundra or muskeg-like wetland under periglacial conditions. Sedges, mosses, bogbean, water-milfoil, dwarf willow, mountain-avens and Arctic-alpine plant associates help reconstruct a mosaic of shallow freshwater, damp ground and sparsely vegetated drier surfaces. Pollen was poorly preserved, so individual species identifications and their abundance require caution. Yet the combined evidence is stronger than any single grain of pollen: Derryvree was neither temperate woodland nor a featureless field of ice when these sediments formed.

This was an austere but living landscape. Short growing seasons, frozen or seasonally frozen ground, strong winds and limited tree cover would have constrained plant growth. Pools and seepages could nevertheless support aquatic vegetation, invertebrates and birds, while mosses and sedges occupied saturated ground. The evidence supports ecological patchiness rather than an empty wasteland. It does not yield an exact annual temperature, snowfall total or season-by-season weather record, and it should not be stretched into one.

Caves and Cold-Stage Fauna

Southern Irish caves add a second kind of evidence. Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork, yielded an exceptionally important but complicated collection of Ice Age animal remains. Reindeer, giant deer, woolly mammoth, brown bear, wolf, fox, Arctic fox, mountain hare, collared lemming, Norwegian lemming and spotted hyaena are among the animals represented in the wider pre-Last Glacial Maximum record. Together they support the inference that open, cold grassland and tundra environments existed in parts of Ireland during MIS 3, capable of sustaining large herbivores and their predators.

The cave archive must not be treated as a single contemporaneous animal community. Early twentieth-century excavations removed very large quantities of bone, often before modern standards of stratigraphic recording, sieving and taphonomic analysis. Some deposits were disturbed or reworked, and individual specimens have different ages. Improved radiocarbon pretreatment has also demonstrated that several earlier Castlepook dates were substantially too young. The value of the cave lies in its accumulated record of changing Pleistocene fauna, but that same complexity limits claims about a particular moment or event.

The Marked Reindeer Bone

Castlepook is especially relevant because a reindeer femur has been publicly identified as dating to about 31,000 BCE and as carrying a deep mark interpreted by palaeozoologist Ruth Carden as having been made with a sharp stone tool during carcass processing. If both the age attribution and the interpretation of the mark are upheld, it would be remarkable evidence that Upper Palaeolithic people handled a reindeer in Ireland during the broad period represented by this article. County Cork heritage material appropriately presents the find as a potentially transformative clue rather than a complete prehistoric settlement story.

The limits are as important as the possibility. A radiocarbon determination dates the death of the animal represented by the bone, within a range; it does not automatically date a surface mark. Identifying a cut mark requires separate zooarchaeological judgement, including distinction from carnivore damage, trampling, sediment abrasion, excavation damage or later handling. Most importantly, Castlepook has not produced a securely associated stone-tool assemblage, hearth, dwelling floor, burial, repeatedly used camp or intact kill site of this age. A bone could have entered a cave after scavenging or other natural movement. It cannot by itself establish where an animal was killed, how many people were present, whether they were resident, or whether they returned.

This caution matters because the National Museum of Ireland has long described the Palaeolithic human record as lacking clear evidence, whereas the re-examined Castlepook femur has reopened that question. The more securely published evidence for human activity in Ireland remains much later: a butchered brown-bear patella from Alice and Gwendoline Cave, County Clare, dated to about 12,810–12,590 calibrated BP. The Castlepook specimen should therefore be understood as an important, currently limited indication of possible much earlier human visitation, not evidence for a continuous Irish population from 31,035 BCE onward.

No Politics, but a Connected Fauna

There is no evidence from Ireland at this date for political institutions, rulers, warfare, diplomacy, collective monuments, organised religion, formal learning or trade. Nor is there evidence for farming, pottery, metalworking, built villages or a settled economy. If people did visit, the marked femur would suggest hunting or carcass processing by mobile foragers using a sharp stone edge. It would not reveal their language, kinship system, beliefs, ancestry, route of arrival or relations with other groups. Those subjects belong to interpretation, not recoverable Irish evidence.

Animal movement does show that Ireland was not biologically isolated throughout the broader MIS 3 interval. Mammals reached the island during phases of lower sea level and changing ice configuration, but the exact routes varied and remain debated. Lower sea level alone does not prove a walkable land bridge at this particular point in time: ice, rivers, coastlines and sea channels all mattered. The faunal record demonstrates connections over long spans, not a mapped crossing on a specific day. It also warns against projecting the geography of modern Ireland backwards without qualification.

An Environmental History

The central development around 31,035 BCE was therefore environmental. In Fermanagh, freshwater sediment accumulated amid cold open vegetation during an interval between glacial episodes. In the south, cave deposits preserve evidence of a cold-adapted fauna whose members included both herbivores

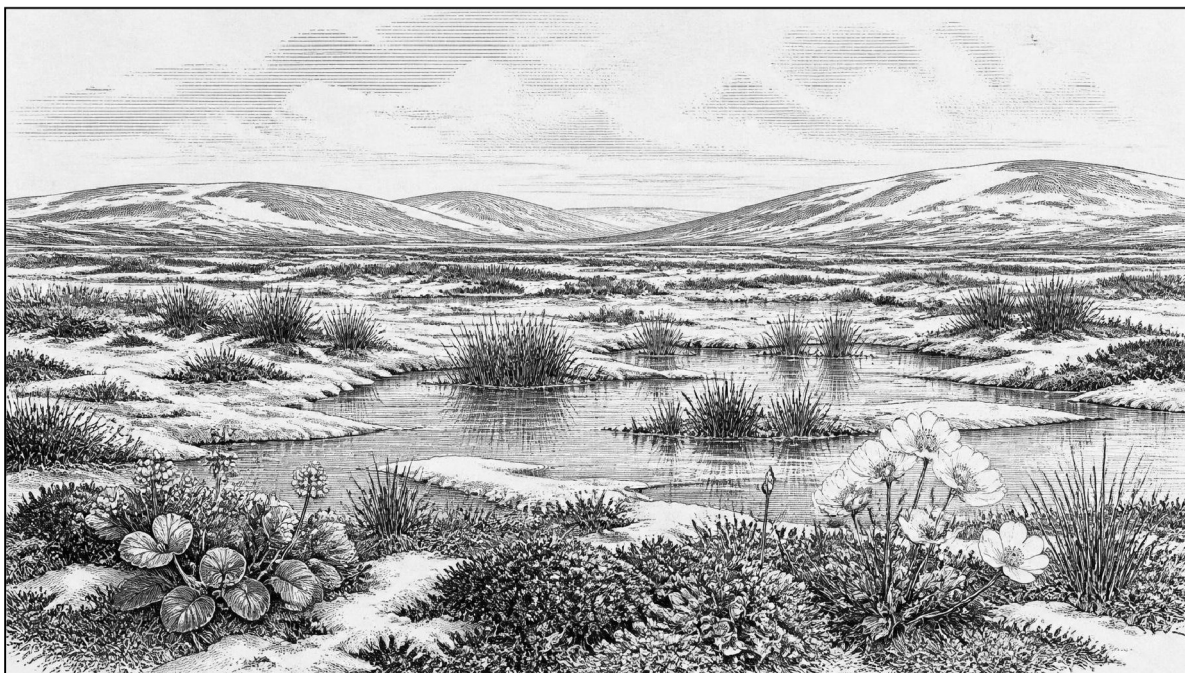
and formidable scavengers or predators. Across the wider region, ice was building towards a later maximum that would remodel landscapes, bury deposits and erase much of the archaeological record. Ireland's deep past here is not silent because nothing happened; it is difficult because ice, time and later disturbance preserved only fragments.

Those fragments still matter. Derryvree supplies direct evidence for a periglacial wetland; Castlepook preserves a changing faunal archive and a provocative marked reindeer bone. They allow a responsible reconstruction of habitats and possibilities, while setting firm limits on what is known about people. For this point in prehistory, the honest history of Ireland is one of tundra waters, migrating animals, advancing ice and an unanswered human question.

Chapter 067 of 100

31034 BCE

Derryvree's Trifoliate Fen^[67]



The label 31,034 BCE is a modern chronological convenience, not a date anyone living in Ireland could have recognised. There was no written calendar, no recorded event and no means of identifying a particular season, individual or community in that notional year. At this depth of time, responsible history must work with calibrated ranges, deposits and probabilities. The date falls at roughly 32,984 years before the radiocarbon convention of AD 1950, in the later part of Marine Isotope Stage 3 (MIS 3), a highly variable interval of the last Ice Age. It was before the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest known extent.

The closest Irish chronological anchor is not a settlement but a buried wetland at Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater sediments there returned a conventional radiocarbon age of 30,500 +1,170/–1,030 years BP. Calibration converts this into a broad calendar range, approximately 36,900–31,700 calibrated years BP. Thus 31,034 BCE falls within the possible span of the deposit, but it cannot be treated as the date of its beginning, end or any single layer. The evidence illuminates an interval around this point, not a year-by-year chronicle.

A Wetland Between Glaciers

Derryvree was exposed during road works in 1969, when investigators found fine sands and organic silts enclosed between two beds of till: the unsorted rock, clay and debris left by glacier ice. Its basic sequence is unusually eloquent. Ice had crossed the locality; subsequently the site supported fresh water, wet ground and plant growth; later ice again overran or expanded across it, sealing the evidence beneath a younger till. Much of Ireland's older land surface was removed, distorted or hidden by later glaciation, which makes this modest road-cut archive exceptionally valuable.

The fossils do not portray modern green Ireland. Pollen, plant macrofossils, mosses and insects indicate an open, predominantly treeless, cold-stage landscape. Sedges, grasses and herbs grew around shallow pools and saturated ground. The record includes bogbean (*Menyanthes trifoliata*), an aquatic plant whose three-part leaves gave this article its title, and mountain avens (*Dryas octopetala*), a plant now associated in Ireland with limestone uplands and cold-climate floras. Moss-rich ground, wet hollows and sparse vegetation support the interpretation of a tundra or muskeg-like environment, subject to seasonal frost and a short growing season.

This was not necessarily a white desert in every month, nor was it continuous fenland across the island. Derryvree records one local basin, and fossil pollen can travel beyond the place where a plant grew. The defensible conclusion is narrower: during an ice-free phase at this north-eastern locality, freshwater and wetland habitats sustained cold-adapted vegetation. Open ground and shallow water existed between episodes of glaciation. It does not follow that every Irish region had the same conditions, or that the whole island was simultaneously ice-free.

Ice, Water and Changing Coasts

At 31,034 BCE, Ireland lay within the long build-up to the Last Glacial Maximum rather than at the maximum itself. The timing and extent of ice before the maximum remain subjects of active research. Reviews of the British–Irish Ice Sheet commonly place its major MIS 2 build-up after about 35,000–32,000 years ago, with maximum extent broadly between about 27,000 and 21,000 years ago. Derryvree therefore belongs to a transitional world in which local ice-free environments could coexist with an expanding glacial system on the wider Irish and British landscape.

Sea level was lower than today because much water was stored in global ice sheets, but it would be misleading to picture an automatic dry-land bridge from continental Europe to Ireland. The Irish Sea basin, shifting ice margins, changing shorelines and possible marine barriers made access complicated. Animal movements demonstrate that mammals did reach Ireland during parts of the Late Pleistocene, yet the precise routes, frequency and duration of those movements cannot be reconstructed simply from a map of lower sea level. For people, the same uncertainty is still greater.

Environmental change was the principal force shaping regional life. Later ice would scour landscapes, reroute drainage and remove many traces of anything left on the surface. Caves, sheltered pockets of sediment and deposits sealed beneath tills are consequently disproportionate sources of evidence. Their survival explains both why the record is so fragmentary and why a few locations in Fermanagh, Antrim and Cork matter so greatly in discussions of Ireland at this time.

Animals in a Sparse Record

The Late Pleistocene fauna of Ireland was more varied than the later island fauna. Cave collections, especially from southern Ireland, contain remains attributed to animals including reindeer, giant deer, wolf, arctic fox, brown bear, lemmings, cave hyaena and, in some contexts, mammoth. Such finds show that cold-adapted and open-country mammals reached Ireland during the wider late-ice-age period. They offer an important corrective to any assumption that the island was always biologically isolated in the modern sense.

Yet these bones should not be assembled into a single, timeless menagerie. Cave deposits accumulated over long periods; carnivores carried remains into dens; water and sediment disturbed deposits; and many nineteenth- and early twentieth-century excavations did not record contexts to modern standards.

Improved collagen pretreatment and radiocarbon methods have also shown that some older dates need reassessment. The Irish Quaternary Fauna Project established the broad importance of the cave evidence, while more recent work has emphasised the need to revisit dates obtained before current laboratory protocols. Species from one cave may belong to different millennia, rather than a single living community.

For the period around 31,034 BCE, reindeer are especially evocative but should not be romanticised into vast herds crossing an unbroken plain. Their bones establish presence at some point within a broad chronology, not population size, migration season or the reliability of a particular hunting ground. The same caution applies to giant deer and predators. Faunal evidence is strong evidence for animal presence; it is weaker evidence for the precise ecology, abundance or human use of any given species.

The Castlepook Question

Castlepook Cave near Doneraile, County Cork, has become central to the question of whether people reached Ireland in this earlier part of the Upper Palaeolithic. The cave produced a substantial assemblage of Late Pleistocene animal bone, including reindeer. A reindeer femur from the historic collection has been publicly reported as carrying a deep mark interpreted as a cut or chop made by a sharp stone tool during carcass processing. County Cork heritage publications place the bone at roughly 33,000 years old, close in broad terms to the date considered here.

If that interpretation is upheld, it would be remarkable evidence that one or more people handled a reindeer in Ireland during MIS 3, much earlier than the well-established post-glacial settlement record. It would not, however, demonstrate a permanent colony, a village, a named people or a continuous ancestry to later Irish populations. The specimen derives from an old cave collection, not from a recently excavated occupation floor. No securely associated toolkit, hearth, constructed shelter, human burial or repeated concentration of butchered animals has yet been published for this episode.

There are two separate questions. Radiocarbon dating concerns when the animal died; surface modification analysis concerns what made the mark and when. A sharp incision can be consistent with stone-tool use, but the history of a cave bone also requires attention to carnivore action, sediment movement, breakage, excavation damage and later handling. The cautious formulation is therefore that Castlepook presents a potentially transformative indication of brief human activity, not settled proof of resident human society in Ireland in 31,034 BCE.

What Cannot Be Recovered

There is no evidence for political affairs, rulers, diplomacy, formal conflict, religion, language, art, learning, trade networks or social institutions in Ireland at this date. There is likewise no basis for describing houses, clothing, family structure, gender roles, ritual or diet as specifically Irish. These absences are historically meaningful. They reflect not merely a lack of writing, but the destruction and non-survival of fragile material during tens of millennia of climatic change and glaciation.

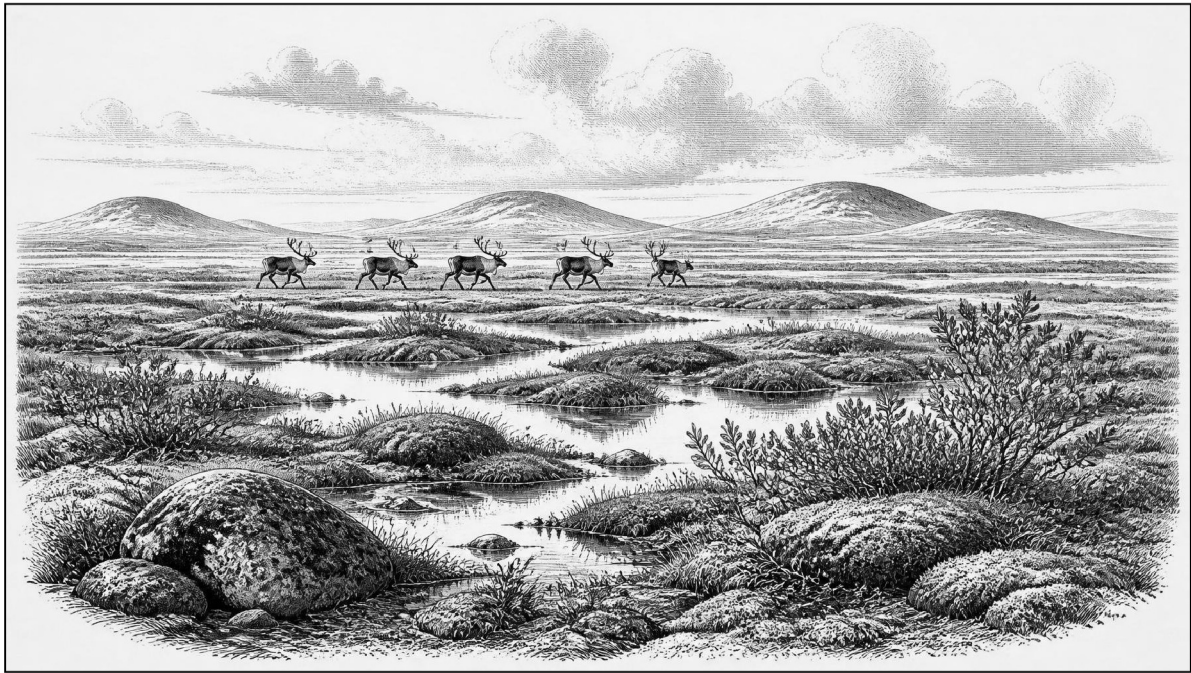
If people did visit, the practical setting suggests a mobile and precarious existence: an environment in which shelter, fuel, food and safe movement would have been seasonal problems. That is an inference from climate and landscape, not direct evidence from an Irish camp. It is safer to say that a fleeting party might have exploited an animal carcass than to supply them with a culture, route, economy or belief system for which Ireland has no surviving proof.

The strongest history of Ireland around this point is consequently environmental. Derryvree's buried freshwater bed records life persisting in a cold, open wetland during an interval between ice advances. Castlepook's fauna shows that large mammals reached the island, while a marked reindeer bone raises the serious but unresolved possibility of human contact. Together they reveal an Ireland shaped above all by ice, water, sparse vegetation and animal movement: a place with a deep past, but not yet a past that can responsibly be told as an annual human story.

Chapter 068 of 100

31033 BCE

BIRM-166's Moss Register ^[68]



“31,033 BCE” is a modern calendar label, not a date that can be recovered from Ireland’s archaeological record. Nothing allows historians to identify an event, a ruler, a journey or even a single season on the island in that particular year. The responsible way to approach it is through much broader scientific chronologies. In conventional terms, the label falls about 32,982 years before AD 1950, the reference point used for “before present” dating; calibrated radiocarbon ranges, however, are often centuries or millennia wide at this depth in time. Ireland was in the later Pleistocene, within the climatically volatile Marine Isotope Stage 3, and was moving towards the much more extensive glaciation of the Last Glacial Maximum.

The evidence is fragmentary but important. Buried wetland sediments at Derryvree near Maguiresbridge, County Fermanagh, and animal bones from Castlepook Cave near Doneraile, County Cork, show that parts of Ireland supported cold-stage ecosystems before later ice sheets altered and in many places erased the landscape. They do not, by themselves, demonstrate a settled human population. Indeed, the possibility of people in Ireland at this early date rests principally on one debated but potentially momentous bone mark rather than on a securely excavated camp, tool assemblage, hearth or burial.

A Date Without a Year

The most useful Irish chronological anchor is the Derryvree freshwater deposit, exposed during road works in 1969 within a drumlin. Organic silts and fine sands lay between two distinct tills: sediments left by ice. That simple stratigraphic relationship is powerful. It establishes that, at this Fermanagh location, an earlier ice advance was followed by an ice-free interval in which freshwater and wetland deposits accumulated, before another glacial advance buried and sealed them. A conventional radiocarbon

measurement, BIRM-166, returned 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. It should not be mechanically translated into a single BCE year. Modern calibration places it broadly in the middle of the last glacial cycle, approximately around 35,000–37,000 calibrated years BP, with substantial uncertainty.

That range is directly relevant to 31,033 BCE as a point within a much wider prehistoric horizon, but it is not proof that the Derryvree plants were growing in that named year. Nor does a deposit in Fermanagh describe every part of Ireland simultaneously. Radiocarbon dates measure the age of sampled carbon; calibration curves, laboratory uncertainties, sample histories and the nature of old deposits all limit precision. The lesson is methodological as well as chronological: prehistoric Ireland at this depth is reconstructed from overlapping ranges, not annual entries in a chronicle.

A Treeless Wetland World

Derryvree nevertheless gives a rare, close-range view of an Irish environment later hidden beneath glacial sediment. Its organic layers contained poorly preserved pollen, plant macrofossils, mosses and small animal evidence. The assemblage has been interpreted as open tundra or muskeg: wet, mossy and sedge-rich ground, with shallow freshwater and sparse dry-land vegetation rather than woodland. Cold-tolerant plants, including mountain avens, dwarf willow, Arctic clubmoss and bogbean, have been central to that reconstruction. Such species do not yield a picturesque, uniform “Ice Age landscape”; rather, they indicate a mosaic of saturated hollows, pools, exposed mineral ground and low vegetation.

This was a periglacial environment. That term does not mean that every square mile was covered by glacier. It describes ground affected by severe cold, seasonal freezing and thawing, limited tree growth and physically unstable soils. Wind, frost and water would have mattered greatly. In a country now associated with green pasture, hedgerows and damp Atlantic woodland, the closest responsible image is an open, low-lying cold-steppe and wetland landscape, exposed to harsh weather and with little shelter beyond local landforms.

Climate was not stable. The North Atlantic during this part of the last glacial period experienced abrupt shifts, and regional ice masses were expanding and changing behaviour. Later evidence shows that the British–Irish Ice Sheet reached its greatest overall extent roughly 27,000–23,000 calibrated years BP, covering Ireland and its continental shelf far more completely than at Derryvree’s wetland interval. Around the notional year considered here, the crucial historical development was therefore not a political episode but environmental instability: habitable patches of cold country existed in a region increasingly vulnerable to renewed ice-sheet growth.

Castlepook and the Human Question

At Castlepook Cave, in the limestone country north of the Blackwater in County Cork, collections made during antiquarian and twentieth-century investigations preserve bones of an unexpectedly varied Pleistocene fauna. Radiocarbon dating by the Irish Quaternary Fauna Project showed that some specimens belonged to very different periods, a warning against treating the cave as a single sealed deposit. Reindeer, brown bear, giant deer, mammoth, spotted hyaena, wolf, Arctic fox and lemmings are among the animals represented in the wider cave record. Individual bones provide firm evidence that particular species reached Ireland at particular broad times; they do not prove that all met one another, or humans, in one place on one day.

A reindeer femur from Castlepook has brought this cave into the public history of Ireland's earliest possible people. It has been assigned broadly to about 31,000 BCE in heritage interpretation and carries a deep surface incision that zoologist Ruth Carden has interpreted as a cut made by a sharp stone tool during carcass processing. If that interpretation is sustained, it would indicate a human visit to Ireland far earlier than the established Mesolithic settlement record and could represent evidence of hunters processing reindeer in the wider Doneraile landscape.

But the necessary cautions are unusually important. The bone is not a stone tool, and the cave did not preserve it in a modern, tightly documented archaeological excavation. Its recovery history and mixed faunal deposits make context difficult. A date on the bone establishes when the reindeer lived, not the exact moment of marking; the mark's human origin is an expert interpretation rather than an independently excavated occupation surface. No associated hearth, dwelling, butchered assemblage, weapon point, human remains or stratified lithic collection has yet demonstrated a resident Palaeolithic community in Ireland at this time. The claim is significant precisely because the surviving evidence remains so slight.

Animals, Movement and Risk

The animal record makes the landscape more legible. Reindeer are well suited to open, cold country and may have travelled in herds across large ranges. Their presence is compatible with a seasonal world of grazing, movement and predation, not with a settled pastoral economy. Mammoth and giant deer remains testify to the broader Ice Age fauna known from Irish cave collections, while hyaena and wolf bones remind us that carcasses could be scavenged, transported and modified by non-human predators. Caves were often carnivore dens, traps or natural repositories as well as possible places of human shelter. A bone found within one is not automatically evidence that people lived there.

Lower global sea levels changed the geography of north-west Europe, exposing areas now submerged around Britain and Ireland. Yet it would be misleading to draw a simple permanent land bridge from the continent to every Irish shore. The shape of coastlines, ice margins, rivers and sea passages altered through time, while animal dispersal routes differed by species and season. The evidence supports mobility across a changing wider region; it cannot map a definite route taken by a particular hunting party. If humans did reach Ireland, they were likely highly mobile hunter-gatherers operating within that larger north-west European world rather than founders of a continuous island population.

No Politics, No Proven Trade

There is no evidence for political institutions, diplomacy, warfare, named communities, formal religion, farming, craft specialisation or trade in Ireland around this date. Those subjects cannot responsibly be filled with analogy from later Mesolithic, Neolithic or Iron Age Ireland. Nor can language, ethnicity or ancestry be assigned. Even the word "society" must be used cautiously: a possible butchery mark may point to one human action, but it cannot reveal group size, kinship, leadership, belief or custom.

Everyday life, if people were present, would have been structured by obtaining food, avoiding exposure and negotiating a dangerous terrain shared with large herbivores and carnivores. Reindeer carcass processing would imply knowledge of animal bodies, cutting tools and the value of meat, fat, hide, sinew and bone. But that is an inference from hunter-gatherer practice, not a fact observed at Castlepook. No Irish evidence currently demonstrates which materials were taken, where a kill occurred, whether the cave was visited by hunters, or how long any visitors stayed.

An Ireland Repeatedly Rewritten by Ice

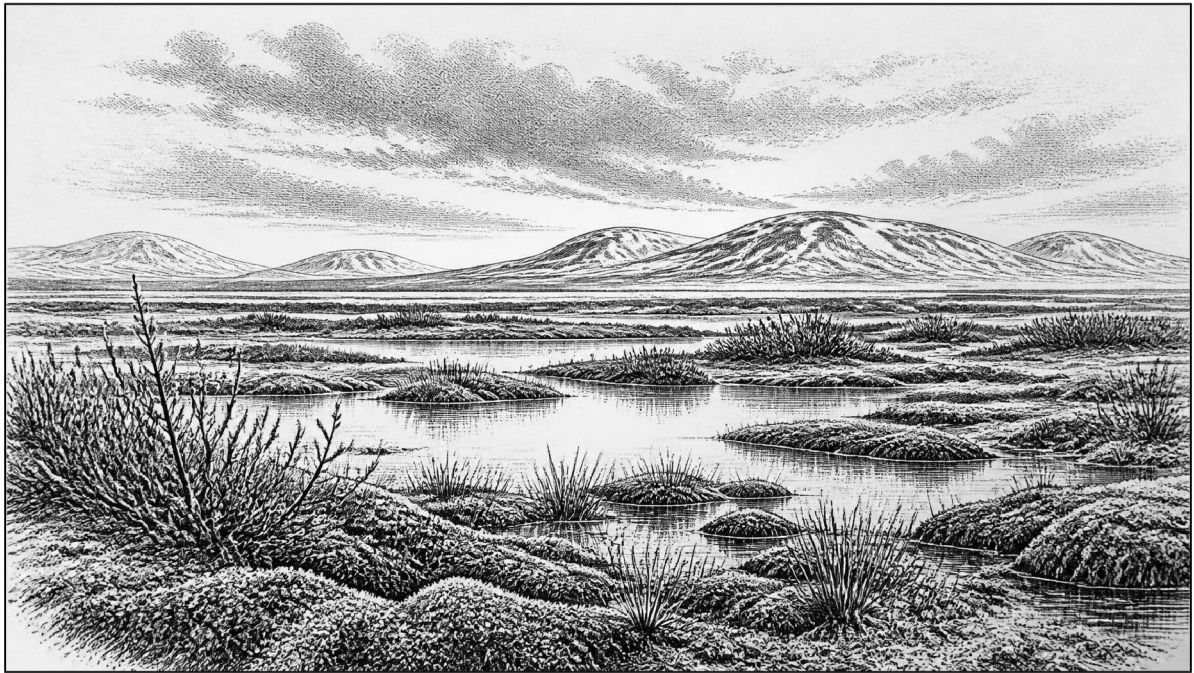
The absence of sites is itself historically meaningful, though not conclusive. Small mobile groups leave light traces, and later glaciers can erode, displace or bury them. Ireland's Pleistocene record is therefore biased towards caves, fossil bone accumulations, exceptional organic deposits and landforms rather than open-air settlements. Derrynvree survived because it was sealed between tills; Castlepook survived because limestone caves protected bones. Countless former surfaces, riverbanks and camps may have been destroyed or now lie beneath sediments or the sea. Equally, missing evidence cannot be converted into presumed settlement.

For 31,033 BCE, then, Ireland's history is the history of an unstable cold environment and of the evidence that outlasted it. Derrynvree records a treeless freshwater wetland in an interval between ice advances. Castlepook records Ice Age animals and a possible humanly made cut on reindeer bone. Together they make Ireland neither an empty white void nor a populated prehistoric homeland. They reveal a difficult northern landscape, intermittently accessible to animals and perhaps to people, whose local ecologies were soon to be transformed by the growing ice sheet.

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31032 BCE

Maguirebridge Between Tills^[69]



Modern calendar-year precision is not available for Ireland in 31,032 BCE. No written record, settlement sequence or securely dated human activity can identify a particular event, individual or season in that notional year. The label is a modern chronological convenience: roughly 33,000 calendar years before the 1950 reference point commonly used in radiocarbon dating. The responsible historical subject is therefore not a year of Irish affairs, but an interval within the Late Pleistocene, generally placed in Marine Isotope Stage 3 (MIS 3), when climate and ice cover in north-west Europe changed repeatedly.

The most informative Irish evidence close to this point comes from an unexpectedly modest place: Derryvree, near Maguiresbridge in County Fermanagh. There, sediments preserved beneath later glacial deposits record a cold but living freshwater landscape. Together with cave faunas from elsewhere in Ireland and wider reconstructions of the British–Irish Ice Sheet, they show why this was neither a familiar green island nor simply an unbroken white wilderness. They cannot, however, demonstrate a contemporary Irish population, political community or named culture.

Dating a Landscape, Not a Year

Derryvree was exposed during roadworks through a drumlin, one of the streamlined hills formed beneath moving ice. The section contained organic freshwater silts and sands between two tills: unsorted debris deposited directly by glacier ice. Its sequence is clear even if its absolute chronology is not. First ice laid down the lower till; then an ice-free or locally ice-free interval allowed water, plants and insects to leave their remains; finally, a renewed ice advance buried the deposit below another till.

Organic material from the series produced a conventional radiocarbon age of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. That is not the same as a calendar age. When older radiocarbon results of this kind are calibrated against modern Northern Hemisphere curves, they resolve into a broad range rather than one date; discussion of the Derryvree deposit places it broadly around 36,900–31,700 calibrated years BP. The interval overlaps the world represented by 31,032 BCE, but does not prove that every plant, insect or pool described at Derryvree existed in that exact numbered year. It is evidence for a phase of environmental history.

This distinction matters especially in the Ice Age. The climate was not static, and the Irish record has been heavily disturbed by later glaciation. Ice eroded older land surfaces, reworked sediment and sealed some rare deposits beneath fresh till. As a result, a single surviving organic bed can be immensely valuable, but it must not be forced to carry more certainty than it possesses.

A Treeless Wetland in Fermanagh

The Derryvree plant and insect evidence indicates an open, treeless muskeg or tundra-wetland environment. Mosses and sedges grew around shallow pools and waterlogged ground. Remains attributed to bogbean, water-milfoil, mountain-avens, dwarf willow, juniper and other cold-tolerant plants show that the vegetation was varied at a small scale: open water, muddy margins, mossy ground and low herb-rich patches could exist together. Such a mosaic is more precise than the blanket phrase “tundra”, though it was nothing like the later forested landscapes of Ireland.

The inference is climatic as well as botanical. The setting probably experienced long, severe winters, short growing seasons and ground affected by frost. Yet freshwater deposits and aquatic plants show that seasonal thaw and standing water occurred. The landscape was therefore biologically productive in restricted places. Insects, plants and small wetland habitats formed food webs; the evidence corrects any image of an entirely sterile terrain. It does not tell us the exact annual temperature, snowfall or length of a particular summer.

Regional comparison strengthens the point. Other inter-till organic deposits in northern Ireland, including sites at Hollymount, Greenagho and Aghnadarragh, demonstrate that cold-stage Ireland contained episodes and localities in which organic sediment accumulated between glacial events. Their environmental records differ in detail, but collectively show change rather than permanence. The ice sheet’s margins and thicknesses shifted over long timescales, while particular basins could briefly preserve water and vegetation.

Ice, Coast and Changing Geography

At about this stage of MIS 3, the British–Irish Ice Sheet was entering a complex period of growth and fluctuation before its later maximum. Recent reconstructions show that ice-sheet expansion was already under way in parts of the wider British–Irish region around 31,000 years ago, and that Irish ice expanded further after about 29,000 years ago. Earlier work also argues for repeated advances and retreats between roughly 40,000 and 25,000 years ago. The precise extent of ice across every part of Ireland at any moment remains debated, because later ice often destroyed the relevant evidence.

For Ireland, this means that a map for 31,032 BCE must be understood as provisional. Derryvree’s freshwater deposit demonstrates that at some point within its dated interval its locality was not under glacier ice. It cannot by itself establish that the whole island was ice-free, nor that every region shared its

conditions. In the south and west, the routes of expanding Irish and Irish Sea ice were governed by terrain and the surrounding continental shelf. In the north, connections with Scottish ice and changing marine conditions added further complexity.

Sea level was substantially lower than today because so much water was stored in continental ice sheets. But lower sea level did not make Ireland a simple land extension of Britain or continental Europe. The Irish Sea basin remained a major barrier, and any claim that people or animals moved easily over a continuous land bridge at this date would be unwarranted. Coastlines were different, exposed shelf landscapes were more extensive, and access changed through time; none of this supplies evidence for settlement or exchange across the sea in this particular period.

Animals and the Human Question

Cave deposits offer a second, more mobile view of Ice Age Ireland. Castlepook Cave in County Cork has produced Late Pleistocene remains including reindeer, red deer, mammoth, brown bear and spotted hyaena. Direct radiocarbon measurements on some bones place elements of this fauna broadly in the 35,000–34,000 radiocarbon-years-BP range, with other remains younger. These animals indicate that suitable habitats and prey-scavenger relationships existed in Ireland during portions of the Middle Midlandian cold stage.

They should not be imagined as a single herd or community living together at one time. Cave bone assemblages accumulate through different episodes: carnivores can drag prey into caves, animals may die naturally, sediments can move material, and early excavations did not always record context to modern standards. Mammoth and reindeer are important evidence of cold open-country faunas, while hyaena remains show that large carnivores ranged into Ireland. They do not automatically identify a human hunting economy.

The question of people requires particular restraint. No secure archaeological settlement, hearth, stone-tool assemblage or human bone demonstrates a resident human population in Ireland around 31,032 BCE. Reports of marks on a Castlepook reindeer bone have prompted discussion of possible human modification, but the claim remains contested and the evidence is too slight to establish an Irish Upper Palaeolithic occupation at this date. Better-supported evidence for human presence on the island belongs much later, in the terminal Pleistocene and Early Holocene. Ireland's earliest securely investigated post-glacial communities are later still, with Mesolithic settlement developing after environmental recovery.

No Politics, No Trade Network

Consequently, conventional headings such as political affairs, diplomacy, warfare, religion, learning and trade have no evidential content for Ireland in this period. There are no known rulers, territories, alliances, shrines, graves, languages, settlements or exchange routes that can responsibly be assigned to 31,032 BCE. Nor can the social lives of hypothetical visitors be reconstructed from nearby faunal remains. A reindeer bone or a layer of silt records an animal and a depositional history, not a constitution, ceremony or market.

That absence is itself historically significant. Ireland was not yet the inhabited, cultivated and socially organised island of later prehistory. If humans occasionally reached its shores during some Late Pleistocene interval, the present evidence does not allow their movements, numbers or relationships with animals to be described. The best account of everyday life is therefore ecological: shallow water

collecting in hollows; mosses and sedges growing at wet margins; insect life exploiting brief productive seasons; grazing and carnivorous mammals moving through open country; and advancing ice repeatedly remaking the terrain.

The Evidence Beneath Later Ireland

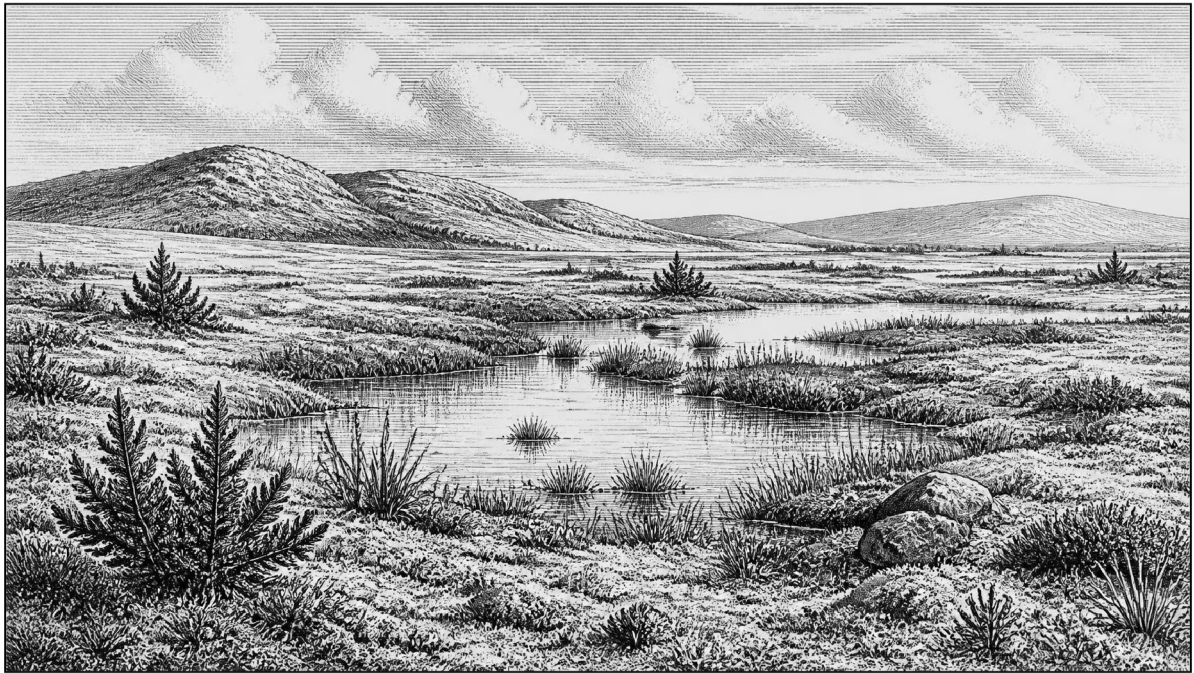
The enduring importance of Derryvree lies in its survival. Later glaciation covered the wetland with till, protecting a fragment of an older world while also making it difficult to discover. The drumlin landscape visible in modern Fermanagh is in part a legacy of those later ice movements, whereas the buried silts preserve a rare moment when the same district supported freshwater habitats between glacial episodes.

For 31,032 BCE, then, the most defensible picture is deliberately limited but far from empty. Ireland belonged to a climatically unstable Ice Age world. In at least some places and at some points within the relevant calibrated ranges, ice-free ground supported treeless wetland and open-country ecosystems. Large mammals inhabited parts of the island over the broader period. Human occupation, political organisation, religion and trade cannot be evidenced. The history of this date is not a lost chronicle awaiting discovery; it is a carefully assembled environmental record, read from mud, pollen, insects, bones and the ordering of sediments beneath the ice.

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31031 BCE

Derryvree's Sub-Drumlin Waters ^[70]



The label 31,031 BCE is a modern chronological convenience, not a year that people in Ireland could have named or recorded. No written calendar, settlement sequence or securely dated human event allows archaeologists to isolate this particular year. In radiocarbon terms it falls about 32,980 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), an unstable interval of the last Ice Age. The responsible account of Ireland at this point is therefore built from geological layers, fossils and scientific date ranges, rather than from rulers, battles or communities known by name.

A Date Inside a Range

The closest major Irish environmental record is at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks in 1969 cut through a drumlin and revealed a remarkable sequence: an older glacial till below, freshwater silts and fine sands containing organic material in the middle, and a later till above. This arrangement matters because it shows that local ice had withdrawn or was absent long enough for water, sediment, plants and insects to accumulate before another glacial advance buried the deposit.

Organic material from the Derryvree bed produced the radiocarbon determination Birm-166, 30,500 radiocarbon years before present, with a substantial error range. When calibrated, the deposit has been placed broadly at about 36,900–31,700 calibrated years before present. The modern date 31,031 BCE lies within that wide span. Yet the range must not be mistaken for a diary: the sediment formed over time, the radiocarbon result has uncertainty, and calibration converts a laboratory measurement into probabilities rather than a single anniversary. Derryvree can illuminate conditions around this era; it cannot tell us what happened on one day, season or named year.

Water Between the Ice Sheets

The evidence from Derryvree is direct evidence for an ice-free freshwater environment at that locality during part of the interval represented by its deposits. It is not proof that all Ireland was ice-free in 31,031 BCE. Ice margins changed across the island and surrounding seas, while older deposits were repeatedly eroded, overridden or concealed by later glaciers. The Irish record is consequently fragmentary, and regional reconstructions do not always agree on the precise pace or extent of early ice-sheet growth.

Nevertheless, the Derryvree plants and insects permit a careful reconstruction of the local setting. They indicate open, treeless tundra or muskeg: a cold, waterlogged landscape of mosses, sedges, grasses and herbs, with shallow pools and wet ground rather than woodland. Juniper pollen and other hardy plant evidence suggest scattered low vegetation. Insect remains point to a periglacial climate, meaning an environment shaped by severe cold, seasonal thaw and frozen ground, even where glacier ice itself was not standing. Summer growth would have been brief but ecologically important; meltwater and plant-rich pools could sustain small but productive wetland habitats.

This was not the evergreen, rain-softened Ireland familiar today. Winters were probably long and harsh, and the ground may have undergone repeated freezing and thawing. Treelessness also means that wind, snow movement and exposure were major forces in daily ecology. It would be misleading, however, to imagine a uniform white wilderness. Derryvree instead suggests a patchwork: silts, shallow freshwater, mossy ground, low vegetation and drier open surfaces, changing as water levels and temperature shifted.

An Unsteady Atlantic Climate

MIS 3 was climatically volatile. Greenland ice-core records show abrupt shifts between colder stadial phases and comparatively milder interstadials. Irish evidence is sparse, but broken speleothems from Crag Cave in County Kerry show episodes of calcite growth during this wider part of the last glacial period. Calcite could form only when water circulated through the limestone cave system under conditions less hostile than the coldest phases. That does not provide a weather forecast for 31,031 BCE, nor does it prove that Fermanagh and Kerry experienced identical conditions at the same moment. It does, however, support the larger interpretation that Ireland was affected by repeated environmental swings rather than a single, unchanging Ice Age climate.

These fluctuations formed the prelude to the Last Glacial Maximum. Later in the glacial cycle, roughly 27,000–23,000 calibrated years before present, the British–Irish Ice Sheet expanded across Ireland and much of its continental shelf. At the date considered here, that maximum lay in the future. The prospect of advancing ice is historically important because it would later transform the landscape, scour deposits and remove much evidence of whatever plants, animals or people had been present. Deep prehistory in Ireland is difficult partly because the ice itself became an agent of archival destruction.

Castlepook's Time-Mixed Fauna

In north County Cork, Castlepook Cave near Doneraile offers a second, very different archive. Excavations from the early twentieth century and more recent fieldwork have produced a notably rich collection of Late Pleistocene animal remains. Mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are among the animals represented in the wider cave assemblage. Their presence demonstrates that Ireland was, during favourable pre-maximum phases, part of a much broader north-west European faunal world.

The cave must be read with restraint. It was used and disturbed over long periods; carnivores could carry carcass parts underground, water and sediment could move bones, and early excavations did not record context to modern standards. A cave fauna is not a photograph of all species standing together beyond the entrance. Modern re-dating has also shown that some older radiocarbon results from southern Irish caves were too young because earlier laboratory methods did not remove all contamination. Several Castlepook animals may therefore belong earlier in MIS 3 than once thought, and not every specimen can responsibly be assigned to the decades around 31,031 BCE.

What can be said is more valuable than a forced certainty. Open-country herbivores such as reindeer fitted the tundra-like environments independently recorded in Fermanagh. Mammoth and giant deer attest to larger-bodied grazing and browsing fauna in Ireland during parts of the Late Pleistocene, while wolves and spotted hyaenas reveal predators and scavengers within the same broad ecological province. Their existence required routes of dispersal at some stage, but it does not demonstrate a permanent land bridge, a single migration route or continuous populations. Lower sea levels altered coasts and reduced distances, yet the means and timing of animal crossings remain questions for research.

The Human Question

One Castlepook find gives this period exceptional archaeological significance: a reindeer femur reported as about 33,000 years old and bearing a deep linear mark interpreted as damage made on fresh bone by a sharp stone implement. If that interpretation is confirmed, it would indicate that people reached Ireland far earlier than the securely documented post-glacial settlement record. It would be evidence for carcass processing, not automatically for a village, a lasting population or an established route of colonisation.

The caution is essential. The bone comes from an old, complicated cave collection; a single modified specimen is not accompanied by an excavated hearth, stone-tool assemblage, dwelling floor or human remains of comparable age. The proposed mark has great importance precisely because the evidence is so rare, and its anthropogenic interpretation requires continued specialist assessment. Recent excavations at Castlepook have sought intact, stratified Pleistocene deposits to improve the chronology and context. Until such evidence produces a clearer pattern, Ireland at this date should not be described as certainly settled.

No Politics, No Proven Trade

There is no evidence from Ireland around 31,031 BCE for political institutions, chiefs, warfare, diplomacy, territorial states or named peoples. Nor is there evidence for trade networks, farming, metalworking, pottery, permanent architecture, monuments, burial customs, religious practice, language or formal learning. These absences are not empty topics to be filled with comparisons from later prehistoric Ireland. They mark the boundary between what the surviving record supports and what it cannot recover.

If people were present, the most cautious inference is of a small, mobile hunting group able to use a sharp stone edge and to exploit animal resources in a difficult seasonal landscape. Even that is conditional on the Castlepook modification being confirmed as human-made. It cannot establish social organisation, belief or identity. The rich artistic and technological traditions of Upper Palaeolithic communities elsewhere in Europe show what was possible among contemporary human populations, but no such objects have been securely recovered from Ireland for this period. Continental analogy may supply context; it cannot substitute for Irish evidence.

A Landscape Before the Maximum

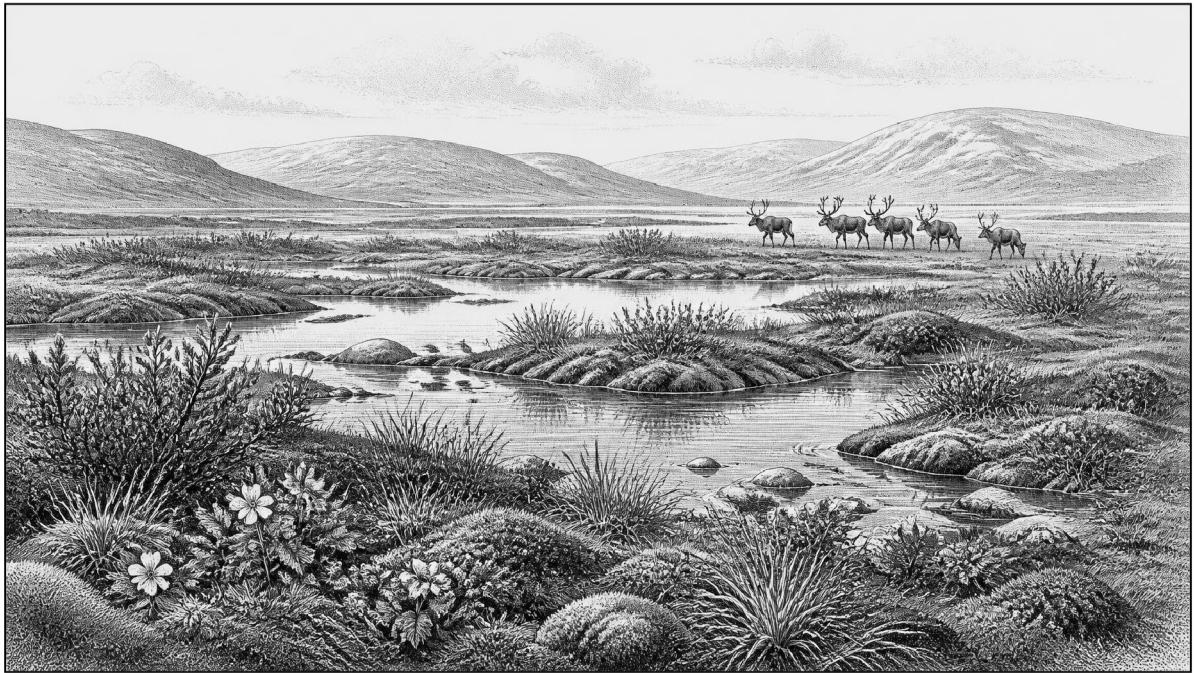
The central development around this notional year was environmental, not political: parts of Ireland retained or developed ice-free habitats during an increasingly severe glacial age. Derrynvree records cold freshwater and open vegetation beneath what would later become a glacially remodelled drumlin landscape. Castlepook preserves traces of animals that ranged into the island during the wider Late Pleistocene, while the possible cut-marked reindeer bone keeps open, but does not settle, the question of an early human visit.

Thus 31,031 BCE belongs to a history of ranges rather than events. Calibrated dates, silts between tills, cave bones, pollen, insects and cave calcite provide narrow windows onto an Ireland repeatedly altered by climate. They show an island or near-island landscape of tundra wetlands and mobile fauna on the eve of greater ice expansion. They do not reveal a kingdom, a people's name or an exact occurrence in that calendar year—and recognising that limit is the most accurate way to understand Ireland's deep past.

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31030 BCE

BIRM-166's Buried Freshwater^[71]



“31,030 BCE” is a useful filing label, not a date at which Irish history can be observed year by year. No calendar, writing, named individual or datable event survives from this depth of time. In conventional archaeological terms the point is roughly 32,980 calibrated years before present, with “present” fixed at AD 1950. It falls within the later part of Marine Isotope Stage 3 (MIS 3), during Ireland’s Midlandian cold stage. The responsible approach is therefore to describe a broad interval, using evidence with ranges rather than pretending that a particular winter, journey or encounter can be recovered.

The closest important Irish environmental sequence is Derryvree, near Maguiresbridge in County Fermanagh. Organic freshwater silts and fine sands exposed in a road cutting in 1969 produced the radiocarbon determination Birm-166: 30,500 radiocarbon years before present, with a large error range. Modern calibration places this evidence broadly within about 36,900–31,700 calibrated years before present. The notional year 31,030 BCE lies within that span, but cannot be assigned to a particular layer or moment in it. Derryvree is evidence for conditions over generations or longer, not a snapshot of a single year.

A Landscape Between Ice Advances

Derryvree’s special value lies in its physical setting. The freshwater deposits were trapped between two thick layers of till, the unsorted sediment left by glacier ice. In simple sequence, ice had occupied the locality; then an ice-free interval allowed water, sediment and organic remains to accumulate; later ice advanced and sealed the deposit beneath another till sheet. This makes the site a rare witness to a phase when at least part of Ireland was not continuously buried beneath glacier ice. It does not demonstrate that the whole island was ice-free at once, nor that every region shared Fermanagh’s exact climate.

The wider British–Irish Ice Sheet was growing and changing markedly during this period. Its eventual maximum was still to come, although different sectors advanced at different times. At around this notional date, Ireland was not a stable, familiar island landscape but part of a fluctuating north-west European glacial world. Lower sea levels altered coastlines and, at intervals, reduced the sea barriers between Ireland, Britain and the continental shelf. Yet the precise routes available at any one time depended on sea level, local ice margins, rivers and seasonal conditions. “Land bridge” should not be imagined as an easy road: it could have meant exposed, windswept terrain interrupted by watercourses, marshes and moving ice.

Tundra, Pools and Short Summers

The Derryvree fossils indicate open tundra vegetation and a periglacial climate: cold conditions shaped by repeated freezing and thawing near an ice-sheet margin. This was not a landscape of oak woods, hedges or peat bogs as later Irish generations would know them. Pollen and plant macrofossils point instead towards grasses, sedges, herbs, mosses and low-growing cold-adapted plants. Finds associated with the deposit include bogbean, dwarf willow, mountain avens and alternate water-milfoil. Together, they indicate that severe cold did not make the country biologically empty. Shallow freshwater, wet ground and summer thaw supported local plant communities.

Researchers have described the Derryvree setting as a treeless muskeg or wet tundra mosaic: saturated patches rich in mosses and sedges, open pools and sparse vegetation on better-drained ground. That reconstruction should not be converted into a picturesque certainty. Fossil remains are selective; pollen may be poorly preserved or transported; and a road-cut deposit samples a very small area. Nevertheless, the combination of sediments, seeds, mosses and pollen makes an open, wet, cold landscape much better supported than either a forested countryside or a featureless sheet of snow.

Other northern Irish deposits, including records from Aghnadarragh in County Antrim and Greenagho near Belcoo, show why regional caution matters. Their stratigraphy, insects, plants and dates have helped archaeologists and Quaternary scientists debate the timing of cold, ice-free and glaciated phases. They do not provide a political map of prehistoric Ireland, but they reveal a country repeatedly altered by ice advance, water, frost and ecological recolonisation. Crag Cave in County Kerry adds another kind of evidence: its dated stalagmites show that liquid water sometimes circulated through shallow cave systems during milder episodes of the last glacial period. Climatic improvement was episodic, not a simple march towards warmth.

Animals in the Southern Caves

In southern Ireland, Castlepook Cave near Doneraile in County Cork preserves a striking, though complicated, fossil archive. Its collections include remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, lemmings, mountain hare and spotted hyena. This is powerful evidence that, during portions of MIS 3, Ireland could sustain or receive a much richer cold-stage mammal fauna than the modern island. It also places Ireland within a wider ecological zone extending through Britain and continental Europe.

But a cave bone assemblage is not a census of one living community. Carnivores could carry carcass parts into a den; water, collapse and excavation could mix deposits; and animals represented in one cave may have lived centuries or millennia apart. Modern radiocarbon re-dating has shown that several older

Castlepook dates underestimated the antiquity of bones by thousands of years. The strongest conclusion is therefore deliberately limited: cold-adapted and large mammals occurred in Ireland at intervals during MIS 3, while individual bones and species need their own dating and taphonomic assessment.

One Castlepook reindeer femur has generated particular interest because it bears a deep incision interpreted by Ruth Carden as consistent with cutting by a sharp stone tool. County Cork's heritage record places the specimen broadly around 31,000 BC. If the mark is genuinely human-made and contemporary with the bone, it could indicate carcass processing by an Upper Palaeolithic visitor close to the broad period considered here. It would not establish a settled population, a camp, a hunting territory, a named people or a continuous Irish occupation. No securely associated stone-tool assemblage, hearth, dwelling floor or human burial of this age has been found at Castlepook.

People: A Question, Not a Population

This distinction sets the limits of social history for 31,030 BCE. Ireland has no secure evidence of a community living here at that exact time. The Castlepook incision is an important lead, but remains an isolated object in a disturbed cave context. The earliest widely accepted direct evidence for human activity in Ireland is much later: cut marks on a brown-bear kneecap from Alice and Gwendoline Cave in County Clare, dated to approximately 12,810–12,590 calibrated years before present. That later discovery proves that people reached Ireland during the terminal Pleistocene; it cannot retrospectively populate the country twenty millennia earlier.

There can consequently be no responsible account of governments, chiefs, diplomacy, warfare, tribal boundaries or law for this notional year. There are no houses, graves, domestic hearths, weapons, ornaments or tool-making floors that can document them. Nor is there evidence for local farming, herding, mining, long-distance commerce or a traded economy. Reindeer and other animals might have offered meat, hide, sinew, bone and antler to any passing hunters, but assigning hunting strategies or seasonal movements to people in Ireland would go beyond the evidence.

The absence of such evidence is itself historically meaningful. Later glaciation could scour, bury or disperse fragile camps, while caves tend to preserve animal bone more readily than open-air occupation surfaces. Ireland's record is therefore biased towards environmental traces and faunal remains. Archaeologists must distinguish "not yet found" from "did not exist", but neither gap can be filled with confident stories. Human presence is possible in the broad MIS 3 landscape; permanent or recurrent settlement is unproven.

Culture Without Recoverable Ritual

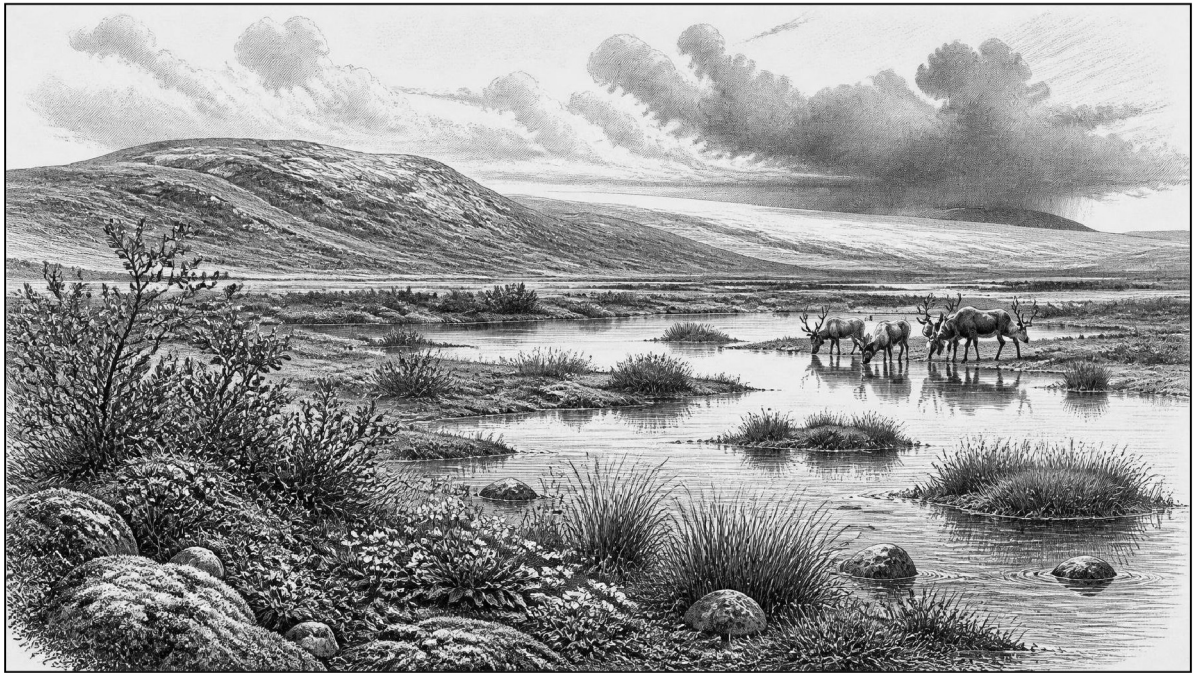
Religion, art, language and learning are equally beyond direct recovery. There is no Irish cave art, carved object, musical instrument, burial rite or symbolic assemblage securely dated to around 31,030 BCE. Continental Europe had Upper Palaeolithic communities capable of elaborate art, ornament and technical knowledge, but proximity does not prove their presence in Ireland. The most that can be said is that, if small groups ever reached this changing northern margin, they would have needed formidable practical knowledge: reading weather and animal movement, managing warmth and food, and travelling through a severe seasonal environment. That is an inference from comparable hunter-gatherer circumstances, not evidence of a specific Irish culture.

The central development around this date was environmental instability. In Fermanagh, freshwater life and tundra vegetation accumulated between two glacial episodes. In Cork, caves preserve evidence for large mammals and predators from parts of the same broad cold-stage world. Across the island, ice-sheet growth, altered sea levels and periglacial conditions repeatedly transformed where animals—and perhaps occasional people—could move. Ireland's history at this depth is not yet a record of societies and events. It is a carefully assembled record of sediments, plants, animal bones and ice, from which the possibility of human contact emerges cautiously rather than conclusively.

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31029 BCE

Castlepook's Reindeer Frontier^[72]



“31,029 BCE” is a modern chronological label, not a year that anyone in Ireland could have named or recorded. At this depth in time, calendar-year precision is unavailable. The label falls about 32,980 years before AD 1950, the conventional radiocarbon reference point, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a climatically unstable part of the last Ice Age. Ireland has no written history, no known ruler, no political community, and no securely dated settlement that can be assigned to this particular year. Its history must instead be reconstructed from buried sediments, fossil plants and insects, cave bones, glacial landforms and radiocarbon measurements with broad uncertainties.

The most responsible picture is therefore regional and provisional. Around this notional date, parts of Ireland may have been open, cold and largely treeless, while other districts were influenced by expanding ice or lay beneath it. The island’s geography, shorelines and connections with neighbouring lands differed greatly from those of today. Yet the surviving evidence is fragmentary, much of it disturbed by later ice, water and excavation. What it can illuminate is an Ice Age environment in which animal populations moved through changing habitats, and in which a possible human trace remains intriguing but unconfirmed as evidence for settlement.

A Date Within a Wide Range

The closest especially informative Irish environmental sequence comes from Derryvree townland near Maguiresbridge, County Fermanagh. Road works in 1969 cut through a drumlin and exposed a layered archive: one deposit of glacial till below, freshwater silts and fine sands with organic material in the

middle, and a second till above. Till is the unsorted sediment left by glacier ice. The sequence demonstrates that ice had crossed the locality, that an interval followed in which freshwater deposits and vegetation accumulated, and that later glacial activity buried them beneath fresh ice-borne debris.

Organic material from the Derryvree deposits produced a radiocarbon determination of 30,500 years before present, with a substantial laboratory uncertainty. A radiocarbon age is not a calendar age: the amount of carbon-14 in the atmosphere has varied through time, and very old measurements must be calibrated against independently constructed chronological curves. Published assessments place the deposit broadly at about 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. Thus 31,029 BCE lies within the broad horizon that Derryvree can help illuminate. It does not date an individual pool, plant, animal or episode at the site, still less the whole island.

This distinction is fundamental. Derryvree was a local wetland archive preserved by exceptional circumstances, not a photograph of Ireland in a single year. Its value lies in showing that an ice-free interval occurred at this Fermanagh location during the later Pleistocene, and that a cold freshwater landscape existed there before renewed glaciation covered the evidence. The precise timing, extent and continuity of ice across Ireland around 33,000 years ago remain subjects of reconstruction rather than direct observation.

Wetlands in a Treeless Country

The Derryvree fossils indicate an open tundra or tundra-steppe environment under periglacial conditions: severe cold, repeated freezing and thawing, and a short growing season. Pollen was poorly preserved, but plant macrofossils and mosses are more revealing. They include sedges, dwarf willow, mountain-avens, Arctic clubmoss, bogbean and aquatic plants such as water-milfoil. These are not evidence for a uniform carpet of vegetation across Ireland. They are evidence that, beside freshwater at Derryvree, cold-adapted plants could survive in marshes, shallow pools and damp ground.

Such a landscape would have been low in trees or without woodland altogether. Open ground, sedge-rich margins and patches of mossy wetland offered very different resources from later post-glacial Ireland. Insects and other small fossils help support the inference of cold conditions, while the enclosing tills show that this living environment was temporary in geological terms. The people who later farmed Fermanagh inherited a country remodelled by ice; the drumlin itself, with its streamlined form and buried organic core, is part of that inheritance.

Environment was the decisive force in this period. The great ice-sheet maximum in Ireland came later, broadly between 27,000 and 23,000 calibrated years before present, though ice margins advanced and retreated unevenly and reconstructions continue to be refined. Around 31,029 BCE, Ireland was moving towards that more severe phase rather than experiencing a stable, island-wide climate. The appropriate image is not of an unchanging frozen wilderness, but of shifting local mosaics: ice, bare mineral ground, shallow water, tundra vegetation and sheltered cave systems.

Castlepook's Animal Record

County Cork provides the other major window on this deep past. Castlepook Cave, near Doneraile, is Ireland's richest known pre-Last Glacial Maximum cave-fauna archive. Excavations from the early twentieth century recovered more than 2,000 surviving bones, although much material had already been

removed or later lost from collections. Re-dating has shown that the cave's animal remains span a long and complex period, with individual specimens ranging broadly from about 45,700 to 19,950 radiocarbon years before present. It was not a single momentary deposit.

The cave preserves evidence of a striking cold-stage fauna: woolly mammoth, reindeer, giant deer, brown bear and spotted hyaena, with wolf, Arctic fox and lemmings represented in later Ice Age contexts. These animals do not mean that every species occupied every Irish valley at once. Cave assemblages accumulate through many processes: carnivores carry in prey and scavenged bones; animals die in or near caves; water moves material; and earlier excavators disturb layers. Nevertheless, the combined record establishes that Ireland, at different points before the glacial maximum, supported or received elements of the wider north-west European cold-climate fauna.

Reindeer are particularly relevant to the notional year. Their presence suggests open habitats and mobile grazing routes rather than dense forest. Mammoth and giant deer underline the ecological scale of the landscape, while spotted hyaena shows that large carnivores also operated in Ireland. A cave is therefore better understood as a repository within an animal landscape than as an ordinary domestic shelter. Castlepook offers powerful evidence for fauna and climate, but limited direct evidence for how humans used the land.

The Mark on a Reindeer Bone

A reindeer femur from Castlepook has been presented by its researcher and in County Cork heritage material as dating to about 33,000 years ago and bearing a deep mark interpreted as a fresh-bone cut or chopping action made with a stone tool. If that interpretation is sustained, it would be the earliest claimed evidence that people handled an animal in Ireland, broadly close to 31,029 BCE. It would be an important indication of a human visit during MIS 3, long before the well-established post-glacial settlement record.

Its limitations must be stated equally plainly. The dated object is the animal bone, not a documented calendar date for the marking event. No securely associated stone-tool assemblage, hearth, habitation floor, burial, food store or settlement has yet been recovered at Castlepook for this period. Recent excavation has confirmed that potentially important Pleistocene deposits survive, but it did not recover cultural artefacts. Nor can one modified bone establish whether a hunter or small party came once, travelled seasonally, crossed from Britain by a route now altered by ice and sea-level change, or belonged to a resident population.

The claim should therefore be treated as evidence under active archaeological investigation, not as licence to invent an Irish hunting camp, tribe or migration. The absence of a demonstrated settlement matters. It means that there is no responsible basis for describing political affairs, diplomacy, warfare, leaders, language, religious practice, artistic traditions, formal learning, trade networks or household organisation in Ireland at this date. Those categories belong to human societies, and the evidence does not yet show such a society here.

Movement, Insularity and Silence

Lower global sea levels during the Ice Age exposed areas of the present continental shelf around Ireland and Britain. But a lower sea is not automatically a walkable, continuous land bridge. Relative sea level depended on global water volumes, local uplift or subsidence under changing ice loads, and the shape of the seabed. Research on Irish palaeogeography warns that possible land connections were

geographically complex and often short-lived. At about 31,029 BCE, moreover, expanding ice could make routes difficult even where shelf land was exposed. Human access remains a question, not an established fact.

If people did reach Ireland, their economy cannot be reconstructed beyond the most cautious possibility of obtaining meat or other materials from a reindeer carcass. It would be unsafe to claim organised reindeer hunting, routine trade in stone, or exchange with communities in Britain or continental Europe without tools, campsites or repeated evidence. The same restraint applies to culture and religion. There are no known Irish images, ornaments, ritual deposits, graves or structures from this horizon. The silence is real, but it is partly a product of preservation: later glaciers eroded landscapes, rising seas drowned former coastlines, and early investigations did not employ modern recovery methods.

An Environmental History, Not an Annal

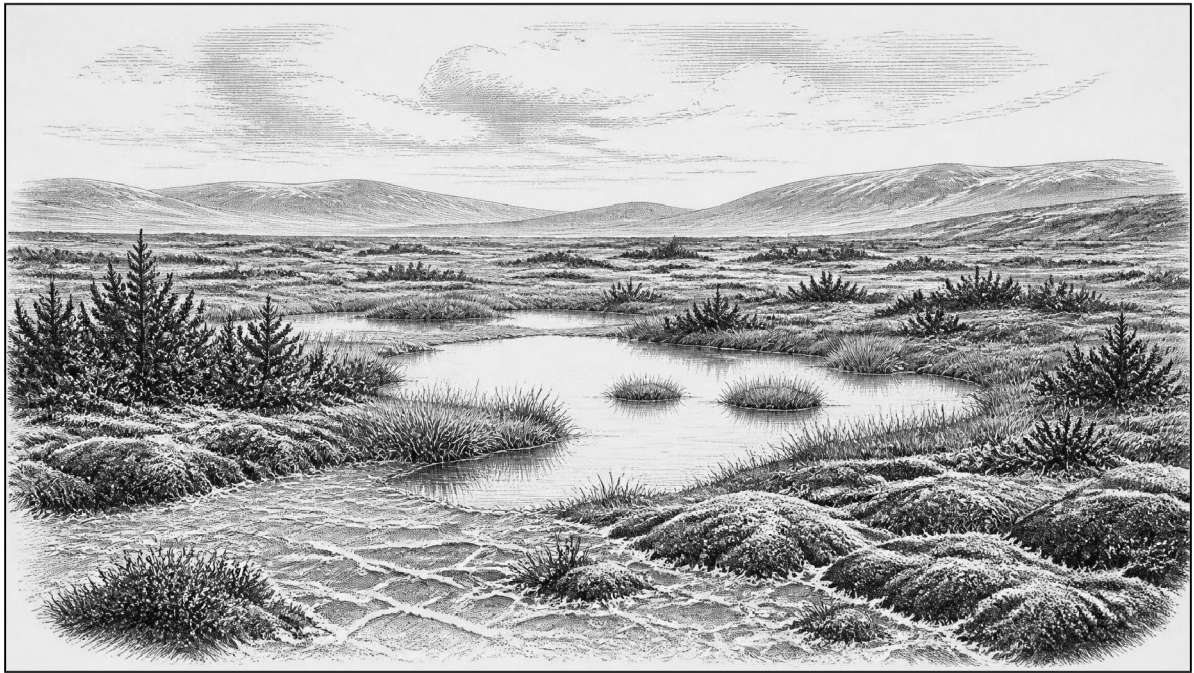
Ireland around 31,029 BCE was not a blank page, but neither was it a historical year in the familiar sense. Derryvree preserves the remains of cold freshwater life between glacial episodes. Castlepook preserves a long, mixed record of large mammals living in, passing through or being carried into an Irish cave landscape. A single marked reindeer bone raises the possibility that humans were present, while falling far short of proving a settled community.

The central development was environmental change: unstable Ice Age conditions were narrowing the ecological opportunities available on the island before the later maximum of the British-Irish Ice Sheet. In that context, the most vivid historically supportable scene is not a named battle or chieftdom, but a cold wetland beside a shallow Fermanagh pool, and reindeer moving across open Cork country under the shadow of caves used by carnivores. The evidence is modest, local and uneven; handled carefully, it is enough to reveal an Ireland already shaped by profound climatic change.

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31028 BCE

Derryvree's Two-Till Freshwater ^[73]



The label 31,028 BCE cannot be treated as a recoverable year in Irish history. No calendar, written record, settlement sequence or securely dated human action lets us identify what occurred in Ireland in that particular twelve-month span. It is a modern chronological convenience, equivalent to roughly 32,978 years before AD 1950, the reference point used in “BP” dating. The responsible subject is therefore a broad Late Pleistocene horizon: an unstable part of Marine Isotope Stage 3, before the Last Glacial Maximum, reconstructed from buried sediments, pollen, plant remains, insects, animal bones and glacial landforms.

The closest unusually informative Irish evidence is the Derryvree freshwater series near Maguiresbridge in County Fermanagh. It does not provide an annual chronicle, but it does illuminate the sort of landscape that existed in at least part of Ireland during a cold, ice-free interval overlapping the broad timescale in which 31,028 BCE falls. Farther south, the mixed animal-bone collection from Castlepook Cave near Doneraile, County Cork, demonstrates that large mammals and carnivores reached Ireland during episodes of the same general pre-maximum world. Together, these records reveal a country that was neither permanently entombed by ice nor comfortably temperate: a harsh, open and changing Atlantic-edge landscape.

Dating a Landscape, Not a Day

Derryvree was exposed in a road cutting in 1969, when investigators found freshwater silts, fine sand and organic material enclosed between two thick layers of till, the unsorted debris deposited by glacier ice. The stratigraphy is the essential evidence. A glacier had crossed the area and laid down the lower till;

later, water and vegetation accumulated in a non-glacial interval; finally, renewed ice advance buried the deposit beneath the upper till. This is an exceptionally valuable sequence because later ice sheets destroyed or disturbed much older evidence across Ireland.

Organic material from the series produced the conventional radiocarbon determination BIRM-166 of $30,500 \pm 1,100$ radiocarbon years BP. Radiocarbon years are not identical to calendar years. Atmospheric carbon-14 has varied through time, and measurements must be calibrated against internationally maintained curves. Published discussions have placed the Derryvree age broadly at about 36,900–31,700 calibrated years BP; calibration methods and resulting boundaries can be refined, but the important point remains the breadth of the range. The modern date 31,028 BCE falls within this kind of chronological resolution. It cannot be assigned to the formation of a particular pool, plant, animal death or human visit.

That distinction matters. A named BCE year encourages false precision, while the actual evidence records episodes, deposits and ecological conditions accumulated over far longer periods. It can show that north-central Ireland was locally ice-free late in MIS 3. It cannot prove that all of Ireland was ice-free at once, nor that every region experienced the same weather, vegetation or animal population. The Derryvree deposit is a local archive with national importance, not a photograph of the whole island.

Wet Ground Between Ice Advances

The Derryvree fossils point to a treeless, cold-stage wetland often described as muskeg: waterlogged ground with mosses, sedges, low herbs, dwarf shrubs and open pools. Plant evidence includes grasses and sedges, juniper and other herbs, together with mosses; aquatic and wet-ground plants indicate standing or slow-moving freshwater. Insects reinforce the interpretation of damp, organic-rich ground rather than a dry, featureless plain. This was not a forested Ireland of oak woods and enclosed fields, but a patchwork of wet hollows, shallow water, saturated vegetation and exposed mineral ground.

Such a setting could still be biologically productive in the brief growing season. Pools and margins offered plant matter, invertebrates and shelter at a small scale; sedge-rich ground could support grazing animals where snow cover, wind and season allowed. Yet productivity should not be mistaken for abundance in the modern sense. The evidence suggests severe winters, short summers and a landscape vulnerable to frost, flooding and abrupt shifts in temperature. There is no basis for imagining permanent villages beside Derryvree. The surviving record is environmental, not domestic.

The deposits also illuminate regional change. The lower and upper tills show that the wetland belonged between glacial advances, while broader reconstructions indicate that the principal expansion of the last Irish sector of the British–Irish Ice Sheet occurred after roughly 34,000 years ago and reached much farther south only later. Thus 31,028 BCE belongs to a long period of ice-sheet build-up rather than to the Last Glacial Maximum itself, conventionally placed around 27,000–23,000 BP. In this earlier interval, ice margins, meltwater systems and habitable terrain could all change substantially over comparatively short geological timescales.

Animals on an Atlantic Margin

Castlepook Cave supplies a different kind of evidence. Its old excavations produced a notable Late Pleistocene faunal collection, including remains attributed to woolly mammoth, reindeer, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. Recent redating has been especially important: improved pretreatment of bone samples showed that some earlier radiocarbon

results from southern Irish caves had made animals appear younger than they were. The outcome is a stronger case for a varied MIS 3 fauna in Ireland, with some species apparently gone locally before the Last Glacial Maximum.

But Castlepook must not be read as a single living scene. Cave deposits may combine remains accumulated during different visits and periods; carnivores can drag in prey and scatter bones; water, slopewash and earlier excavation can disturb original relationships. Spotted hyaena is particularly significant because it warns against treating a cave-bone assemblage as human refuse. The assemblage demonstrates intermittent animal movement through and into Ireland, but does not establish that every species coexisted at Castlepook, or anywhere else, in 31,028 BCE.

Even so, the fauna has major implications. Reindeer, lemmings and Arctic fox fit cold, open habitats, while mammoth and giant deer indicate that routes existed through which large grazing mammals could reach the island during favourable phases. Ireland was not then isolated in the modern geographical sense. Lower sea levels altered coastlines and narrowed crossings, although the precise availability of land, ice or water routes varied through time. Migration was possible; it was not necessarily easy, continuous or equally feasible for all species.

The Unsettled Human Question

A reindeer femur from the historic Castlepook collection has been publicly presented as roughly 33,000 years old and as bearing a deep mark made while the bone was fresh, possibly by a sharp stone tool during carcass processing. If that interpretation is confirmed, it would be exceptionally early evidence for human handling of an animal in Ireland. It would suggest a brief episode of mobile hunter-gatherer activity within the wider north-west European Upper Palaeolithic world, rather than the beginning of a documented Irish population.

The limits are as important as the possibility. The bone is not from a modern excavation of a sealed occupation floor accompanied by a stone-tool assemblage, hearth, shelter, food-processing area, burial or repeated habitation layers. A radiocarbon date can date the animal, not automatically the maker of a surface mark. Nor can one modified specimen establish a settlement, seasonal territory, language, kin group or cultural tradition. The securely dated evidence for later terminal-Pleistocene human activity at Alice and Gwendoline Cave in County Clare is far younger, around 12,810–12,590 calibrated BP; it demonstrates how rare direct evidence remains even much closer to the end of the Ice Age.

Accordingly, political affairs, diplomacy and organised warfare are beyond the evidence for this date. There are no known chiefs, polities, boundaries, treaties or battle sites. Nor is there support for farming, herding, pottery, monuments, metalworking or trade in the later prehistoric sense. If people did enter Ireland during this period, their movements would most plausibly have been small-scale and environmentally constrained, but that is an inference from wider Upper Palaeolithic patterns, not a fact demonstrated by an Irish camp.

Culture Without a Chronicle

Religion, art, learning and everyday social customs likewise leave no identifiable Irish record around this point. The absence is not evidence that such capacities were absent among people elsewhere in Europe; it reflects the absence of securely associated Irish human material. The cultural history that can responsibly be written is instead one of scientific learning: palaeobotany reconstructs vegetation from

minute remains, entomology identifies ecological conditions from insects, zooarchaeology evaluates bone accumulations and radiocarbon science tests their chronology. Each method contributes part of the picture; none supplies a lost narrative whole.

Ireland around 31,028 BCE was therefore a place of cold wetlands, open ground, shifting ice margins and episodic animal movement. Derryvree's freshwater sediments show that life persisted locally between glacial advances. Castlepook's bones show that a substantial Ice Age fauna reached the island during the wider period. A single marked reindeer bone raises an important question about human presence, but cannot settle it. The historical value of this date lies not in an invented event, but in recognising how much of Ireland's deepest past survives in a narrow band of silt between two tills.

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31027 BCE

The Fermanagh Bogbean Record^[74]



The label 31,027 BCE suggests a precision that the Irish evidence cannot bear. No one in Ireland recorded a year, season, ruler or event at this depth of time, and neither archaeology nor environmental science can isolate a particular calendar year. In radiocarbon terms, the date lies roughly 33,000 calendar years before the conventional present of AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a long, cold and unstable phase of the last glacial cycle. The responsible history of Ireland at this point is therefore a history of dated ranges, buried sediments, animal bones and changing ice, rather than an annual chronicle.

The most revealing Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. There, road-cutting in 1969 exposed a rare freshwater series sealed inside a drumlin. Organic silts and fine sands lay between two thick deposits of glacial till: material left by glacier ice. The order matters. Ice had previously crossed the locality and deposited the lower till; later, a non-glacial freshwater environment formed; still later, ice or glacial sediment again covered and preserved it. Derryvree does not describe all Ireland in one moment, but it offers an unusually valuable local window onto a cold interval broadly relevant to this date.

A Date Within a Broad Range

Organic material from the Derryvree deposits produced a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 years BP. That is a laboratory radiocarbon age, not a calendar date. At such antiquity, calibration against changing atmospheric carbon levels produces a wide probability range spanning several millennia. Consequently, 31,027 BCE can be related cautiously to the deposit's general

chronological horizon, but cannot be assigned to a particular layer, plant, insect, animal or episode at Derryvree. The evidence supports an environmental setting around this broad period; it does not support a claim that a named occurrence happened in Ireland in this individual year.

This distinction is more than technical. Much of Ireland's Pleistocene record was eroded, reworked or buried during later glaciations. What survives is uneven in both geography and age. A freshwater bed below a Fermanagh drumlin, and faunal material recovered from caves in the south, are precious precisely because they have escaped complete destruction. They must not, however, be turned into a map of every valley, coast or upland. Ireland was not a uniform landscape. Local conditions depended on altitude, exposure, drainage, proximity to ice and the shifting position of the ice-sheet margin.

Freshwater at Derryvree

The Derryvree silts preserve the signatures of standing or slowly moving freshwater and wet ground. Pollen, plant macrofossils, mosses and insect remains indicate an open, cold landscape rather than woodland. The flora included hardy wetland and tundra-associated plants. A seed of bogbean (*Menyanthes trifoliata*) is especially striking: the plant is familiar in modern marshy ground, yet its fossil presence here records a far colder world. Fossil dwarf willow and mountain-avens, together with sedges, mosses and other herbs, point to sparse vegetation around pools, wet hollows and exposed mineral soils.

"Tundra" should not conjure a featureless white waste. The best interpretation is a periglacial mosaic: shallow water, saturated margins, low herbaceous cover, patches of moss and sedge, and more exposed, frost-affected ground. Summer growth could have been rapid where meltwater and light allowed it, while winters were severe and long. Trees were absent locally or extremely scarce. A few pollen grains from trees cannot overturn that conclusion, since pollen may travel great distances or be redeposited. The stronger evidence is the combined ecological character of the assemblage: an open, treeless and cold freshwater landscape.

Such conditions shaped every possibility for life. There was no farming, no managed pasture and no permanent field system. There is no evidence for houses, campsites, hearths, pottery, textiles, boats or built monuments from Derryvree's horizon. Nor is there material evidence for religious practice, formal learning, political authority, diplomacy or exchange networks in Ireland at this date. These are not missing chapters waiting to be filled with analogy; they are questions for which the surviving Irish record presently gives no answer.

Animals in a Changing Country

Southern Irish caves nevertheless show that parts of the island supported a more varied cold-stage fauna during MIS 3 than the modern landscape would suggest. Castlepook Cave near Doneraile, County Cork, is central to that evidence. Its historic excavations produced remains attributed to reindeer, woolly mammoth, giant deer, brown bear, hare, fox and spotted hyaena, among others. The cave collections are scientifically important but difficult: much of the material was excavated in the early twentieth century, before modern standards of stratigraphic recording, and bones from different periods can be mixed by animal activity, water movement, sediment disturbance and excavation.

Modern radiocarbon re-dating has revised the chronology of several southern Irish cave specimens, demonstrating that some are thousands of radiocarbon years older than earlier measurements indicated. The broad conclusion is secure: mammals entered and lived in Ireland during parts of MIS 3, before the Last Glacial Maximum. The more detailed claim—that every species listed from Castlepook occupied the

same landscape at the same time—would be unwarranted. Cave assemblages accumulate over long intervals. They record animal presence and ecological opportunity, not a single living community frozen in time.

Reindeer are particularly relevant to the environmental picture. Their presence is compatible with open country and cold climates, though bones alone cannot tell us whether herds were resident, seasonal or occasional visitors. Mammoth, giant deer and hyaena remains demonstrate that Ireland's Late Pleistocene fauna included animals now absent from the island, but their discovery does not make the country a simple replica of a continental "mammoth-steppe". The island setting, variable topography and advancing ice ensured local complexity. Predators, scavengers and herbivores would have followed food, shelter and passable terrain, while seasonal snow cover and frozen ground constrained movement.

The Castlepook Human Question

One Castlepook reindeer femur has acquired exceptional importance because a deep surface mark has been interpreted as a fresh-bone cut or chop made by a sharp stone tool. County Cork heritage material has presented the bone as dating to about 31,000 BCE, and its potential implications are considerable. If the modification is confirmed as human-made and securely connected to the bone's age, it may indicate that a person or small group processed a reindeer in Ireland during the Upper Palaeolithic, far earlier than the island's well-established post-glacial settlement record.

Yet the inference must remain limited. A modified bone is not a settlement; it does not establish a resident population, a camp, a language, a kin group or a cultural tradition. No associated lithic assemblage, hearth, dwelling, burial or securely stratified occupation surface of this date has been recovered in Ireland. The National Museum of Ireland accordingly continues to stress that clear Palaeolithic human presence has not been demonstrated. Ongoing work at Castlepook seeks surviving deposits, improved dating and further cultural evidence. For 31,027 BCE, the responsible conclusion is that human activity is a serious possibility under investigation, not an established social history.

Ice, Coasts and Isolation

This was also a world moving towards more extensive glaciation. The Last Glacial Maximum lay later, broadly between about 26,000 and 20,000 years ago, but British-Irish Ice Sheet reconstructions show that ice growth was already an important process during the preceding millennia. It would be misleading to imagine the whole island already sealed beneath ice at the date considered here; Derryvree itself demonstrates a local interval without ice at that site. Equally misleading would be an image of a wholly benign, open Ireland. Ice margins advanced and retreated over long timescales, reshaping drainage, removing sediments and narrowing habitable ecological zones.

Lower global sea levels altered the surrounding seas and exposed parts of today's continental shelf, but no evidence allows a confident reconstruction of a usable route into Ireland in this particular year. A late-Quaternary land bridge between Britain and Ireland is not established for the relevant deep-time setting, and any animal or possible human arrival cannot simply be explained by drawing a continuous road across the Irish Sea. The sea, tidal channels, ice and changing coastlines remained major constraints. There is no evidence for trade or diplomacy; at most, the broader north-west European setting suggests that any people who reached Ireland would have belonged to highly mobile hunter-gatherer worlds already adapted to cold landscapes.

What Can Be Said Responsibly

Ireland around 31,027 BCE was not yet the familiar island of forests, farms, monuments and recorded peoples. The evidence instead reveals an intermittently habitable Late Pleistocene landscape, shaped above all by climate. At Derryvree, freshwater and tundra plants endured between phases of glacial occupation. In southern caves, animal bones show that large mammals and carnivores entered Ireland during the wider MIS 3 interval. At Castlepook, one marked reindeer bone raises the possibility of an early human encounter with that landscape, but does not yet prove permanent occupation.

That is a modest account, but not an empty one. Bogbean seed, moss fragments, insect remains, cave bones and layers of till show how life persisted at the edge of ice. They also explain why the archive is so thin: later glaciers repeatedly transformed the ground on which any camps or trackways might once have lain. For this notional year, Ireland's history is best understood not as a story of rulers or battles, but as an archaeological threshold—cold water beneath a drumlin, open tundra beyond it, and a still-unresolved question of whether people briefly entered the scene.

Chapter 075 of 100

31026 BCE

Castlepook's Lone Reindeer Mark ^[75]



“31,026 BCE” is not a date at which Irish history can be narrated year by year. It is a modern calendar label projected almost 33 millennia into the past, during the Upper Palaeolithic and Marine Isotope Stage 3. No written records, named communities, rulers, settlements or securely dated events survive from Ireland for this notional year. Even radiocarbon results do not provide such precision: they are measurements with uncertainties, expressed conventionally in years before 1950 and then calibrated into broad calendar ranges. The responsible question is therefore not what happened in Ireland in this single year, but what the archaeological and environmental record can say about conditions in the island during the wider period around it.

A Cold Island Before Maximum Ice

This was an interval before the Last Glacial Maximum, when the British–Irish Ice Sheet later reached its greatest extent, broadly between about 27,000 and 23,000 calibrated years before present. Ireland was not yet the entirely ice-covered landscape of that maximum, but neither was it stable or uniformly hospitable. Ice margins advanced and retreated at different times in different regions; climate shifted rapidly; and surviving deposits are patchy. A location that was open ground or wetland during one phase could later be overridden by ice, its surface evidence destroyed or deeply buried beneath till.

Sea level was substantially lower than today because large volumes of water were locked in northern ice sheets. The outlines of coastlines, estuaries and shallow seas differed markedly from modern maps. Yet lower sea level should not be mistaken for proof of an easy land crossing or continuous dry route to Ireland. The configuration of the Irish Sea basin, ice, rivers and coastlines changed repeatedly. For people or animals approaching from Britain or continental Europe, any route westward was shaped by cold, terrain, water and the availability of food, not simply by a single line on a map.

In archaeological terminology, this belongs to the Upper Palaeolithic: the long period in which *Homo sapiens* populations elsewhere in Europe used sophisticated stone technologies and lived by hunting, gathering and seasonal movement. That continental framework is useful, but it must not be converted into an imagined Irish society. No securely excavated Irish camp, hearth, stone-tool assemblage, dwelling, burial, artwork or ornament can presently be assigned to around 31,026 BCE. There is consequently no evidential basis for describing clans, leaders, languages, religious practices, diplomacy, trade networks or a settled political order in Ireland at this time.

The Castlepook Question

The most arresting evidence relevant to this broad horizon comes from Castlepook Cave, near Doneraile in north County Cork. Excavations there in the early twentieth century recovered a remarkable concentration of Pleistocene animal remains. The cave's collections include evidence for reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These animals do not all represent one moment or one intact living community. Cave deposits accumulated through natural deaths, carnivore activity, water movement, sediment disturbance and early excavation, over a very long span. Castlepook is therefore an archive of changing Ice Age environments rather than a snapshot of one hunting episode.

A reindeer femur from the cave has been publicly presented as bearing a deep linear mark interpreted as a fresh-bone cut or chop made by a sharp stone implement, and as having an age of roughly 33,000 radiocarbon years. If that interpretation and association are sustained, it would indicate a human visit or butchery event in Ireland far earlier than the previously accepted terminal-Pleistocene evidence. It would not demonstrate a permanent population, a village or repeated occupation. One marked animal bone, especially from an old collection without associated tools, hearths or a modern excavation context, can at most support the possibility of a brief human action.

The distinction matters because cut marks can be difficult to diagnose, and the age of a bone does not itself date the instant when a surface mark was made. The reported reindeer evidence is important enough to deserve continued specialist scrutiny, but it should not be inflated into a foundation story for the Irish people. The more securely published evidence for Palaeolithic human activity remains much later: a cut-marked brown-bear patella from Alice and Gwendoline Cave, County Clare, radiocarbon dated to the opening of the Younger Dryas, about 12,810–12,590 calibrated years before present. That later find shows why direct dating and close zooarchaeological examination can transform old museum collections; it also illustrates how rare Ireland's evidence is.

Animals, Not an Irish Nation

Castlepook nonetheless gives an unusually vivid indication of the ecological possibilities of pre-maximum-glaciation Ireland. Reindeer imply open, cold-adapted habitats with extensive grazing and browsing opportunities. Mammoth and giant deer point towards broad, largely treeless landscapes rather than closed woodland. Spotted hyaena, represented at Castlepook by bones and other evidence of carnivore use of the cave, was not a tropical animal transplanted into a northern fantasy: Ice Age spotted hyaenas ranged across temperate and cold-steppe environments in Europe. Wolves, foxes and small mammals complete a food web in which carcasses, predators and scavengers all contributed to the fossil record.

This was not the modern Irish fauna in harsher weather. It was a different ecological world, shaped by cold climates, open vegetation and mobility. Some species were local only intermittently; others may have disappeared from Ireland before the later glacial maximum. Re-dating work has shown that several older Irish cave radiocarbon determinations were too young because early methods did not remove contaminants as effectively as modern ultrafiltration techniques. At Castlepook, revised dates have pushed some fauna thousands of radiocarbon years further back. The lesson is methodological as well as historical: apparent certainty about a single Ice Age date can be overturned by better sampling and laboratory practice.

Derryvree's Buried Wetland

Another essential line of evidence lies far from Cork. At Derryvree near Maguiresbridge in County Fermanagh, roadworks exposed freshwater silts and fine sands enclosed between two thick layers of glacial till inside a drumlin. The sequence records a local order of events: ice deposited the lower till; an interval without ice at that spot allowed freshwater sediment and organic remains to accumulate; then later ice or a renewed advance sealed the deposit beneath upper till. It is not a record of one year, nor proof that all Ireland was ice-free simultaneously, but it is a rare survival from a landscape otherwise repeatedly remodelled by glaciers.

The Derryvree material produced a conventional radiocarbon determination of about 30,500 years before present, with a substantial uncertainty. Modern calibration places the relevant interval broadly in later Marine Isotope Stage 3, approximately 37,000–32,000 calibrated years before present. That wide range overlaps the notional calendar position of 31,026 BCE only in the loosest chronological sense. Its value lies in environmental evidence: pollen, plant macrofossils, mosses and insects indicate open, treeless ground, with grasses, sedges, herbs, juniper and cold-tolerant plants around freshwater pools and wet, peaty ground. Scholars describe such a setting as tundra or muskeg, not as a forested Ireland.

These environmental archives help explain both the attractions and limits of the island. Seasonal wetlands could support plants, birds and grazing animals, while limestone caves offered shelter to animals and perhaps occasional people. But cold temperatures, shifting ice fronts, exposed terrain and thin vegetation would have made long-term living difficult. The evidence supports a landscape capable of sustaining animal populations and perhaps transient human parties; it does not establish a stable human homeland. Any people reaching Ireland may have been highly mobile hunter-gatherers, able to exploit animal movements and short seasonal opportunities. That is an inference from the wider European Upper Palaeolithic and the local fauna, not a directly documented Irish way of life.

What Cannot Be Claimed

There is no basis around this date for political history in the usual sense. No state, chieftdom, territory, treaty, battle or diplomatic relationship can be identified. Nor is there evidence for farming, herding, pottery, metallurgy, monument building, formal trade or permanent settlement. Reindeer were wild, not domestic stock; a possible butchered bone would represent food processing or the use of animal materials, not an agricultural economy. Likewise, no shrine, grave, cave art or symbolic object from Ireland can responsibly be assigned to this horizon, so claims about belief, ceremony, language or learning would be invention.

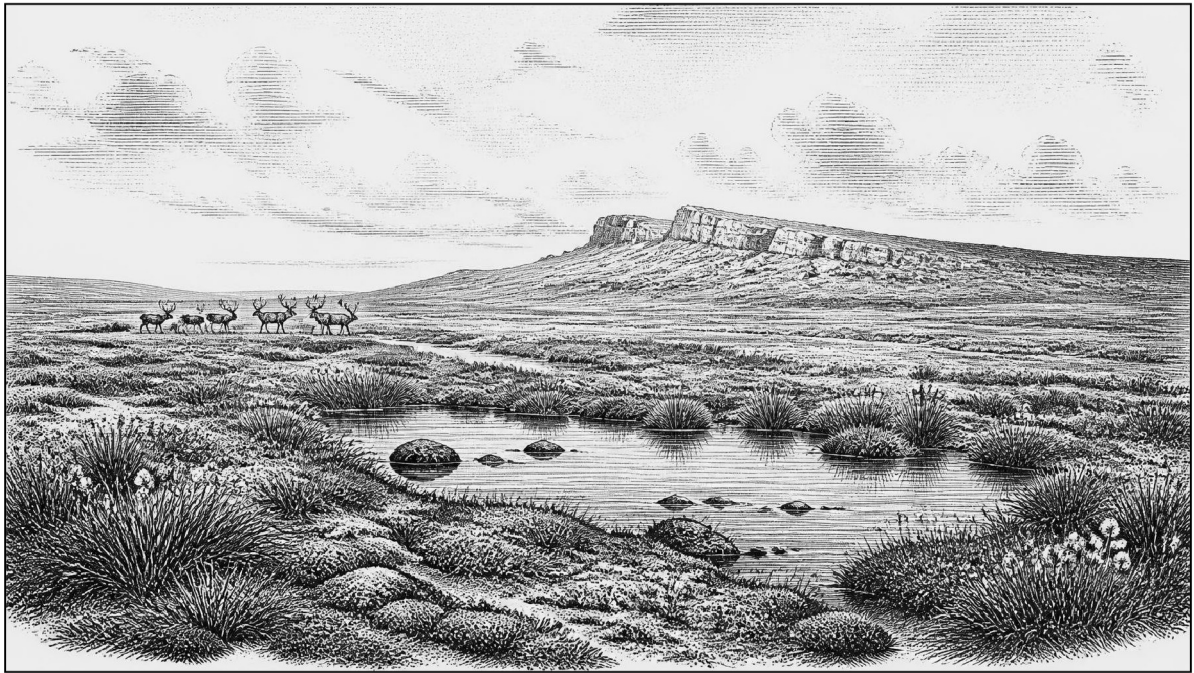
The most meaningful regional development was environmental instability. Ireland stood on the Atlantic edge of north-west Europe while the climate deteriorated towards full glacial conditions. Ice, permafrost, wind, runoff and sparse plant cover affected which animals could enter or persist and which traces could survive. Later ice erosion almost certainly removed many surface sites. This destructive history is one reason why absence of discovered camps is not proof that no person ever set foot on the island. Equally, erosion cannot serve as permission to assert an undocumented population. The record permits carefully framed possibility, not certainty.

For Ireland around 31,026 BCE, then, Castlepook and Derryvree offer complementary evidence. The Cork cave preserves a faunal archive from an open, cold-stage ecosystem and a provocative possible sign of butchery. The Fermanagh sediments preserve a buried freshwater landscape between phases of glaciation. Together they reveal an island undergoing profound climatic change, inhabited by an Ice Age animal world and potentially visited by small human groups. They do not reveal an Irish society in the later historical sense. Their significance is precisely that they preserve the fragile, contested beginnings of a much deeper human and environmental past.

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31025 BCE

Cork Femur Beyond Fermanagh Drumlins^[76]



A Year That Cannot Be Dated

31,025 BCE is a useful modern label, not a date at which Ireland can be described year by year. No calendar, written account, named community or securely dated occupation surface allows events to be fixed to this particular year. The responsible frame is the later part of Marine Isotope Stage 3, an unstable phase of the last Ice Age, before the Last Glacial Maximum. For this deep period, radiocarbon measurements must be calibrated into broad probability ranges, and those ranges can span centuries or millennia. The evidence therefore illuminates an interval around the date, rather than an anniversary within it.

The closest Irish records are very different in kind. In County Cork, Castlepook Cave near Doneraile has yielded an extraordinary collection of Ice Age animal remains, including reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. In County Fermanagh, the Derryvree road section near Maguiresbridge exposed freshwater silts and sands trapped between two deposits of glacial till. One site preserves bones accumulated in a cave over long and probably discontinuous episodes; the other preserves a wetland sedimentary sequence later overridden by ice. Together they make the Ireland of this period visible, but neither is a diary.

Cold Country, Not a Frozen Island

Around this broad horizon, parts of Ireland were capable of supporting plants, animals and flowing or standing freshwater. That conclusion matters because the ice sheet that later covered much of the island was not yet at its maximum. The greatest expansion of the last British–Irish Ice Sheet belongs chiefly to a

later interval, roughly 27,000–23,000 calibrated years before present, although modern reconstructions stress that ice growth differed markedly between regions and could proceed quickly. It would be wrong, however, to turn this into a simple map for 31,025 BCE. Local ice margins, snow cover and seasonality are not known at a yearly resolution.

Derryvree provides the most vivid environmental evidence. Its organic freshwater deposits gave a conventional radiocarbon result of 30,500 years BP, with a large laboratory uncertainty. When calibration is considered, the deposit is more responsibly placed within a broad span of approximately 36,900–31,700 calibrated years BP, or about 34,950–29,750 BCE. The nominal year in this article falls within that range, but is not itself dated by the deposit. The sediment lay between tills, demonstrating that a cold-stage freshwater landscape existed there before a subsequent advance of ice transformed the ground.

Pollen, plant macrofossils and other biological remains indicate open, treeless country: a periglacial mosaic rather than modern Ireland's damp, wooded pastoral landscape. Mosses, sedges and grasses grew around wet ground; bogbean and water-milfoil point to freshwater habitats; mountain-avens and lesser clubmoss are consistent with cold, exposed conditions. Scholars have described the setting as muskeg, meaning waterlogged, peaty ground with shallow pools and low vegetation. That does not mean an unchanging blanket bog. Freezing, thaw, water level, sediment supply and plant cover altered through time. It does show that even in a severe climate, Ireland held ecologically varied refuges of wetland life.

Castlepook's Mixed Animal Archive

At Castlepook, cave deposits supply a complementary record of animals moving through, dying in, or being dragged into limestone passages. The range of species is striking. Reindeer and lemmings evoke cold open environments; Arctic fox and mountain hare reinforce that picture. Woolly mammoth and giant deer demonstrate the former presence of large herbivores, while wolf and spotted hyaena reveal a substantial carnivore guild. A spotted-hyaena skull in the National Museum of Ireland's collections is a material reminder that the Irish fauna of the late Pleistocene was unlike that of any later historical period.

Yet the fauna must not be made into a single painted scene. Cave assemblages can mix remains deposited years, centuries or much longer apart. Carnivores carry bones, scavengers modify them, water moves sediment, roof falls disturb layers, and the earliest Castlepook excavations of 1904–13 predated modern approaches to excavation, sampling and stratigraphic recording. Improved pretreatment and ultrafiltration of bone collagen have also shown that several earlier Irish cave dates were too young. The revised programme placed some Castlepook animals much further back in Marine Isotope Stage 3 and suggested that giant deer and spotted hyaena had disappeared locally before the Last Glacial Maximum. The cave proves repeated animal presence across a long cold-stage history, not one perfectly synchronous community.

For the date under consideration, a reindeer femur from Castlepook has particular importance. County Cork's heritage catalogue assigns it broadly to c. 31,000 BCE and reports a deep incision interpreted by zooarchaeologist Ruth Carden as having been made by a sharp stone tool during carcass processing. If that interpretation is upheld, it would be a remarkable indication that people reached Ireland during the Upper Palaeolithic, far earlier than the better-attested late-glacial human evidence from County Clare. It could represent a brief encounter with a carcass: butchery, tendon removal or another act of processing. It is not evidence for a permanent settlement.

The Human Question

That distinction is essential. Castlepook has yielded no securely associated hearth, dwelling, burial, stone-tool assemblage, food-preparation surface or stratified hunting camp of this age. The femur is from an old collection rather than a modern excavation of an intact occupation horizon. A radiocarbon date determines the age of the animal's surviving collagen within a probability range; it does not independently date an incision, identify its maker, establish where the animal died, or demonstrate how many people were present. Specialist study is required to distinguish cuts made by stone tools from marks caused by teeth, trampling, breakage, weathering or excavation damage.

The appropriate conclusion is therefore deliberately modest. A humanly made mark remains a plausible and potentially major interpretation, but the evidence does not permit an invented Irish hunting band, a named migration, a camp at Castlepook or a story of continuous population. If people did visit, they may have been a small and mobile Upper Palaeolithic party exploiting a reindeer carcass during a short incursion. Their knowledge of animal movement, weather, shelter and raw materials would have been sophisticated, but neither their language nor their social organisation is recoverable from one bone.

Nor can the route be specified. Lower global sea levels altered the outlines of the surrounding shelf, but Ireland's relationship to Britain and continental Europe was governed by changing sea level, land uplift, ice and marine waters. Later research has rejected a simple post-glacial dry-land bridge as an explanation for Ireland's colonisation. For this earlier interval, neither a direct terrestrial crossing nor a particular water crossing has been demonstrated. Animal arrivals show that biological connections occurred intermittently; they do not identify the path or prove that people used the same route.

No Politics, but a Material World

There is no evidence for political affairs, diplomacy, formal warfare, rulers, territories or institutions in Ireland at this time. There is also no Irish evidence from around 31,025 BCE for religious monuments, formal graves, images, musical instruments or a sustained local tradition of art and learning. Upper Palaeolithic societies elsewhere in Europe made sophisticated lithic and organic tools, ornaments and spectacular cave art, but these wider achievements cannot simply be transferred across the sea to Ireland. They provide context for what visiting people might have known, not proof of what they did here.

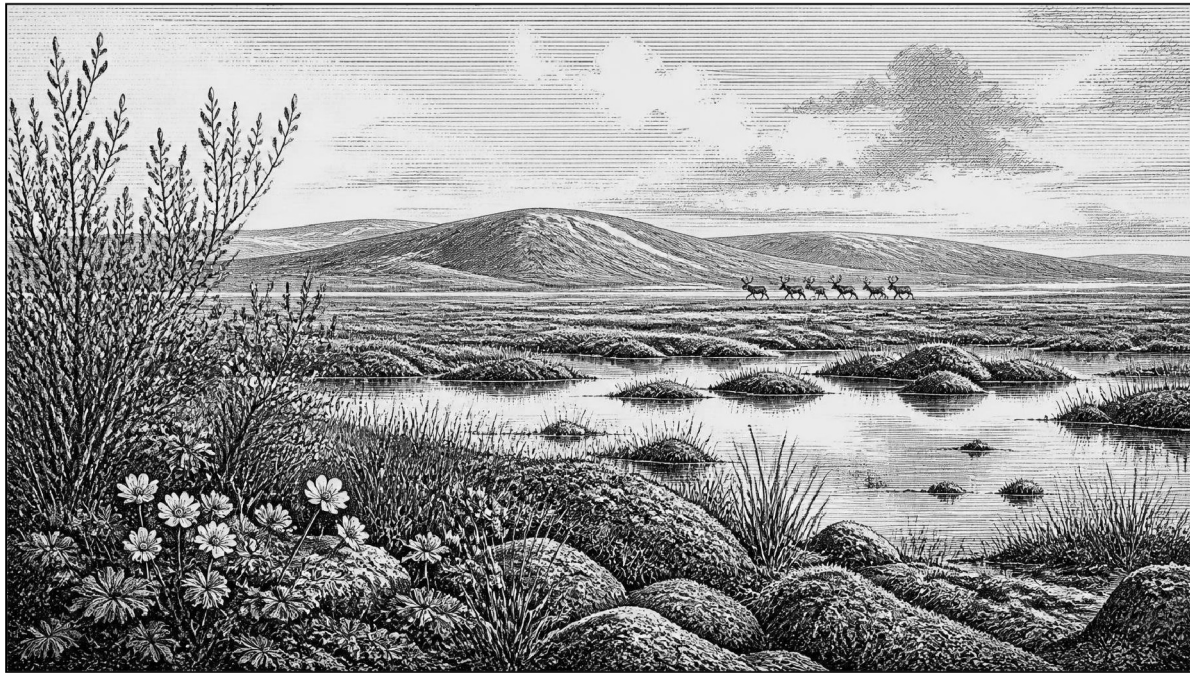
Economy, too, can be described only through ecological opportunity rather than a documented community. Reindeer could have offered meat, fat, hide, sinew, antler and bone; mammoth and giant deer would have been conspicuous resources and dangers within wider landscapes. But Castlepook does not establish hunting of every species, seasonal schedules, exchange networks or food-sharing rules. Hyaenas and wolves were competitors and scavengers, not evidence of human conflict. The cave itself may have been used more often by carnivores than by people.

The dominant historical development was environmental change. Across Ireland, the availability of grassland, wetland, shelter and migratory prey was conditioned by pronounced cold, seasonality and the fluctuating growth of ice. At Derryvree, freshwater life survived in an open tundra-like landscape; at Castlepook, diverse animals left traces in a limestone cave system; later glaciation buried, eroded and rearranged much of what might once have survived. That destructive legacy helps explain why the evidence is so sparse. Ireland around 31,025 BCE is not a realm of kings or settlements. It is a scientifically recoverable landscape of silt, bone, wet ground and approaching ice, with one marked reindeer femur posing an important but still carefully bounded question about the earliest human presence.

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31024 BCE

Derryvree's Muskeg Corridor^[77]



A Date Without a Dateline

31,024 BCE is a modern label placed upon a span of deep time, not a year from which Ireland can yield an event-by-event chronicle. There are no written records, named people, settlements, rulers or calendar systems for the island at this depth. Modern calendar-year precision is unavailable. In the archaeological convention of years before AD 1950, this point lies about 32,973 years before present, within Marine Isotope Stage 3 (MIS 3), a climatically unsettled part of the Late Pleistocene. Evidence is dated as ranges, and the ranges themselves are revised as laboratories, methods and radiocarbon calibration curves improve.

That caution is especially important in Ireland. Later glacier ice repeatedly eroded, transported and buried earlier surfaces. Much of the material that might once have documented camps, tracks, hearths or working areas was scoured away or now lies under offshore sediments. The surviving record is therefore uneven: a buried wetland deposit in County Fermanagh, disturbed cave assemblages in the south, and landforms that preserve the movement of ice more clearly than the actions of people. These sources can describe an Irish environment around this broad horizon; they cannot supply a particular day in 31,024 BCE.

An Island in an Unstable Ice Age

Ireland was in the last Ice Age, but it should not be pictured as a permanently uniform white wilderness. MIS 3 contained abrupt shifts between relatively milder intervals and severe cold phases across the North Atlantic region. The major expansion associated with the Last Glacial Maximum lay

ahead, although ice already had a long and complex history on the island. Geological reconstructions show that the growth and movement of the British–Irish Ice Sheet varied by region. At this date, some ground could be ice-free while other areas bore ice or were shaped by intense periglacial conditions: hard frost, seasonal thaw, sparse vegetation, unstable soils and braided meltwater channels.

Sea level was far lower than it is today because vast quantities of water were held in global ice sheets. Coastlines, estuaries and shallow seas consequently differed greatly from modern ones. Yet low sea level does not justify an easy statement that Ireland was simply joined to Britain by a permanent, broad land bridge. The detailed form, duration and accessibility of possible routes changed with sea level, local topography, ice margins and watercourses. For animals, and perhaps for occasional people, the island was part of a wider north-west European ecological zone; precisely how each arrival occurred remains a separate question.

The strongest regional point is not that all Ireland shared one landscape, but that conditions changed over short geological timescales and differed from place to place. Upland exposure, distance from ice, drainage and local shelter mattered. A landscape that carried animals in one interval could later be overridden by ice. This instability helps explain both the patchiness of the evidence and the caution required when converting one fossil locality into a picture of the whole island.

Derryvree Beneath the Drumlins

The most illuminating Irish environmental evidence for the broad period comes from Derryvree near Maguiresbridge, County Fermanagh. Road cutting through a drumlin exposed freshwater silts and organic sediments lying between two tills. Till is sediment deposited directly by glacier ice. The sequence therefore records an earlier glaciation, followed by an interval in which the site was locally free of ice and supported water and vegetation, then a renewed ice advance that sealed the deposit beneath fresh glacial material.

A radiocarbon determination from the Derryvree organic bed, Birm-166, produced an age of $30,500 \pm 1,100$ radiocarbon years before present. A radiocarbon age is not identical to a calendar age: atmospheric carbon levels have varied through time, so laboratory results require calibration. Under modern calibration, the date corresponds broadly to a calendar range spanning several millennia, commonly expressed at roughly 36,900–31,700 calibrated years before present. The modern point represented by 31,024 BCE falls within that broad range. It does not identify the beginning, end or a particular season of the Derryvree wetland.

Plant macrofossils, pollen and other environmental remains from the buried sediments indicate a cold, open and treeless setting. Sedges, mosses, dwarf shrubs and arctic-alpine plants belonged to a wet, tundra-like mosaic rather than to the oak, ash and hazel woodland of later Ireland. Records of bogbean, water-milfoil, mountain-avens, dwarf willow and clubmoss point to shallow freshwater, marshy margins and patches of low vegetation. Such evidence supports a landscape of pools, sedge beds and exposed ground, with local water sustaining plant communities even under a harsh climate.

‘Muskeg’ is a useful, if imperfect, descriptive term for this kind of mossy, waterlogged ground. It should not suggest a stable modern peat bog transplanted unchanged into the Pleistocene. Derryvree records a dynamic freshwater environment subject to sedimentation, freezing, thawing and shifts in water level. Its importance is precisely that it proves an ice-free interval in this part of Ulster before later ice buried the evidence. It supplies an ecological window, not a map of every valley in Ireland.

Reindeer, Carnivores and Cave Evidence

In southern Ireland, Castlepook Cave near Doneraile in County Cork provides a different sort of archive: bones accumulated in limestone passages over more than one phase of the Late Pleistocene. Work by the Irish Quaternary Fauna Project and later redating has shown that Ireland supported a considerably richer cold-stage mammal fauna than its present-day fauna implies. Castlepook's material includes reindeer, giant deer, brown bear, wolf or fox, hare, lemming, spotted hyaena and woolly mammoth, though not all remains derive from one moment, one chamber or one undisturbed deposit.

The fauna makes ecological sense in an open, cold landscape. Reindeer are adapted to seasonal grazing across broad, largely treeless country; lemmings indicate northern conditions; and large herbivores could support formidable scavengers and predators. Spotted hyaenas in particular matter because caves may have been dens or places to which carnivores dragged carcass parts. A bone in a cave is therefore not automatically proof that its animal died there, much less that people occupied the cave. Tooth marks, breakage, water movement, gravity and early collecting practices can all complicate the route from living animal to museum specimen.

Some re-dated Castlepook bones belong broadly to MIS 3, and research has placed spotted hyaenas and other mammals in Ireland between about 45,000 and 30,000 years ago. That supports the conclusion that animals repeatedly reached and used parts of the island during a period relevant to 31,024 BCE. It does not show that every listed species lived side by side at Derryvree, or that a single 'Ice Age community' persisted unchanged for fifteen millennia. The cave's power lies in demonstrating presence across a long, fluctuating period; its limitation lies in the mixing and incomplete context of its collection.

The Human Question

The most provocative item associated with this horizon is a reindeer femur from Castlepook reported to carry a deep mark interpreted by Ruth Carden as a fresh-bone cut or chop made by a sharp stone tool. Public accounts have connected the bone with an age of about 33,000 years. If the modification is securely shown to be anthropogenic and contemporary with the animal's death, it would be major evidence that a person handled, and perhaps butchered, a reindeer in Ireland long before the Last Glacial Maximum.

But this is a proposed indication of human activity, not a licence to populate Ireland with a known Palaeolithic society. The bone comes from an old cave collection rather than a modernly excavated occupation surface with a complete stratigraphic record. A radiocarbon date fixes the death of the animal, not necessarily the instant at which a surface mark was made. Nor does one potentially modified bone establish a camp, a route, a population size, a season of visit, a language or a lasting settlement. Recent work at Castlepook is explicitly seeking the crucial associated evidence: in-situ stone tools, hearths, charcoal, further modified bone and securely dated deposits.

It is reasonable to say that *Homo sapiens* groups elsewhere in north-west Europe at this time possessed stone technologies and drew heavily on animal resources. It is not responsible to transfer their clothing, artistic practices, kinship arrangements or ritual life wholesale to Ireland. No contemporary Irish dwelling, burial, ornament, cave art, tool assemblage or human remains has yet been established for this date. The responsible conclusion is smaller but still remarkable: an Irish reindeer bone may preserve evidence of human intervention, while the question remains under investigation.

What Cannot Be Recovered

Political affairs, diplomacy and organised conflict are beyond the evidence. There were no states, frontiers or institutions that archaeology can identify in Ireland around this point. Nor is there evidence for farming, herding, villages, fields, metalworking, long-distance trade networks or formal religious monuments. Claims about tribal names, chiefs, warfare or a distinctive Irish belief system would be inventions. Even if small human parties occasionally reached the island, their social organisation and movements cannot be recovered from the present record.

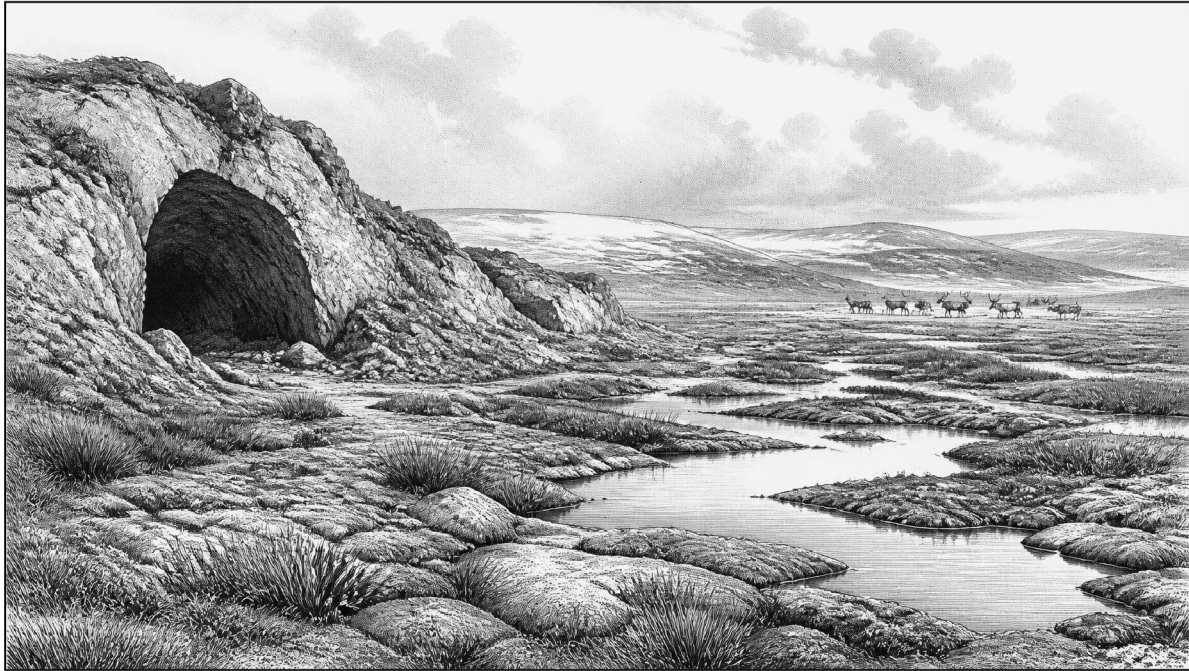
The economic reality most securely visible is ecological rather than commercial: plants grew in cold wetlands; herbivores moved through open country; carnivores exploited carcasses and caves; ice and water repeatedly reorganised viable terrain. If people were present, hunting and carcass processing are the only activities tentatively suggested by the Castlepook femur, and even that rests on interpretation still awaiting fuller confirmation. There is no evidence for exchange or seaborne trade.

For Ireland around 31,024 BCE, the central historical development is therefore environmental opportunity bounded by instability. Derryvree shows an ice-free freshwater corridor in Fermanagh within a wide calibrated interval. Castlepook shows that cold-stage mammals reached Cork and that caves preserved traces of their passage. Together they reveal an island neither empty in the ecological sense nor securely documented as inhabited by people: a changing northern landscape, rich in animal life, later transformed and partly erased by ice.

Chapter 078 of 100

31023 BCE

Mammoth Cave's Bone Archive ^[78]



The label 31,023 BCE is a modern way of locating a very remote point in time, not a year that anyone in Ireland could have named, recorded or experienced as a date. No archaeological evidence can isolate an event, a ruler, a journey or even a single human lifetime to this calendar year. The responsible frame is therefore a broad one: Ireland in the later part of Marine Isotope Stage 3, within the Midlandian, the Irish expression of the last glacial cycle. Radiocarbon chronologies at this depth are necessarily ranges, and conventional radiocarbon ages must be calibrated against changing atmospheric carbon levels. Around this notional year, the island's history is principally an environmental and faunal history, with only a debated hint of human activity.

A Date Without a Chronicle

In archaeological convention, “before present” means before AD 1950. A modern BCE conversion can make an ancient age look misleadingly precise. The best evidence relevant to this point comes from deposits dated over centuries or millennia, not from a calendar. At Derryvree near Maguiresbridge, County Fermanagh, organic silts produced a conventional radiocarbon determination of $30,500 \pm 1,170$ radiocarbon years BP. Calibration gives a broader and differently shaped calendar range rather than one neat equivalent. Castlepook Cave, near Doneraile in north County Cork, has yielded animal bones spanning a long part of the Ice Age; revised dates show that some are substantially older than earlier measurements suggested. These records illuminate a changing Ireland around the thirty-first millennium BCE, but neither proves conditions everywhere on the island nor identifies one particular year.

The evidence is unusually fragile because much of it survived only in caves, buried wet sediments and old museum collections. Later glaciers eroded, reworked or buried great stretches of the earlier landscape. Moreover, nineteenth- and early twentieth-century cave excavations did not always retain the stratigraphic

information expected today. A bone can establish that an animal reached Ireland; it cannot by itself show the size of a population, the precise route it used, or whether people were present when it died. This is why the period must be reconstructed from converging clues: sediment layers, plant remains, insect assemblages, animal bones, radiocarbon measurements and the wider geography of the British–Irish Ice Sheet.

Wet Tundra at Derryvree

Derryvree provides the clearest local environmental window. In 1969 a road cutting exposed freshwater silts and fine sands trapped between two thick till sheets within a drumlin. The position is crucial. It shows that an episode of open-water and wetland deposition occurred after one phase of ice movement and before another, demonstrating ice-free conditions at that place during an interval of the Midlandian. It does not demonstrate that all Ireland was ice-free simultaneously. The subsequent ice advance sealed the deposit, preserving an exceptionally rare sample of an Irish cold-stage ecosystem.

Pollen in the deposit was poorly preserved, but plant macrofossils, mosses and insects are more informative. Together they indicate an open, treeless tundra or muskeg: waterlogged ground with pools, plant-rich margins and mossy surfaces, set within a harsh periglacial climate. Herbaceous vegetation dominated. The record includes plants associated with cold, open habitats, while insect evidence supports shallow pools and damp organic ground rather than woodland. There is no basis for imagining the familiar green, wooded Ireland of later millennia. The local landscape was sparse, seasonally exacting and shaped by frost, wet ground and short growing seasons.

Such a landscape was not lifeless. Low plants, sedges, mosses and aquatic vegetation could sustain insects and herbivores, while thawed margins and freshwater basins concentrated resources. Yet it was a precarious ecology. Severe winters, permafrost or seasonally frozen ground, and rapid climatic shifts would have restricted plant cover and altered animal movements. Derryvree is therefore valuable not merely as a list of fossil species, but as evidence for a habitable patchwork at the edge of a glacial world. It reveals environmental opportunity as well as constraint.

Castlepook's Cold-Stage Fauna

Nearly 300 kilometres to the south-west, Castlepook Cave offers a different archive. Also known as Mammoth Cave, it is Ireland's richest known site for vertebrate remains from the period leading towards the Last Glacial Maximum. Excavations recovered more than 2,000 bones from a complex limestone cave system. Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena; later cold-stage material also includes Arctic fox, wolf, collared lemming and Norwegian lemming. The assemblage establishes that Ireland, at least intermittently, supported or received a far richer large-mammal community than the island possesses today.

The cave should not be mistaken for an intact snapshot of one day or one herd. Its bones accumulated across a very long span, conventionally dated at the site between roughly 45,700 and 19,950 radiocarbon years BP, and water disturbance obscured parts of the original contexts. Spotted hyenas may themselves have carried carcass parts into the cave, while natural deaths, scavenging and sediment movement all contributed to the deposit. Consequently, it is not safe to place every listed species together in the same valley in 31,023 BCE. What Castlepook securely provides is evidence for a sequence of cold-stage animal communities and for ecological connections with Britain and continental Europe before Ireland became permanently isolated by rising seas.

Reindeer are especially important to the period's possibilities. They were well adapted to exposed, cold terrain and could have moved through open country in seasonal patterns. Mammoth remains show that the island was at times reachable by animals suited to steppe-tundra conditions. Hyena, wolf and Arctic fox reveal a food web containing powerful predators and scavengers as well as herbivores. But animal presence should not be simplified into a ready-made hunting landscape. The bones do not tell us how dense herds were, whether crossings occurred annually, or whether food was abundant in every season. They demonstrate potential resources and ecological movement, not predictable plenty.

The Human Question

A reindeer femur from Castlepook has made this remote era historically arresting. Zooarchaeological examination has interpreted a deep mark on it as damage made by a sharp stone implement during the processing of fresh bone. If that interpretation is confirmed and the mark is contemporary with the animal's death, it would indicate human handling of a reindeer in Ireland about 33,000 years ago, far earlier than the securely established post-glacial settlement record. It is an important hypothesis, and one that deserves further microscopic, taphonomic and contextual testing.

It is not, however, enough to populate Ireland with a settled Upper Palaeolithic community. No securely associated hearth, dwelling, stone-tool assemblage, burial, human bone, occupation floor or repeated camp of comparable age has been recovered from the island. The femur entered a cave archive affected by older excavation methods and complicated depositional processes. Nor does an animal's radiocarbon date automatically date a cut mark independently. The most careful conclusion for around 31,023 BCE is that people may have reached or visited Ireland during this broader cold-stage interval, perhaps briefly and perhaps to exploit animal resources, but sustained occupation remains unproven.

Society Beyond the Evidence

That limit governs every human theme normally expected in a year-by-year history. There is no evidence for a polity, leadership, territory, diplomacy, warfare, formal trade network, permanent settlement or named community in Ireland at this time. There are no grounds for assigning language, ancestry, social rank, kinship rules or gendered tasks. Likewise, no shrine, grave, art object or ritual deposit can responsibly illuminate religious belief. The absence of such evidence does not prove that visiting people had no culture or social life; it means that the Irish record does not preserve it in a form that can be demonstrated.

Even everyday economy must be expressed conditionally. If people did reach this landscape, the practical attraction of a reindeer carcass would have included meat, marrow, hide, sinew, antler and bone. Such uses are well documented among Upper Palaeolithic hunter-gatherers elsewhere, but Castlepook's single controversial mark cannot show which portions were removed, whether hunting rather than scavenging occurred, or whether any material was transported away. There is no evidence in Ireland at this date for farming, livestock, pottery, metalworking, boats, constructed routes or organised exchange. The relevant economy was ecological before it was archaeological: seasonal vegetation, freshwater, mobile animals and the changing accessibility of land.

Ice, Connections and Change

Ireland's regional position was changing as ice sheets expanded towards the Last Glacial Maximum, whose principal phase came later, broadly between about 27,000 and 21,000 years ago. Lower sea levels altered coastlines and reduced the water barriers between Ireland, Britain and continental north-west Europe, but the exact configuration of land, sea ice, glaciers and viable passage changed repeatedly. It is therefore unwise to describe a simple land bridge or a single migration route. Faunal connections demonstrate that animals crossed during favourable intervals; they do not establish a continuously open corridor for humans.

The most important development around this notional date was thus not a political event but a threshold in environmental history. Derryvree records a cold freshwater wetland in Fermanagh during an ice-free interval. Castlepook preserves the bones of large mammals and carnivores that reached southern Ireland across a wider Pleistocene timespan. Together they show an island—or, more precisely, a fluctuating north-western peninsula and island-margin—within an unstable glacial world. The evidence allows a vivid but bounded picture: open tundra, pools and mossy wet ground; reindeer and other cold-adapted animals moving through favourable landscapes; predators using caves; and perhaps an exceptionally early human encounter with a carcass. Beyond that threshold lies conjecture, not history.

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31022 BCE

Bogbean, Hyena and Reindeer^[79]



Modern calendar-year precision is not available for Ireland in 31,022 BCE. This number is a convenient position on a retrospective calendar, not a date at which archaeology can identify an event, community or individual. In radiocarbon terms it sits at roughly 33,000 years before present, within Marine Isotope Stage 3 (MIS 3), a long and highly unstable part of the Late Pleistocene. The closest unusually informative Irish environmental sequence, at Derryvree near Maguirebridge in County Fermanagh, has a calibrated range of about 36,900–31,700 years before present. It therefore overlaps the broad timescale of this entry, but cannot illuminate one particular year. Its value is that it preserves a rare window onto an Irish landscape that later ice buried and reshaped.

A Wetland Between Glaciers

At Derryvree, roadworks in 1969 cut through a drumlin: one of the streamlined hills formed by moving glacier ice. Beneath and above the exposed deposit lay two separate sheets of till, unsorted sediment left directly by ice. Between them was a freshwater sequence of silts and fine sands, including organic material. A conventional radiocarbon determination from that deposit, Birm-166, was 30,500 years before present, with a substantial error range. Calibration converts it into a wider calendar range rather than a single date. The basic conclusion is robust: before a later ice advance overwhelmed the location, freshwater pools and wet ground existed there during a cold phase of the last glacial cycle.

This is an important corrective to any image of a uniformly ice-covered Ireland at all times in the Ice Age. The island experienced repeated climatic changes, and the British–Irish Ice Sheet grew, retreated and reorganised over many millennia. Around the broad interval relevant to 31,022 BCE, conditions were cold and periglacial in at least parts of Ireland: shaped by frost, seasonal thaw, sparse vegetation and nearby or recurrent glaciation. Yet the Derryvree deposit proves that a local wetland ecosystem could function

between glacial episodes. It should not be expanded into a complete map of the island. Southern coastlands, uplands, river valleys and the Irish Sea basin may have differed sharply in ice cover, drainage and habitability.

The Evidence of Moss and Sedge

Derryvree's pollen, plant macrofossils, mosses and insects offer the clearest evidence for everyday conditions, although "everyday" here means ecological rather than human life. The assemblage points to open tundra and a treeless muskeg: waterlogged ground with mossy vegetation, sedges, grasses and herbs, broken by pools rich in plant matter. Finds associated with the deposit include plants with modern northern or alpine affinities, among them bogbean (*Menyanthes trifoliata*), mountain-avens and dwarf willow. Juniper and other dwarf shrubs may have occurred in the wider open ground. Tree pollen was extremely limited and is not reliable evidence for a forest; it may have travelled far or been redeposited from older sediments.

This was no pristine white desert. In the growing season, low vegetation and wetland plants could make sheltered ground productive, while winter brought severe cold. The landscape was probably patchy: shallow freshwater, sedge margins, stony or sandy ground, moss mats and exposed herb-rich terrain. Insects from the deposit reinforce the interpretation of a cold, open setting. What the record does not provide is a complete climatic diary. It cannot establish the temperature on a given day in 31,022 BCE, annual snowfall, or whether the site was continuously ice-free throughout the whole date range. It demonstrates conditions when the sediments accumulated.

An Island of Large Mammals

Far to the south, Castlepook Cave, also known as Mammoth Cave, near Doneraile in County Cork, provides a complementary but complicated animal archive. Excavations begun in 1904 recovered bones from cave sands and passages. The National Museum of Ireland holds part of this collection, including remains of spotted hyena. Re-dating and reassessment have shown that several animals represented in the cave belong much earlier in MIS 3 than older twentieth-century dates had suggested. The cave is consequently central evidence that Ireland was reached by a remarkably diverse cold-stage fauna before the Last Glacial Maximum.

The securely identified faunal list associated with this broad period includes reindeer, woolly mammoth, giant deer, mountain hare, fox, wolf, brown bear, spotted hyena, Arctic lemming and Norway lemming, as well as birds. Not every species necessarily lived beside every other at the same moment, nor should all finds be assigned to exactly 31,022 BCE. Cave deposits accumulate over long spans, while carnivores, water, falling sediment and earlier excavation methods can mix material. Nonetheless, the combined evidence establishes that Ireland supported, or was repeatedly visited by, large herbivores and formidable predators during favourable portions of MIS 3.

Reindeer are especially revealing because they imply open country with extensive grazing and browsing opportunities, not a closed woodland. Mammoths and giant deer indicate that substantial herbivore biomass could intermittently be sustained. Spotted hyenas add a different dimension. Their remains may reflect a denning or scavenging use of caves, rather than an open-air hunting scene, but they confirm that Ireland's food webs then included large carnivores absent from the modern island. The animal evidence is more secure than any reconstruction of a particular herd route, migration season or population size.

The Reindeer Bone Question

One Castlepook reindeer femur has attracted particular attention because it bears a deep mark interpreted as having been made on fresh bone by a sharp stone implement. If that diagnosis is confirmed, it would be evidence that a person or a very small party processed a reindeer in Ireland during MIS 3, vastly earlier than the long-established record of post-glacial settlement. It is a consequential possibility, but it must be expressed cautiously. A radiocarbon determination dates the animal bone, while the identification of a surface mark as a human tool cut is a separate taphonomic judgement. The early excavations also did not preserve the stratigraphic controls expected of a modern excavation.

Thus, the marked femur is not evidence for a village, a permanent population, a named people or a settled Irish Palaeolithic society. Nor does it establish that humans were present in the calendar year 31,022 BCE. At most, the responsible interpretation is of potential brief human activity within a broad Late Pleistocene interval: perhaps carcass processing by mobile hunter-gatherers who had reached Ireland during an accessible phase. Renewed fieldwork at Castlepook in 2022 located surviving deposits and has begun testing the cave's archaeological potential, but it also demonstrates why undisturbed, well-dated contexts are essential before large claims are made.

No Politics, But Real Social Limits

There is no evidence from Ireland at this depth of time for political institutions, rulers, diplomacy, territorial states, formal warfare or writing. There are no known houses, hearths, graves, tool assemblages, monuments or artworks securely attributable to this date. Accordingly, an account of "politics" must begin with absence: none can responsibly be reconstructed. If people did visit, their social organisation, language, kinship, beliefs and cultural affiliation are unknown. Comparisons with Upper Palaeolithic groups elsewhere in north-west Europe can suggest that small, mobile bands may have organised seasonal hunting, shared skills and maintained wide social networks, but that is comparative interpretation, not direct Irish evidence.

The same restraint applies to religion and learning. Caves can later acquire cultural significance, but Castlepook's Pleistocene bones do not demonstrate ritual, cave art, myth or funerary practice. The likely expertise involved in travelling through a cold and changeable landscape, finding prey, working stone and processing hides would have depended on knowledge transmitted between people. Yet no artefact from this interval in Ireland currently allows that knowledge to be described. There is likewise no evidence for exchange networks or trade in the normal archaeological sense. Any human arrival would have required movement across a changing maritime and glacial landscape, but the route—whether by exposed coastal terrain, short water crossings, ice margins or a combination—remains unresolved.

The Coming Transformation

The greatest historical development relevant to this date was environmental. MIS 3 did not lead smoothly towards warmer conditions. Climatic oscillations continued, and the major expansion of the British-Irish Ice Sheet came later, principally during MIS 2. At its maximum, broadly after about 26,000 calibrated years before present, ice covered much or all of Ireland and profoundly altered its terrain. Earlier soils, campsites and animal traces were eroded, buried or redeposited. That destructive history

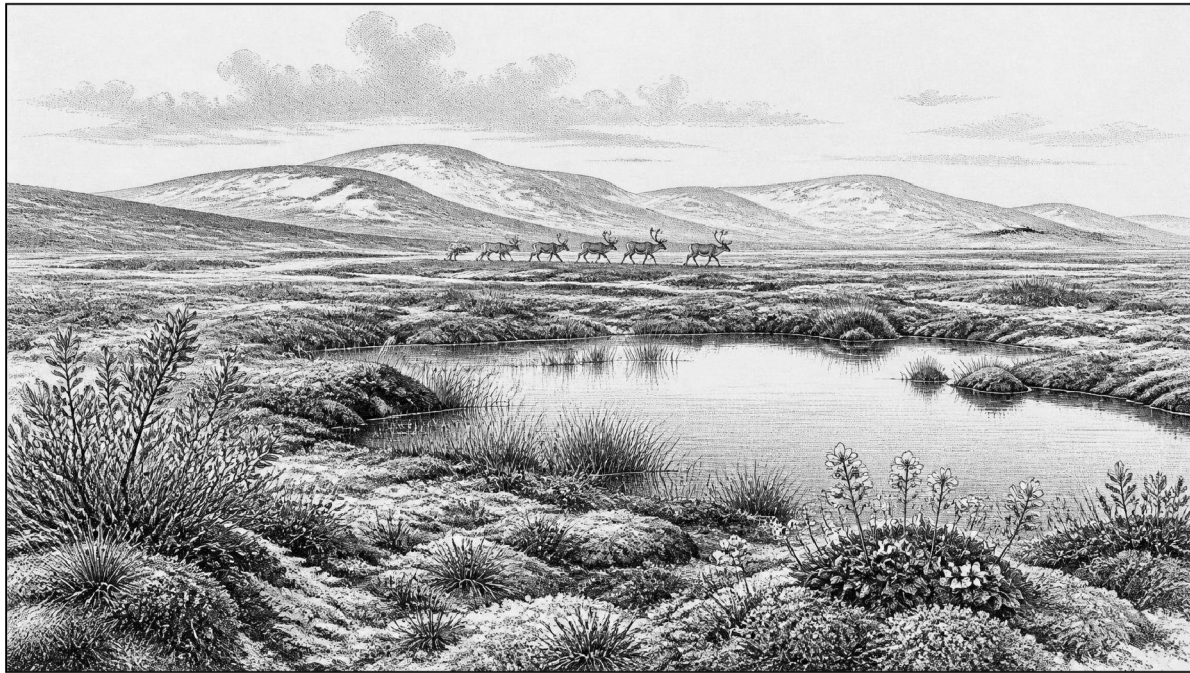
helps explain why the evidence for the island around 31,022 BCE is so slight and so dependent on exceptional sealed contexts: a Fermanagh wetland between tills, a Cork cave archive, and bones preserved in museum collections.

Ireland at this time was therefore neither a blank nor a comprehensible human homeland. It was a changing northern landscape in which freshwater wetlands briefly persisted, tundra plants grew, and cold-adapted mammals ranged across at least some regions. The possibility of an ephemeral human encounter with reindeer is important precisely because it remains small and testable. The firm story is environmental and archaeological: around the broad timespan denoted by 31,022 BCE, Ireland lay within a volatile Ice Age world whose surviving evidence records resilient ecosystems, mobile animals and the approach of renewed ice.

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31021 BCE

Castlepook's Unsettled Femur^[80]



The label 31,021 BCE is a modern chronological convenience, not a recoverable year in Irish history. No Irish calendar, written record, settlement sequence or radiocarbon measurement can identify happenings in one particular year so far back in the Late Pleistocene. The most responsible account therefore concerns evidence with date ranges that overlap this point: fossil plants and insects sealed beneath glacial deposits in Fermanagh, animal remains from caves in the south, and wider reconstructions of climate and ice-sheet change. They reveal an Ireland shaped by severe cold, ecological fluctuation and advancing ice, not a land with identifiable rulers, communities or events.

A Date Within a Range

In calibrated terms, 31,021 BCE lies roughly 33,000 years before the conventional radiocarbon reference year of 1950. It falls within Marine Isotope Stage 3 (MIS 3), a long interval of the last ice age extending broadly from about 59,000 to 28,000 years ago. MIS 3 was not uniformly frozen or uniformly mild. Greenland ice cores and North Atlantic records show repeated shifts between colder stadials and relatively less severe interstadials, sometimes on a millennial scale. Conditions in Ireland changed accordingly, and no single description can safely be applied to every region or every century.

Radiocarbon dates add another necessary caution. A laboratory age in radiocarbon years is not itself a calendar date: atmospheric carbon levels changed through time. It must be calibrated against independently dated records, and the uncertainty becomes substantial at this antiquity. IntCal20, the current Northern Hemisphere calibration curve, reaches to 55,000 calibrated years before present, but it

does not convert a cave bone or a buried plant bed into a date precise to a season, generation or named year. This is why 31,021 BCE should be treated as a point within broad archaeological and environmental intervals rather than as an anniversary.

Land Before the Maximum Ice

Ireland had not yet reached the Last Glacial Maximum, when the last Irish Ice Sheet expanded across much of the island and onto the surrounding continental shelf. The most extensive later advance is generally placed around 27,000–23,000 calibrated years before present, although ice margins varied by region and reconstructions continue to be refined. Around the date considered here, parts of Ireland could be ice-free while others were influenced by glaciers, snowfields, permafrost and cold maritime weather. The familiar modern coast, river courses, soils and vegetation zones did not exist.

Sea level was lower globally than today because much water was locked in continental ice sheets. Yet lower sea level should not be turned automatically into a simple claim that Ireland was continuously joined to Britain or mainland Europe. Relative sea level around Ireland was affected not only by global ocean volume but also by the weight of nearby ice, which depressed the land. The routes by which animals, and potentially people, reached the Irish landmass changed through time and remain a difficult geological question. What can be said securely is that Ireland formed part of a wider north-west European climatic and ecological zone, rather than an isolated modern island with its present barriers.

The later ice advance also explains a central problem for archaeology. Moving ice erodes surfaces, redistributes sediment and removes or buries evidence. A small open-air camp, hearth or scatter of stone tools from this age could easily have been destroyed. Its absence is therefore not proof that nobody ever visited Ireland; equally, the erosive power of ice cannot be used to turn possibility into proof. The record is exceptionally selective. Caves and protected deposits matter because they retain fragments of a landscape that the ice elsewhere scoured away.

Derryvree's Buried Wetland

The clearest Irish environmental window overlapping this broad period is at Derryvree near Maguiresbridge in County Fermanagh. Roadworks in 1969 exposed a drumlin containing fine sands, silts and organic freshwater sediment trapped between two bodies of glacial till. Till is the mixed debris laid down by glacier ice. The sequence supplies an important relative chronology: an earlier phase of ice deposited the lower till; an interval followed in which freshwater sediment and organic material accumulated; then renewed ice deposited the upper till and sealed the earlier landscape.

The Derryvree organic material produced a conventional radiocarbon determination of about 30,500 radiocarbon years before present, with a large uncertainty. Published calibrated ranges place the freshwater episode broadly around 36,900–31,700 calibrated years before present, approximately 34,950–29,750 BCE. The requested date lies within that wide interval, but it cannot be assigned to a particular layer, pool edge or plant specimen. Derryvree is evidence for an episode of local ice-free ground and freshwater conditions; it is not a weather report for the entirety of Ireland on one year.

Its fossil record nevertheless gives a striking impression of the environment. Plant remains, pollen and insects indicate open, cold ground with wet hollows and shallow water rather than woodland. Sedges, mosses and aquatic plants grew around the basin, while dwarf willow, mountain-avens and other cold-tolerant vegetation point to a tundra-like or periglacial mosaic. Such evidence supports the existence of liquid water, seasonally productive wetland and patches of plant cover. It does not demonstrate a lush

landscape, farming, or stable conditions across the island. The important point is variation: even in an ice-age Ireland, sheltered freshwater habitats could support distinctive communities of plants and small animals.

Castlepook and the Animal World

In north County Cork, Castlepook Cave near Doneraile preserves another kind of archive. Early twentieth-century excavation recovered a mixed assemblage of Ice Age animal remains, while more recent work has re-examined the old material and sought undisturbed deposits. Re-dating with improved collagen pretreatment has shown that some earlier dates from Castlepook and other southern Irish caves were too young by thousands of radiocarbon years. The cave consequently demonstrates that parts of Ireland supported a more varied MIS 3 fauna than older chronologies had suggested.

Among the animals represented in the wider Castlepook record are reindeer, giant deer, woolly mammoth, spotted hyaena, brown bear, foxes, hares and cold-adapted small mammals. Not every species necessarily lived together, and cave assemblages are not simple snapshots of a single living landscape. Carnivores may have carried prey into caves; animals could die naturally in fissures; water could move bones; and antiquarian excavation did not meet modern recording standards. Still, the fauna establishes repeated access to Irish environments by large herbivores and predators during phases of the last glacial cycle.

Reindeer are especially relevant to the public discussion of this date. A reindeer femur from Castlepook has been reported as bearing a deep mark interpreted as damage made by a sharp stone tool during butchery. The animal bone has been presented in County Cork heritage material as approximately 31,000 BC, while related scientific re-dating confirms that some Castlepook fauna belongs much earlier in MIS 3 than previously thought. If the mark is conclusively anthropogenic and contemporary with the animal's death, it would be momentous evidence that a person handled a reindeer in Ireland long before the final retreat of the ice.

A Claim Still Being Tested

That conditional language matters. A modified bone is not the same as an excavated campsite. There is no securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or cluster of butchered carcasses at Castlepook that can demonstrate a settled Upper Palaeolithic community around 31,021 BCE. The cave deposits are complex, and a surface mark needs taphonomic and microscopic assessment to distinguish deliberate cutting from damage caused by carnivores, sediment, excavation or later disturbance. The reported femur is an important lead, not a licence to write a detailed story of an Irish hunting party.

Comparison with Upper Palaeolithic societies elsewhere in north-west Europe can suggest what visitors, if present, may have known: stone-working, animal butchery, clothing suited to cold conditions, flexible shelters and long-distance social contacts were all well within the capacities of *Homo sapiens* at this time. But those are regional comparisons, not direct evidence from Ireland. No Irish artefact of this age presently demonstrates tool manufacture, clothing, ornament-making, art, language, music or ritual. Nor is there evidence from which to infer a named people, ethnic identity or permanent population.

What History Cannot Yet Supply

Political affairs, diplomacy and organised warfare are therefore beyond the evidence. There were no states, kingdoms, borders or institutions in the historical sense that can be recovered for Ireland at this date. If people entered the island, they would have done so as small, mobile hunter-gatherer groups operating in a changing landscape, but even that remains an interpretation contingent on the Castlepook evidence. There is no basis for assigning territory, leadership or conflict to them.

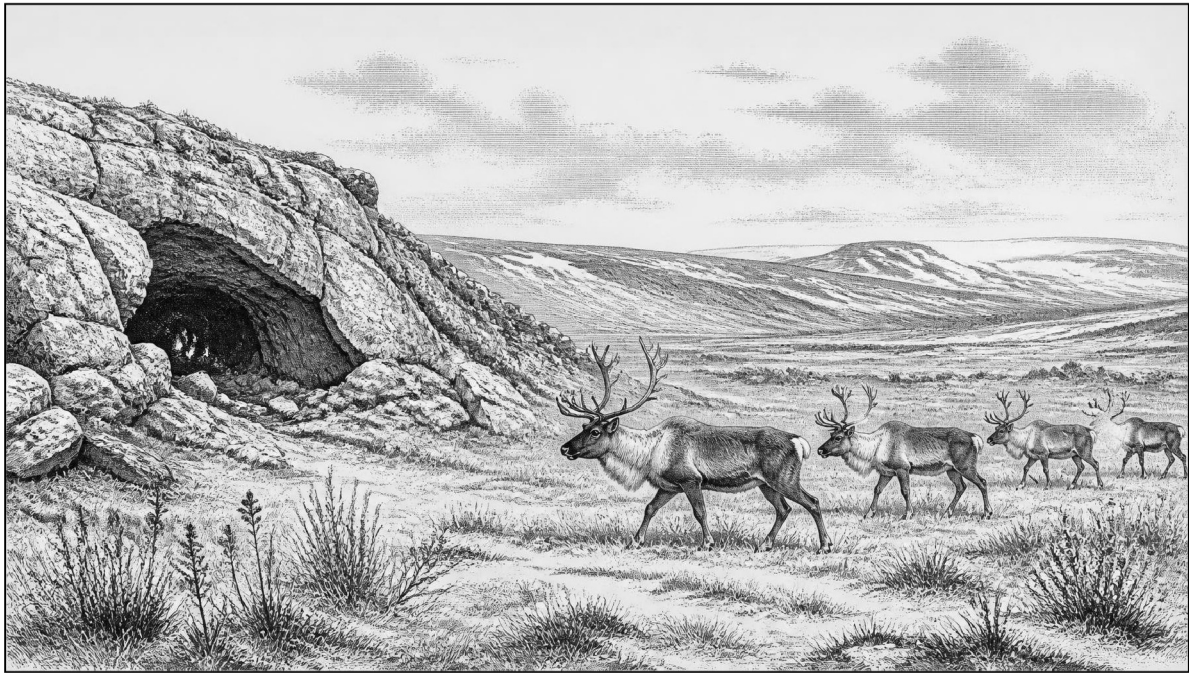
The same restraint applies to society and everyday life. The Derryvree wetland documents plants, insects and sediment; Castlepook documents animals and a possible human action. Neither supplies a house plan, a family group, a grave or a domestic assemblage. Religion and formal learning leave no securely dated Irish trace here. Economy and trade cannot be described beyond the potential use of local animal resources by any visitors. Agriculture, livestock keeping, pottery, metalworking and monument building lay many millennia in the future.

The principal development around this point was environmental, not political: Ireland was passing through a volatile stage of the last ice age, with cold open habitats, freshwater refuges, mobile animal populations and ice sheets that would later transform the island's surface. The surviving evidence is sparse but significant. It shows that the landmass was ecologically active, not simply an empty sheet of ice, and that Ireland's deepest human past remains open to revision through careful excavation, modern dating and the re-examination of older museum collections.

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31020 BCE

Castlepook's Provisional Encounter^[81]



Modern calendar-year precision is not available for Ireland at 31,020 BCE. The date is a backward projection of the modern calendar, not a date recorded by people then alive. In archaeological terms it falls roughly around 33,000 calendar years before present (cal BP, where “present” is AD 1950), in Marine Isotope Stage 3 of the Late Pleistocene. Radiocarbon ages at this depth of time must be calibrated and expressed as ranges; moreover, cave deposits and animal remains usually represent episodes spread across centuries or millennia, not a single year. The responsible subject is therefore Ireland in the decades around this nominal date, not an invented event on it.

A Landscape Before the Maximum

This was an Ice Age Ireland, but not yet the fullest extent of the last British–Irish Ice Sheet. The major local and global glacial maximum lay later, broadly between about 26,500 and 19,000 years ago. Reconstructions indicate rapid and regionally uneven ice-sheet growth during the preceding millennia. At roughly 33,000 cal BP, Ireland’s precise ice cover cannot be drawn with confidence for any one moment: evidence is stronger for later maximum limits and retreat than for the exact onset of ice expansion in every district.

That uncertainty matters. It is misleading to imagine either a uniformly ice-covered island or a wholly open one. The available evidence supports a changing mosaic: expanding ice centres and glaciers in some regions, cold exposed ground elsewhere, and habitats that could briefly support large mammals in at least parts of southern Ireland. Subsequent glaciation repeatedly eroded, buried and rearranged older landscapes. Much of the evidence for this period consequently survives not as settlements on open ground, but in caves, buried sediments, offshore cores, landforms and curated bone collections.

Castlepook Cave's Uneasy Evidence

The key Irish place for this approximate date is Castlepook Cave, near Doneraile in north County Cork. Excavated principally in the early twentieth century, the cave produced a remarkable collection of Late Pleistocene bones, including reindeer, woolly mammoth, giant deer and spotted hyaena. Later work by the Irish Quaternary Fauna Project and subsequent re-dating demonstrated both the importance and the difficulty of the archive: old excavations recorded contexts less precisely than modern investigations require, and improved pretreatment of bone samples has shifted some dates substantially older.

A reindeer femur from Castlepook has been presented by County Cork heritage researchers as dating to about 31,000 BCE and bearing a deep mark interpreted by palaeozoologist Ruth Carden as the result of cutting with a sharp stone tool. If that interpretation is correct, the mark is potentially Ireland's earliest evidence for a person processing an animal. It would be an extraordinary trace of an Upper Palaeolithic encounter: someone had access to a reindeer carcass and a sharp-edged implement in or near Ireland during a severe cold-stage interval.

The limits of that claim are as important as its promise. The bone itself dates the animal's life, not the exact instant of cutting; a single surface modification cannot establish whether people killed the reindeer, scavenged it, removed meat elsewhere, or merely handled part of an already dead animal. Castlepook has not yielded a securely associated hearth, stone-tool assemblage, dwelling floor, human burial or stratified camp of this age. Nor does the cave prove permanent settlement. Carnivores could drag bones underground, water and frost could disturb deposits, and nineteenth- and early twentieth-century excavation removed much contextual information. "Possible human activity" is therefore more accurate than "an Irish population".

Cold-Stage Fauna and Environment

Even without a demonstrable settlement, the animals from Castlepook illuminate a real Irish environment. Reindeer indicate open, cold country capable of sustaining grazing herds. Mammoth, giant deer and spotted hyaena belong to a wider north-west European Pleistocene fauna, although the mere presence of their bones in one cave does not prove that all species lived together at exactly 31,020 BCE. The refined chronology suggests that giant deer and spotted hyaena may have disappeared locally before the Last Glacial Maximum, around 40,000 cal BP. That is a useful warning against turning a cave fauna accumulated over long periods into a single picturesque scene.

The most defensible reconstruction is of a treeless or sparsely wooded cold landscape with grass, herbs and low shrubs in suitable exposed areas, interrupted by rock, wet ground, snow patches and advancing ice. Conditions would have varied sharply with altitude, aspect and climate fluctuations. Limestone caves around the Blackwater valley could provide sheltered dens for carnivores and traps for archaeological information, but they were not necessarily human homes. A cave bone assemblage records animal movement, predation, scavenging and geological processes as much as it records people.

There is no evidence from Ireland at this date for farming, livestock, pottery, metalworking, monumental construction or woodland clearance. Nor can we reconstruct fields, villages or a settled seasonal round. If visitors did reach the island, they were almost certainly mobile hunter-gatherers operating within the wider Upper Palaeolithic world of north-west Europe, where animal carcasses, hides, marrow and bone were valuable resources. That is an inference from the broader period, however, rather than a directly excavated Irish toolkit.

People, Movement and the Sea

The apparent Castlepook cut mark raises the possibility of movement into Ireland during a phase when sea levels were lower than today and the geography of the Irish Sea differed profoundly. It does not demonstrate a simple dry-land route from Britain, still less a continuous land bridge to continental Europe. Ice, meltwater, coastlines and sea passages changed over time, while later submergence has removed or concealed many potential coastal sites. Any human arrival may have involved a short visit across a shifting maritime or glacial landscape rather than colonisation.

There is no evidence for named peoples, political authority, diplomacy or territorial frontiers in Ireland at this time. A solitary possible butchery trace cannot reveal language, kinship rules, leadership or relations between groups. Equally, there is no direct evidence for organised human conflict. The violent processes visible in the cave record are chiefly ecological: predators, scavengers, carcass transport and natural breakage. Calling hyaena activity “conflict” would confuse animal behaviour with human history.

Trade is also beyond the evidence. No securely dated Irish exchange goods, quarry sites or imported Upper Palaeolithic artefacts are known from around 33,000 cal BP. Stone tools would have been essential if the Castlepook incision was human-made, but no tool associated with the femur has been recovered. It is reasonable to say that a sharp lithic edge was used only conditionally—if the mark diagnosis is accepted—not to claim an established Irish flint-working industry or trading network.

Culture Without a Settlement Record

Religion, art and learning leave no identifiable Irish evidence for this nominal year. There are no cave paintings, engravings, ornaments, burials or ritual deposits securely attributable to an Upper Palaeolithic community in Ireland. This absence should not be mistaken for proof that visitors lacked beliefs, stories, technical knowledge or social traditions; mobile people everywhere possessed them. It means simply that the Irish record does not permit those traditions to be described responsibly.

The strongest cultural lesson is methodological. Ireland’s deep prehistory is being revised not by spectacular monuments but by re-examining museum collections, applying improved radiocarbon methods, identifying animal species more securely and testing bone surfaces microscopically. Castlepook’s reindeer femur is important precisely because it is so slight: one mark, on one old specimen, challenges a long-held assumption that Ireland had no Palaeolithic human story at all. Yet it also demonstrates why claims must remain proportionate to evidence.

An Island at the Edge

At around 31,020 BCE, Ireland lay at the north-western edge of the Upper Palaeolithic world and on the threshold of increasingly extensive glaciation. The island was not politically empty in the modern sense, nor was it a future nation awaiting settlement; those concepts do not apply. It was a changing Pleistocene landscape in which large mammals sometimes found viable ranges and in which people may have appeared fleetingly. The later ice advance would scour and bury much of what they could have left behind.

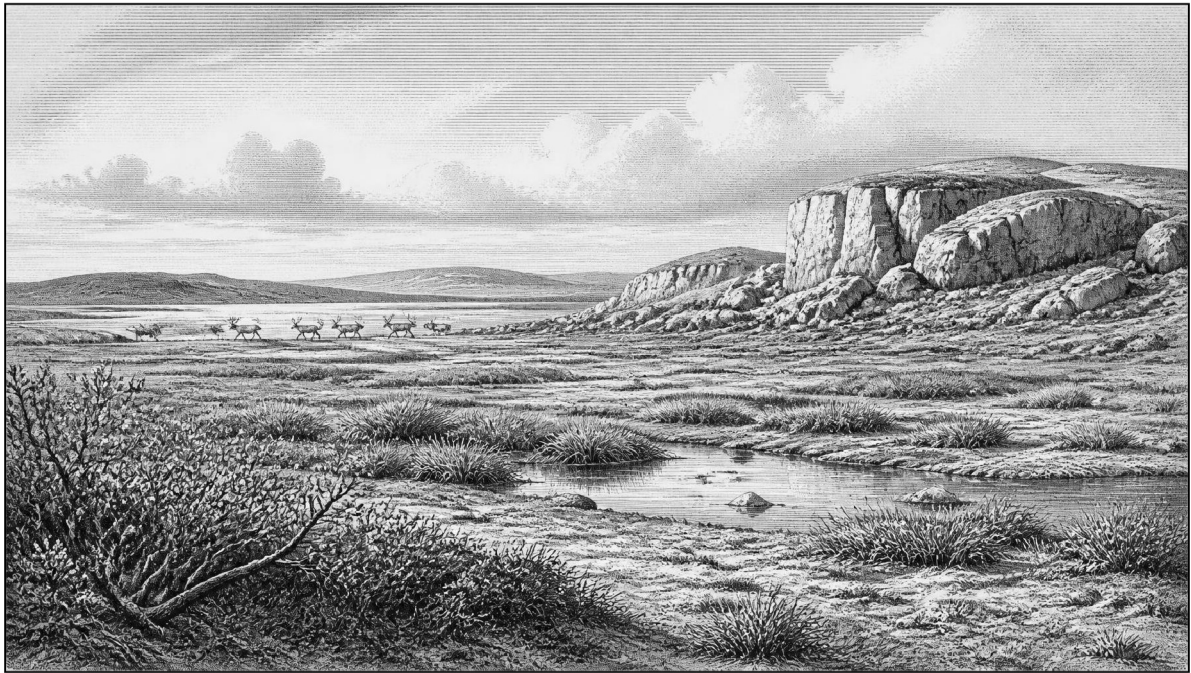
For that reason, the annual entry for this date is necessarily a record of uncertainty as well as discovery. Castlepook offers a plausible, potentially transformative sign of human handling of reindeer around this broad interval. It does not yet give Ireland a dated camp, a community or a continuous

population. The most historically sound conclusion is modest but significant: around this point in deep time, southern Ireland formed part of a cold, dynamic ecological zone visited by Pleistocene animals, and perhaps—briefly—by people.

Chapter 082 of 100

31019 BCE

Hyena Hall's Shifting Ground^[82]



A Date Without an Annual Record

31,019 BCE is a modern chronological label, not a year that can be recovered from an Irish annal, settlement sequence or datable human lifetime. In the archaeological convention of counting backwards from AD 1950, it lies roughly 32,970 years before present. At such depth, radiocarbon ages must be calibrated, and even calibrated results commonly span centuries or millennia. The responsible subject is therefore Ireland during the later part of Marine Isotope Stage 3 (MIS 3), rather than an invented event on a particular day or in a particular year. The evidence consists chiefly of cave fauna, buried sediments, pollen and plant remains, glacial landforms, and the changing reliability of the dates assigned to them.

MIS 3, broadly about 57,000–29,000 calibrated years ago, was not a uniform “Ice Age” climate. It included sharp oscillations between colder stadials and relatively milder interstadials. Ireland’s position on Europe’s north-western edge made its environments especially sensitive to these shifts, to sea-level changes and to the growth of the British–Irish Ice Sheet. By the global Last Glacial Maximum, after about 26,500 calibrated years ago, ice would extend widely across Ireland; but 31,019 BCE precedes that maximum. It belongs to a difficult transitional world whose local landscapes must be reconstructed site by site.

An Island Not Yet Familiar

It would be misleading to picture the modern island, coastlines and counties simply transported into the distant past. Sea level was substantially lower during the last glacial cycle, exposing broad shelves now under the Atlantic and Irish Sea. Ireland's connection to Britain and the continent altered repeatedly as ice, sea level and coastlines changed. The fossil record demonstrates that terrestrial mammals did reach Ireland in this period, but it cannot identify the exact route, season or frequency of every crossing. Nor does it establish that all parts of the landmass were simultaneously open, habitable or connected.

At the scale of this nominal date, the best conclusion is that parts of Ireland supported animal communities before the final, expansive ice-sheet phase. Yet ice margins were dynamic and regional conditions differed. Evidence from later ice-sheet advance and retreat confirms that the last British-Irish Ice Sheet was not a simple, static cap: its growth and collapse involved major marine and terrestrial sectors, fast-flowing ice streams and shifting margins. That later history helps explain why older landscapes and archaeological traces are rare, disturbed or buried beneath till.

Castlepook's Faunal World

The most evocative evidence for Ireland around the broader 33,000-year horizon comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavated principally in the early twentieth century, its limestone passages yielded Ireland's richest known assemblage of pre-Last Glacial Maximum vertebrate remains. The cave's historical gallery name, Hyena Hall, preserves an important fact: spotted hyena was among the animals represented there. The National Museum of Ireland identifies a Castlepook skull as *Crocota crocuta*; the site also produced remains attributed to reindeer, mammoth, giant deer, bear, wolf, foxes and lemmings.

Those finds establish an Ice-Age fauna, not a neatly contemporaneous herd standing together on a single Cork plain. Cave assemblages are accumulations. Carnivores drag in prey and carrion; animals die naturally; water shifts bones; sediments are reworked; and early excavators often recorded locations less precisely than modern field methods demand. Recent redating has moreover shown that several older Irish cave radiocarbon determinations were too young, probably because improved pretreatment can remove later contamination from bone collagen. Castlepook remains indispensable, but it must be read as a time-averaged archive rather than a frozen scene.

Nevertheless, the fauna allows a restrained reconstruction. Reindeer, lemmings and Arctic fox point towards cold, open habitats; mammoth and giant deer imply enough vegetation, at least seasonally, to sustain large herbivores; wolves and hyenas reveal predators and scavengers within a substantial food web. This was not the densely wooded Ireland of later millennia. It was likely a treeless or very sparsely wooded mosaic of grassland, herb-rich tundra, damp hollows and exposed ground, varying with climate, drainage and altitude. The precise abundance of each species is unknown, and absence from a cave collection is not proof that an animal was absent from Ireland.

Wet Ground Beneath Fermanagh

A contrasting record lies at Derryvree, near Maguiresbridge in County Fermanagh. Roadworks exposed freshwater silts and fine sands containing organic material between two layers of till, sediment deposited by glacier ice. This sequence provides a powerful relative chronology: ice advanced or

deposited till; an ice-free freshwater environment existed at the site; then later ice again covered or affected the locality. The organic bed, known by its radiocarbon sample number BIRM-166, produced a conventional age of $30,500 \pm 1,100$ radiocarbon years BP. Calibration gives a broad calendar-age interval, commonly cited at roughly 36,900–31,700 calibrated years BP.

That range overlaps the modern label 31,019 BCE, but it does not date a single annual landscape. Nor can it demonstrate that the entire island was ice-free at once. Its value is more exacting and more important: it shows that an inland Fermanagh locality preserved a freshwater, periglacial environment between glacial episodes. Plant remains including sedges, mosses, dwarf willow, mountain avens, bogbean and aquatic taxa have been interpreted as evidence of cold, open wetland vegetation, with pools or slow water amid waterlogged ground. Such deposits preserve ecological conditions, not a human community.

A Possible Human Trace

One Castlepook object gives this period exceptional importance for Irish prehistory: a reindeer femur reported to bear a deep linear mark made while the bone was fresh. The mark has been interpreted as the result of a sharp stone tool used in butchery. County Cork heritage material presents it as a possible indication that Stone Age hunters processed reindeer in Ireland some 31,000 years ago. If secure, it would place human activity on the island far earlier than the terminal-Pleistocene evidence from County Clare that is presently better contextualised.

It should not, however, be converted into a story of an established Palaeolithic population in 31,019 BCE. The bone's radiocarbon age dates the animal's death, not necessarily the precise moment at which its surface was modified. Identifying a cut mark requires careful distinction from carnivore damage, abrasion, breakage and excavation damage. Crucially, no securely associated stone-tool assemblage, hearth, dwelling surface, human burial or repeated butchered deposit of comparable age has been recovered at Castlepook. The evidence may indicate a brief human encounter with a carcass; it does not demonstrate a permanent settlement, population continuity, language group or migration history.

Society Beyond Recovery

Consequently, political affairs, diplomacy and organised warfare cannot responsibly be described for Ireland at this date. There were no recorded polities, leaders, territories or treaties, and no material evidence from Ireland that supports assigning such institutions to a human group here. Nor is there evidence for farming, livestock keeping, pottery, metalworking, monuments, formal trade networks or permanent villages. If people visited, their social organisation would have been that of mobile Upper Palaeolithic hunter-gatherers known elsewhere in Europe; but applying that general comparison to Ireland remains interpretation, not direct proof.

The same boundary applies to religion, art and learning. No cave art, ritual structure, burial, ornament, inscribed object or musical instrument of this age has been found in Ireland. It is reasonable to say that the people of Upper Palaeolithic Europe possessed rich cultural lives, but it is not responsible to attribute any particular belief, ceremony or artistic tradition to a possible Irish visitor on the strength of one modified bone. Silence in the record may partly reflect later glaciation, erosion and the limited survival of open-air sites; it is still silence, not positive evidence.

Economy as Ecology

There is no demonstrable Irish economy in the usual historical sense. What can be discussed is the ecological basis on which a hypothetical visit would have depended. Large herbivores offered meat, marrow, hides, sinew and bone, while smaller mammals and birds broadened the available resource base. The visibility of reindeer and mammoth remains does not mean either animal was reliably available in every season. Herd movements, snow cover, severe cold, predator competition and shifting ice margins would have made travel and subsistence precarious.

“Trade” is likewise unsupported. Lower sea levels may have reduced water barriers at various times, but a physically broader landscape is not evidence of exchange between Irish groups, or between Ireland and Britain. The cave fauna does show biogeographical connection: animals reached the Irish landmass from wider north-west European populations during favourable phases. That is a statement about dispersal, not commerce.

What This Date Means

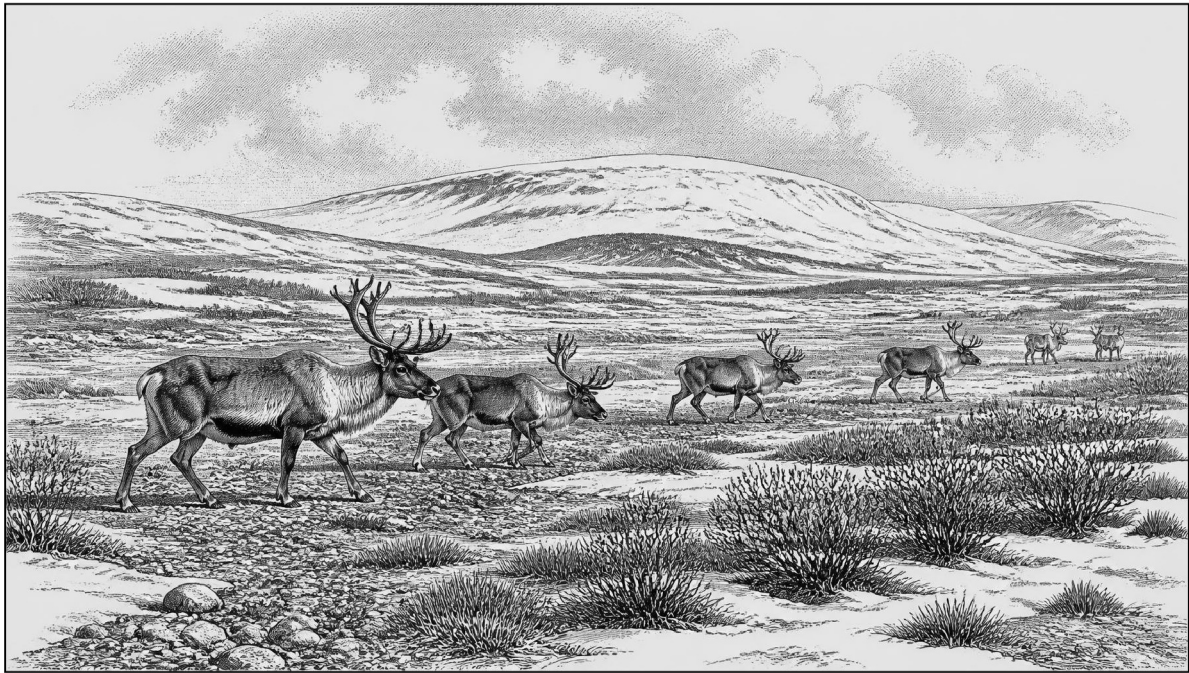
The most important development around 31,019 BCE is therefore neither a named event nor the beginning of an Irish historical tradition. It is the survival of fragmentary evidence for a pre-maximum Ice-Age Ireland: cold, exposed, ecologically varied and periodically accessible to large mammals. Fermanagh’s buried wetland and Cork’s cave fauna illuminate different elements of that world. Together they show that Ireland was not merely an empty blank before later ice, even though its human history at this date remains unproven beyond a compelling but contested clue.

Modern calendar precision gives this article a useful filing point; it must not give a false impression of certainty. The calibrated ranges, stratigraphic relationships and re-examined bones are the history. They reveal a changing land on the eve of far more extensive glaciation, and they set clear limits on what can honestly be claimed about the earliest possible people in Ireland.

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31018 BCE

Castlepook's Growing Ice Margin ^[83]



31,018 BCE is not a date at which Ireland can be described through an event, a ruler or a named community. It is a modern calendar label imposed on a period far beyond written memory. In archaeological terms it corresponds very approximately to 32,967 years before AD 1950, the reference point used for “before present” dating. Such arithmetic must not be mistaken for chronological precision: radiocarbon ages require calibration, and the useful evidence belongs to broad ranges measured in centuries or millennia. Around this notional point, Ireland stood within the Late Pleistocene, during Marine Isotope Stage 3 and the early build-up towards the Last Glacial Maximum.

The evidence is unusually thin but important. It comes chiefly from animal bones in caves, pollen and plant remains in buried sediments, glacial landforms, and modern reconstructions of ice-sheet growth. These sources illuminate changing environments and animal ranges far better than they reveal human lives. There were no states, political institutions, diplomatic contacts or recorded conflicts in Ireland in any sense that can be responsibly recovered. Whether people entered the island at all around this time remains an open archaeological question, not an established chapter of settlement.

A Date Without a Chronicle

Modern calendar-year precision is unavailable for 31,018 BCE. The date lies close to 33,000 years before present in simple numerical terms, but neither a radiocarbon determination nor an environmental sequence can identify what happened in a particular calendar year. A dated bone records, at best, when an animal died within a probability range; it does not automatically date a human action, a cave visit, or a settlement. Equally, a buried bed of plant-rich silt may represent years or centuries of deposition rather than a single episode.

The appropriate historical frame is therefore an interval: roughly the later part of Marine Isotope Stage 3, before the coldest and most extensive phase of the last British–Irish Ice Sheet. The Last Glacial Maximum is generally placed later, broadly between about 27,000 and 20,000 years ago, although ice-sheet margins did not reach their greatest extent everywhere at the same time. At about 33,000 years ago, climatic conditions were cold and unstable, while the ice system affecting Ireland was expanding unevenly. This was not yet a uniform white island sealed beneath maximum ice, but neither was it a familiar green landscape.

Ice Was Advancing, Not Yet at Its Peak

Recent reconstructions of the British–Irish Ice Sheet begin at 31,000 years before present because earlier margin evidence is sparse. They suggest centres of ice accumulation in Northern Ireland and Scotland, with smaller ice masses in south-west Ireland, including areas near Kerry and Cork. By about 29,000 years ago the ice sheet had expanded markedly; by around 28,000 years ago reconstructions depict ice covering almost all of Ireland. These are carefully modelled regional reconstructions, not a photograph of a single year, and their uncertainties matter greatly for a date around 31,018 BCE.

The broad implication is clear. Ireland was entering a severe phase of glacial growth. Snow surviving successive summers accumulated in uplands, glaciers flowed through valleys and across lowlands, and the sea level was much lower than today because immense quantities of water were held in global ice sheets. Coastlines lay far beyond their present positions on parts of the continental shelf. Yet low sea level did not create a simple, universally accepted land bridge between Ireland and Britain. The Irish Sea basin retained significant marine barriers, and the routes by which animals reached Ireland in different Pleistocene phases remain debated.

Glaciation also helps explain the poverty of the archaeological record. Ice erodes and redistributes sediments, while later meltwater and soil formation can obscure older surfaces. Any small open-air camp, hearth or scatter of stone tools from this period would have had little prospect of surviving intact. Caves and protected sediment traps offer better chances, but they too may contain material moved by water, carnivores, excavation or later human disturbance. Absence of evidence cannot demonstrate that no person ever set foot in Ireland; it does mean that claims of occupation must meet a very high evidential standard.

Castlepook and the Animal Record

The most revealing Irish locality for this broad period is Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations in the late nineteenth and early twentieth centuries, followed by later investigation and radiocarbon dating, produced Ireland's richest known pre-Last-Glacial-Maximum vertebrate assemblage. Its importance lies not in a neatly sealed occupation layer, but in the range of animals represented and in the possibility of refining their separate histories through direct dating.

Finds attributed to the broader Castlepook assemblage include woolly mammoth, giant deer, reindeer, brown bear, wolf, foxes, mountain hare, collared and Norwegian lemmings, and spotted hyena. Not all these animals necessarily lived together, and they cannot all be assigned to 31,018 BCE. Cave deposits accumulated across different episodes; some bones were introduced by carnivores, some may have been

moved by water, and older excavations did not record contexts to modern standards. The responsible conclusion is that, during parts of the interval before the ice maximum, Ireland supported or was visited by a strikingly varied cold-stage fauna.

That fauna points to open habitats rather than dense forest. Reindeer, lemmings and Arctic fox indicate cold conditions; mammoth, giant deer and horse records elsewhere in southern Ireland evoke extensive grass- and herb-rich ground within a varied tundra-steppe mosaic. The term “mammoth steppe” is useful only as a broad ecological comparison. Ireland’s terrain, rainfall, maritime exposure and shifting ice margins would have created local mixtures of exposed mineral ground, grasses, sedges, dwarf shrubs, wet hollows, river margins and seasonal snow cover rather than one continuous biome.

Spotted hyena is especially significant. Its remains at Castlepook demonstrate that a large social carnivore associated with continental Pleistocene faunas reached Ireland in at least one pre-maximum phase. Hyenas could drag bones into caves and heavily modify carcasses. Their presence is therefore both a clue to the wider food web and a warning against assuming that every broken or marked bone records human behaviour. The cave was a place in animal landscapes: a possible den, shelter, trap or repository over long stretches of time, not automatically a human dwelling.

Wetlands Beneath Later Glacial Sediment

In County Fermanagh, buried organic deposits at Derryvree and Maguiresbridge offer a different kind of evidence. There, silts and plant remains lie between layers of glacial sediment. Their preservation shows that, before renewed ice overran the area, freshwater pools, wet ground and sedge-rich or moss-rich habitats existed within a cold landscape. Fossil plant records include taxa suited to severe northern conditions, such as mountain-avens, dwarf willow, clubmosses and bogbean. They reveal environments that were biologically active, not a lifeless polar desert.

These Fermanagh beds cannot be pinned securely to the modern year 31,018 BCE, and their dating and correlation have long been discussed by Quaternary researchers. Their value is contextual. They show that ice advance and retreat were punctuated by ice-free or less glaciated intervals in which water, vegetation and animals could occupy parts of Ireland. They also warn against portraying the Late Pleistocene as a single, unchanging “Ice Age”. Climate oscillated; local conditions depended on elevation, drainage, proximity to ice, season and the shifting paths of storm systems over the North Atlantic.

The Human Question

A reindeer femur from Castlepook has brought 31,018 BCE into discussions of Ireland’s earliest possible human past. It has been reported as carrying a linear mark interpreted by some researchers as a fresh-bone cut or chop made with a sharp stone tool, and it has been associated in public heritage interpretation with an age of roughly 33,000 radiocarbon years. If that interpretation is sustained by further analysis, it could indicate that an Upper Palaeolithic person processed a reindeer in Ireland far earlier than the island’s securely documented later prehistoric settlement.

But the inference must remain limited. A radiocarbon result dates the animal bone, not necessarily the moment when a surface mark was made. A single marked specimen does not establish a camp, a resident population, a hunting territory, a migration route or a social group. Castlepook has not produced a securely associated stone-tool assemblage, hearth, house floor, human bone or undisturbed butchery site of comparable antiquity. Carnivore damage, sediment movement and the complex collecting history of the cave all require rigorous taphonomic testing.

Accordingly, it is not responsible to describe an Irish society, economy, religion, art, learning, trade network or warfare for this year. If people did reach Ireland, they may have been highly mobile Upper Palaeolithic hunter-gatherers operating at the far north-western edge of wider European worlds. That is an interpretation drawn from the European context, not a demonstrated description of an Irish community. We do not know whether a visit was seasonal or accidental, whether it involved one person or many, or whether it left any descendants on the island.

What Can Be Said of Life?

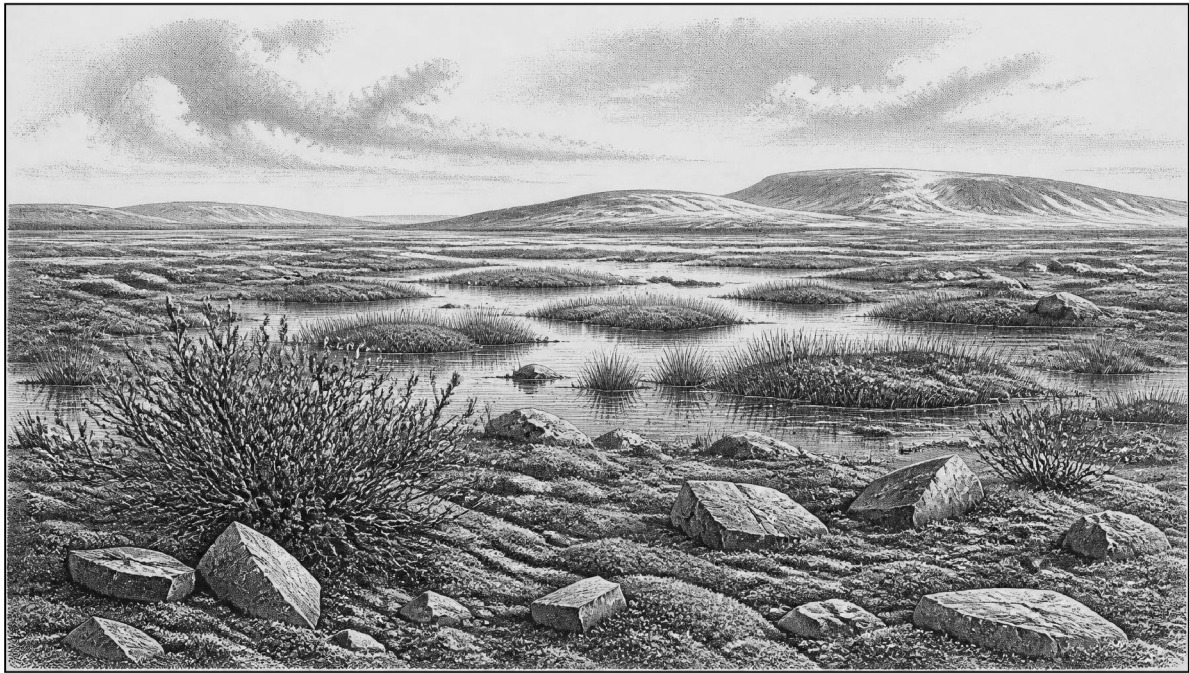
The animal and environmental evidence nevertheless permits a restrained picture of everyday ecological reality. Large herbivores would have moved through open country in search of forage; predators and scavengers followed them; caves and rock shelters could serve as refuges or dens. In the wetland basins of the north, plants, insects and aquatic organisms persisted in cold freshwater settings. In the south, limestone caves preserved remains from episodes otherwise almost erased from the landscape. These were dynamic habitats, shaped as much by ice, thaw, water and wind as by living creatures.

For Ireland, 31,018 BCE is thus best understood not as the year of a known human event but as a threshold within deep time. Ice was building towards a far more extensive cover; the animal record proves intermittent connections with broader European faunas; and Castlepook preserves a tantalising but unconfirmed possibility of human intervention. The central historical lesson is one of evidential discipline. Ireland's deep past is not empty, but it is fragmentary. Its surviving bones, sediments and landforms deserve to be read as traces of changing worlds, rather than forced into a calendar chronicle they cannot support.

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31017 BCE

Derryvree's Arctic Herbarium^[84]



31,017 BCE is a modern calendar label, not a year that can be recovered from the Irish archaeological record. No document, settlement layer, burial, hearth or named community can be placed in that precise year. At this depth in time, radiocarbon determinations carry wide uncertainties and must be calibrated; deposits may also represent accumulated material rather than a single moment. The most responsible approach is therefore to consider Ireland around 33,000 calendar years before AD 1950, within the later Pleistocene and Marine Isotope Stage 3, through broad calibrated ranges and securely dated sequences.

For this notional date, the crucial Irish evidence is environmental. It tells of an island at the north-western edge of Europe, exposed to abrupt climatic shifts and increasingly affected by the growth of the British–Irish Ice Sheet. It does not support conventional political history. There are no identifiable rulers, peoples, diplomatic relationships, wars, languages, religions, trading communities or systems of learning to describe. Nor is there secure evidence for a permanent human population in Ireland at this time. What survives instead is a fragile archive of silt, plant remains, animal bone, cave sediment and glacial landforms.

A Date Within a Wide Window

The nearest important chronological anchor is Derryvree, near Maguiresbridge in County Fermanagh. Road cutting through a drumlin in 1969 exposed a remarkable sequence: a lower layer of glacial till, freshwater silts and fine sands rich in organic remains, and then a second, later till. The order of these deposits demonstrates a local sequence of ice cover, an interval in which freshwater and wet ground developed, and renewed glaciation which sealed the evidence beneath the drumlin.

Organic material from the freshwater series produced a conventional radiocarbon result of 30,500 years before present, with an uncertainty of +1,170 and -1,030 years. Calibration does not translate this into a single calendar year. Rather, published treatment of the date places it broadly within a range of roughly 36,900–31,700 calibrated years before present. The modern label 31,017 BCE, approximately 32,966 years before AD 1950, lies within that wide probability range, but cannot be assigned to one particular plant, insect, season or episode at Derryvree.

This distinction matters. Derryvree does not prove that every part of Ireland was ice-free at once, nor does it provide a weather report for a chosen year. It does show that, during a broad middle-Midlandian interval before the Last Glacial Maximum, the Fermanagh locality supported an open freshwater and wetland environment between episodes of glaciation. The deposit is a powerful corrective to the simple image of an Ireland continuously buried beneath ice throughout the Ice Age.

Freshwater Beneath a Drumlin

The plants and small animals preserved in the Derryvree silts indicate severe, treeless conditions. Mosses, sedges, aquatic plants and arctic-alpine vegetation point to a tundra-like, periglacial landscape rather than woodland. Pools, marshy ground and shallow water lay amid open country exposed to cold, wind and seasonal freezing. The setting may be compared broadly with northern or upland environments today, but it was not a modern ecosystem displaced southwards intact. Its organisms formed a distinctive late-Pleistocene community responding to changing moisture, temperature, soils and glacial proximity.

Such evidence offers the closest available view of everyday environmental conditions in northern Ireland around this broad period. Watercourses and pools would have mattered because they concentrated vegetation and attracted animals. Sedges and mosses stabilised damp ground; submerged and floating plants occupied the water itself. Yet it would be misleading to turn this into an idyllic wetland scene. Periglacial terrain could be unstable, frost-shattered and sparsely vegetated. Seasonal thaw, snow cover and wind were likely decisive forces in the lives of plants and animals.

The later advance of ice is equally important. A glacier subsequently overrode the locality and deposited the upper till. This both destroyed earlier surfaces and preserved the freshwater sediments below. Ireland's Ice Age record is consequently selective: ice eroded many landscapes where people or animals might once have passed, while occasionally protecting small deposits beneath later sediment. Absence of a site is not proof that nothing happened there; it is often a consequence of an exceptionally destructive geological history.

Castlepook's Time-Averaged Fauna

For larger animals, the major archive lies far to the south-west at Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. Excavations undertaken in the early twentieth century recovered a remarkable collection of Pleistocene remains, now principally held by the National Museum of Ireland. Reassessment and improved radiocarbon pretreatment have shown that important elements of the assemblage are older than earlier dating suggested, placing them within Marine Isotope Stage 3, before the Last Glacial Maximum.

Animals represented in the wider Castlepook record include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena. This is compelling evidence that Ireland was periodically part of a wider north-west European faunal world. Reindeer, lemmings and

Arctic fox accord well with cold, open conditions. Mammoth and giant deer show that much larger herbivores could reach, and at least temporarily inhabit, Irish landscapes. Hyaena and wolf indicate predators and scavengers within the food web.

But the cave must not be mistaken for a single day's census. Its deposits accumulated across long periods and were altered by carnivores, water movement, collapse, sediment disturbance and antiquarian excavation. Bones from several episodes can become mixed. A mammoth bone, a hyaena skull and a reindeer element need not represent animals living beside one another, still less animals present in precisely 31,017 BCE. The sound conclusion is narrower and stronger: pre-maximum Ireland supported, or was repeatedly reached by, a varied cold-stage fauna over an extended period.

Recent sedimentary ancient-DNA work from Castlepook adds a promising, though still provisional, line of evidence. A 2026 preprint reports genetic traces of a dozen ancient animal taxa and interprets the results as showing links between Irish mammals and wider Eurasian populations before the Last Glacial Maximum. It supports faunal connectivity, but remains awaiting peer review and cannot establish an exact route, a permanently dry land bridge, or the date of any individual animal movement.

Changing Coasts and Advancing Ice

Sea level was lower than today because vast volumes of water were locked in global ice sheets. Ireland's coastline and the surrounding shelves were therefore different, and routes between Ireland, Britain and continental Europe changed repeatedly. The presence of large mammals demonstrates that dispersal was possible at some points in the late Pleistocene. It does not demonstrate one fixed, simple corridor. Movement may have depended on exposed shelves, changing sea passages, ice margins and short-lived favourable conditions. Animal movement also cannot be used automatically to infer easy human travel.

The nominal date falls before the fullest expansion of the last British–Irish Ice Sheet, whose overall maximum came later and whose different sectors did not advance or retreat in unison. Modern reconstructions show a complex, growing ice mass rather than a single uniform blanket spreading across Ireland on one date. At Derryvree, the inter-till freshwater series records a locally ice-free phase; elsewhere, ice, cold-based ice cover, exposed uplands, or rapidly shifting margins may have produced very different landscapes. Regional variation is fundamental to any reconstruction.

In the long view, the most consequential development was the approach of renewed glaciation. The world represented by Derryvree's wetland and Castlepook's fauna was vulnerable to intensifying cold, ice-sheet growth and the disruption of habitats and migration routes. Later glaciation transformed the physical map of Ireland, leaving drumlins, erratics, striated rock and altered drainage, while removing much of the evidence of landscapes that preceded it.

The Human Question

There is no securely excavated habitation site, tool assemblage, hearth, burial or continuous population in Ireland that can be assigned to this date. Accordingly, there is no evidential basis for reconstructing households, kin groups, authority, conflict, diplomacy, religious rites, art, teaching or organised exchange. Terms such as Gaelic, Celtic and Irish belong to incomparably later historical contexts and have no place in this Ice Age reconstruction. Farming, herding, pottery, metalworking, monuments and literacy were still many millennia in the future.

A potentially important but unresolved clue comes from Castlepook: a reindeer femur from an old collection has been reported as bearing a deep incision interpreted by Ruth Carden as a possible stone-tool butchery mark, on bone dated to broadly 33,000 years ago. If future analysis confirms both the mark's human origin and its archaeological significance, it may indicate a Palaeolithic visit and carcass processing in Ireland during a broadly comparable phase. It would not, by itself, demonstrate settlement, population size, social structure or cultural continuity. Fresh excavation at Castlepook has identified surviving Pleistocene deposits, but its 2022 work reported no cultural artefacts.

The secure evidence for human activity in Ireland is much later: a butchered brown-bear bone from Alice and Gwendoline Cave in County Clare is dated to about 12,810–12,590 calibrated years before present. That discovery proves that late Upper Palaeolithic people reached Ireland, but it comes more than twenty millennia after the period considered here. It cannot fill the enormous chronological gap around 31,017 BCE.

Ireland at this point is therefore best understood as a changing ecological frontier rather than a nation with a recoverable year-by-year history. Derrynvree's buried silts preserve a cold wetland between glacial episodes; Castlepook preserves fragments of a wider animal world and a debated human possibility. Together they show that the island was neither timeless nor uniformly frozen. They also set the limits of responsible knowledge: the evidence illuminates environments and animal connections across long ranges of time, while the precise year remains beyond reach.

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31016 BCE

BIRM-166's Reindeer World^[85]



“31,016 BCE” is a useful modern filing label, not a date that people in prehistoric Ireland could have named or recorded. At this depth in time there is no calendar-year history: no written testimony, no securely dated settlement surface, and no archaeological method capable of isolating a particular winter, hunt or generation. The responsible frame is therefore a broad one. This nominal year falls at roughly 33,000 calendar years before the radiocarbon convention of AD 1950, within the later part of Marine Isotope Stage 3, a variable phase of the last Ice Age known in Ireland as the Midlandian.

The most relevant evidence comes not from an event dated to this year, but from deposits with wide calibrated ranges. At Derryvree, near Maguiresbridge in County Fermanagh, roadworks exposed organic freshwater silts and fine sands sealed between two tills: unsorted sediments laid down by separate glacial advances. Organic material from the intervening layer produced a conventional radiocarbon determination of 30,500 years BP, with a substantial uncertainty. Modern calibration places the deposit broadly at about 36,900–31,700 calibrated years BP, or approximately 34,950–29,750 BCE. Thus 31,016 BCE lies within the span relevant to Derryvree, but cannot be pinpointed within it. The deposit records an environment that existed over time, not a diary entry for a single year.

Freshwater Between the Ice

Derryvree offers the clearest sequence for understanding Ireland around this broad horizon. First, ice deposited the lower till. Then an ice-free interval allowed water, fine sediment and organic matter to accumulate in a low-lying basin. Finally, another advance buried the freshwater deposits beneath upper

till. The order is secure even where the duration of each stage is not. It demonstrates that northern Ireland was not simply a timeless white expanse: glaciation, periglacial wetland and renewed glaciation succeeded one another as climate and ice margins changed.

The plants and insects preserved in the Derryvree sediments indicate open, treeless tundra or muskeg: wet, mossy ground with pools and sedge-rich margins, rather than forest or farmland. Fossils include freshwater mosses and sedges, while finds of bogbean, water-milfoil, mountain-avens, dwarf willow and other cold-tolerant plants point to a mosaic of shallow water, damp soil and sparse vegetation. Insects of northern aspect reinforce the interpretation of harsh conditions. This was a periglacial landscape, meaning one shaped by severe cold and frost without necessarily being permanently covered by glacier ice at that precise location.

That evidence supports a landscape with a strongly seasonal regime. Summer thaw could sustain ponds, plant growth and insect life; winter frost, snow and reduced daylight would have sharply restricted productivity. It does not establish exact temperatures for 31,016 BCE, nor prove that every part of Ireland had the same conditions. Local relief, drainage, distance from the sea and the changing position of ice all mattered. Yet it makes a wooded, temperate Ireland impossible for this period. The visual world was one of open ground, wet hollows, low vegetation and a climate capable of changing markedly over centuries or millennia.

Animals at Castlepook

The best-known animal evidence comes from Castlepook Cave, near Doneraile in north County Cork, long called Mammoth Cave because of its remarkable Pleistocene bone assemblage. The cave has produced remains attributed to woolly mammoth, reindeer, giant deer, spotted hyaena, wolf, bear, foxes, hares and lemmings. Together these animals belong to a cold-stage ecosystem unlike that of modern Ireland. Reindeer and lemmings, in particular, accord with the open, northern-looking habitats indicated at Derryvree; hyaenas and wolves show that large carcasses and mobile herbivores formed part of a wider predator-prey system.

Care is required, however. Cave deposits are rarely straightforward snapshots. Carnivores can drag bones underground; water can move them; later occupants can disturb them; and early excavations did not always record layers to modern standards. Some older radiocarbon measurements on Irish cave bone have been reassessed because techniques for removing contamination have improved. Castlepook is exceptionally important, but it is a cumulative bone archive, not an excavated camp floor. Its fauna demonstrates that cold-adapted mammals reached Ireland during this phase; it does not show that all these animals lived together at one moment or in one precisely defined landscape.

A reindeer femur from Castlepook has added a consequential but still limited human question. The bone has been reported as bearing a deep mark interpreted as consistent with chopping or butchery by a stone tool, and has been publicised as evidence for human activity around 33,000 years ago. If that interpretation is sustained through continued specialist study, it would represent a very early Upper Palaeolithic human presence in Ireland. It would not demonstrate a permanent population, a village, a named group or continuous occupation. Nor can it establish that the reindeer was killed in the cave: people may have processed part of an animal elsewhere and carried or lost the bone in the cave system.

People: A Possibility, Not a Polity

There is no evidence for political institutions, rulers, diplomacy, territorial states or warfare in Ireland at this time. Such categories belong to much later history and should not be projected onto a Late Pleistocene landscape. If people were present, the most defensible model is of small, highly mobile foraging parties moving through the wider north-west European world in pursuit of animals, raw materials and seasonal opportunities. Ireland's position at the Atlantic edge, alongside lower sea levels and changing ice conditions, would have made routes and access variable. It cannot safely be assumed that a permanent land bridge existed at this particular moment, or that crossing was easy.

The possible marked femur implies, at most, an episode of animal processing. Reindeer could supply meat, marrow, hides, sinew, bone and antler, but the bone alone cannot tell which resources were taken or whether a party remained for days, weeks or a season. No securely associated stone-tool assemblage, hearth, dwelling, burial, artwork or repeated occupation horizon has yet been demonstrated for this date in Ireland. The distinction matters. Upper Palaeolithic communities elsewhere in Europe made sophisticated stone tools, ornaments, images and social networks, but continental and British evidence is context, not proof that the same activities occurred on Irish ground.

Accordingly, society and everyday life can only be described conditionally. A visitor able to hunt reindeer would have needed portable clothing, practical knowledge of weather and terrain, and social co-operation sufficient to travel and share risk. These are reasonable inferences from the demands of cold-climate foraging, not directly observed Irish facts. There is no basis for reconstructing language, kinship rules, ritual, leadership, trade partnerships or beliefs. Religion and learning leave no identifiable trace in the surviving Irish evidence of this age.

Economy Without Markets

There was no agricultural economy. Fields, livestock, cereal cultivation, pottery, metalwork and permanent settlement lay far in the future. The local economy, if human groups entered Ireland, was one of direct use of living landscapes: hunting, scavenging where safe, gathering seasonal plant foods and exploiting animal materials. The potential importance of large herbivores is clear, but it must not obscure the precariousness of the setting. A cold, open terrain could offer grazing and visibility, yet food supply varied greatly across seasons and severe weather could make movement dangerous.

There is likewise no direct evidence for trade within Ireland. Stone, animal products and people may have moved across wider landscapes, but no trace allows a network to be mapped for this particular period. The absence of proof is especially unsurprising because later ice advances eroded, reworked and buried many older surfaces. What survives is biased towards caves, protected sediment lenses and chance exposures such as the Derryvree road cutting. Much of the evidence that might once have revealed camps, tracks or tool-making places has probably been destroyed or remains undiscovered beneath glacial deposits, peat or the sea.

An Island in Formation

Ireland's regional geography was also changing. The last British-Irish Ice Sheet had not yet reached its best-established maximum extent, generally dated later, around 26,000–19,000 years ago, although ice growth and retreat were not synchronous everywhere. Research on the ice sheet shows that advance began

and peaked at different times in different sectors. Around the broad period represented by Derryvree and the older Castlepook fauna, conditions could shift between locally ice-free terrain, advancing ice margins and landscapes affected by frozen ground and meltwater.

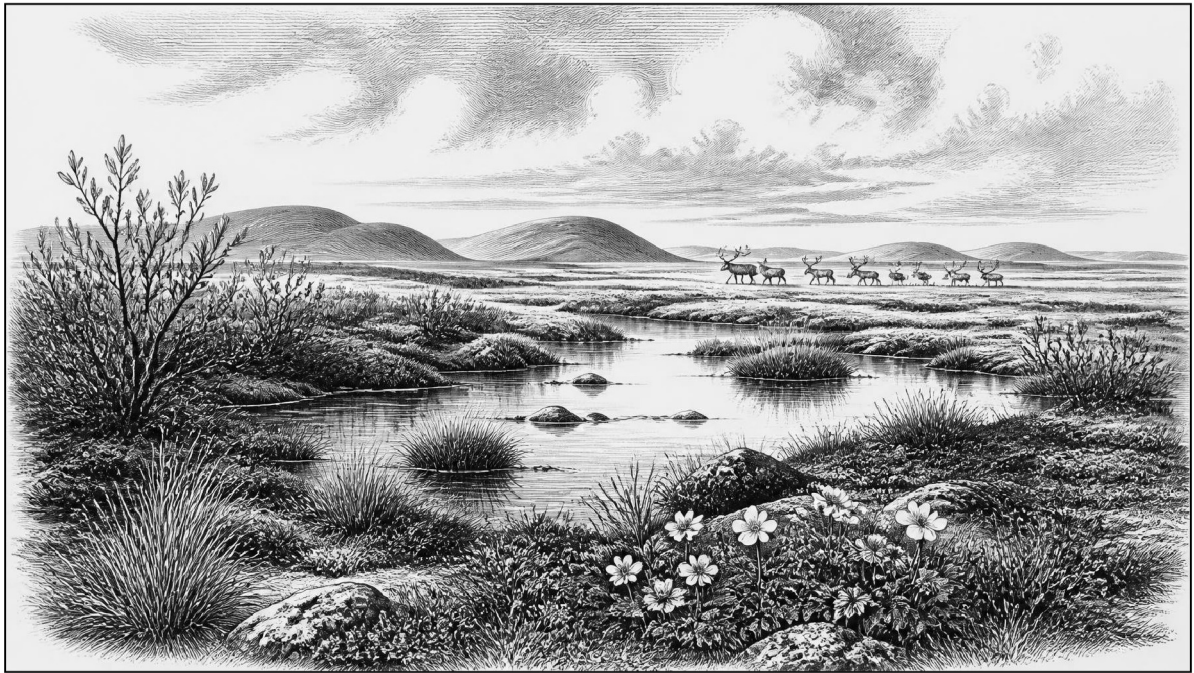
Speleothems in Crag Cave, County Kerry, provide a complementary climatic perspective. Their episodic growth during parts of the last glacial period required liquid water moving through the cave and therefore conditions less persistently frozen than during full glaciation. They do not describe Derryvree or Castlepook directly, but they underline an important point: Irish Ice Age climates were dynamic. A long cold stage included abrupt fluctuations and regional contrasts, rather than one unchanging era of ice.

For 31,016 BCE, then, Ireland's history is environmental before it is political. The securely observed record is a freshwater tundra basin in Fermanagh, animal remains in a Cork cave, and the stratigraphic evidence of glaciers that advanced before and after locally open conditions. The possible human trace at Castlepook is important precisely because it is so slight: one marked reindeer bone may hint at an ephemeral encounter between people and an Ice Age landscape. It cannot yet bear the weight of a settled national origin story. The honest history of this date is one of sediments, bones, wet ground and uncertainty—evidence sufficiently rich to imagine a real world, but not to invent a year-by-year past.

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31015 BCE

Derryvree's Brief Green Interval^[86]



The label 31,015 BCE is a modern device, not a date that can be attached to a recorded Irish event. No people in Ireland kept calendars, wrote texts or left a year-by-year archaeological sequence at this depth of time. In radiocarbon terms it falls roughly 33,000 calendar years before AD 1950, within the later part of Marine Isotope Stage 3, a climatically volatile phase of the last Ice Age. Even that conversion must be treated cautiously: radiocarbon ages require calibration, and uncertainty at this distance commonly amounts to centuries or millennia. The responsible question is therefore not what happened in one numbered year, but what the fragmentary environmental and faunal evidence can say about Ireland during the broad interval around it.

A Landscape Between Ice Advances

The most informative Irish evidence comes from Derryvree, near Maguiresbridge in County Fermanagh. Road construction in 1969 cut through a drumlin and exposed an exceptional sequence: freshwater silts and fine sands rich in organic material lay between two thick deposits of till, the stony sediment left directly by glacier ice. This is not a historical narrative, but its order is clear. An earlier glacial episode had affected the locality; later, conditions allowed water, sediment, plants and insects to accumulate; afterwards, renewed ice covered and preserved the deposit beneath a second till.

The organic material produced a conventional radiocarbon age of about 30,500 BP, with a large error range. Published calibrated treatments place the Derryvree freshwater episode broadly within c. 36,900–31,700 cal BP. The modern date 31,015 BCE, approximately 32,965 cal BP, falls inside that broad span. It would be wrong, however, to identify a particular plant, pond-edge or animal bone as belonging to that individual year. Derryvree illuminates the environmental possibilities of the period, not a dated annual scene.

Its chief significance is that northern Ireland was not simply a blank space under permanent ice. At least at Derryvree, for an interval within the Middle Midlandian cold stage, there was an ice-free freshwater setting. The site is often described as a cold, open muskeg or wetland landscape rather than a temperate woodland. Mosses, sedges and other wet-ground plants, together with aquatic indicators, point to shallow pools, marshy ground and changing water levels. Mountain-avens, dwarf willow, Arctic-alpine herbs and clubmoss-like plants belong to a vegetation mosaic adapted to cold, exposed conditions. Local shelter, soil moisture and season mattered: a low basin could sustain wetland life even while the wider climate remained harsh.

Cold Country, Not a Frozen Uniformity

The Ireland of this interval should not be imagined as either today's green, wooded island or an unbroken white glacier. It was a changing periglacial world, with ground subject to frost, sparse vegetation and strong seasonality. The large ice sheet that later covered most of Ireland had not yet reached its fullest extent. Modern reconstructions of the British–Irish Ice Sheet concentrate on the period from 31,000 years BP onward and show rapid growth towards a maximum around 23,000 BP; the precise distribution of ice in Ireland before that reconstruction begins is less securely resolved. Derryvree is therefore particularly valuable, because it preserves direct local evidence of a non-glacial interval rather than relying solely on ice-sheet modelling.

Low global sea levels altered the geography beyond Ireland. The continental shelves were more exposed than now, reducing sea crossings and enlarging the area of coastal plain, although Ireland's exact connections and barriers varied with topography, sea level and advancing ice. This made animal dispersal from Britain and continental Europe possible at some stages, but it does not demonstrate a fixed land bridge, a settled route or regular human traffic at 31,015 BCE. In such a mobile climatic system, shorelines, river courses, grazing grounds and ice margins could shift on timescales far shorter than archaeological chronology can distinguish.

Animals in the Cave Record

County Cork provides the principal faunal counterpoint to Fermanagh's wetland deposits. Castlepook Cave, also known as Mammoth Cave or Doneraile Cave, lies in the Awbeg valley near Doneraile. Antiquarian excavations there recovered an unusually rich collection of Late Pleistocene animal remains. Reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, mountain hare, lemmings and spotted hyaena are among the species represented in the broader cave record. Together they establish that Ireland was repeatedly reached by animals associated with cold, open habitats during the last glacial cycle.

Yet the cave assemblage must not be converted into a single imagined herd wandering through Cork in 31,015 BCE. Much of the collection was excavated before modern stratigraphic methods, while cave deposits can be disturbed by carnivores, water, collapse and later digging. Modern reassessment and radiocarbon dating have shown that the Castlepook material includes animals of different ages, including specimens from Marine Isotope Stage 3 and others much later. It is evidence for recurring animal presence in a changing landscape, not a census of one moment.

Even so, the combination of Derryvree's cold wetland and Castlepook's fauna supports a careful reconstruction of regional ecological diversity. Reindeer could exploit open grazing, while hare, fox and lemmings occupied smaller ecological niches. Predators and scavengers, especially hyaenas, indicate food

webs with substantial prey and access to carcasses. Mammoth and giant-deer remains are reminders that Ireland's Pleistocene fauna was far more varied than its later historic fauna. Their presence also tells us nothing certain about abundance: a bone preserved in limestone cave is a survivor of geological chance as much as a measure of population size.

The Human Question

There is no securely excavated settlement, hearth, stone-tool assemblage or human burial in Ireland that can be assigned to this period. Consequently, there is no basis for describing clans, leaders, political authority, warfare, diplomacy, language, ritual, art or learning in Ireland around 31,015 BCE. Nor can trade be demonstrated. An imported object, a repeated exchange route or a permanent community would leave forms of evidence not presently known from this island at this date.

One find nevertheless makes the question important. A reindeer femur from Castlepook has been reported as dated to about 33,000 years ago and as bearing a deep mark interpreted as possible cutting or chopping of fresh bone with a sharp stone edge. If that interpretation is ultimately sustained by full contextual and microscopic study, it may represent human processing of a carcass and could push evidence for human activity in Ireland dramatically earlier than the better-established terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare, dated to roughly 12,800–12,600 cal BP.

For now, the wording matters. The bone is evidence of a reindeer; its reported modification is evidence under evaluation, not proof of a resident population. The find was recovered from a historically disturbed cave collection rather than a newly excavated occupation surface. It cannot establish whether one or more people made a brief visit, whether they hunted or scavenged, how they travelled, or whether they returned. The most that can responsibly be said is that short-lived human presence is a serious possibility requiring further archaeological testing. Absence of known sites is not proof that people never reached Ireland, especially when later ice could erode or bury traces; it is, however, decisive against presenting a populated Irish society as fact.

No Kingdoms, but an Ecological History

Political history begins here with a necessary silence. There were no known Irish polities, borders, diplomatic contacts or conflicts that scholarship can identify. Religion and culture are likewise beyond the evidence: no shrine, burial rite, carved object, cave art or ceremonial landscape from Ireland can be tied to this horizon. Everyday life is directly visible only for non-human communities—animals seeking forage, predators using caves, plants colonising wet ground and glaciers repeatedly reshaping the terrain.

That silence is itself historically meaningful. Ireland's later archaeological record is rich precisely because people eventually left houses, monuments, tools, graves and fields. Around 31,015 BCE, the island's story is instead reconstructed from pollen, seeds, beetles, mosses, bones, cave sediments, till and the calibrated ages assigned to them. The evidence portrays an exposed, cold and unstable country, but not a lifeless one: freshwater persisted locally between ice advances, cold-adapted plants found footholds, and large mammals crossed or recolonised an altered north-west European landscape. Whether people briefly entered that world remains an important, unresolved question rather than an established chapter of settlement history.

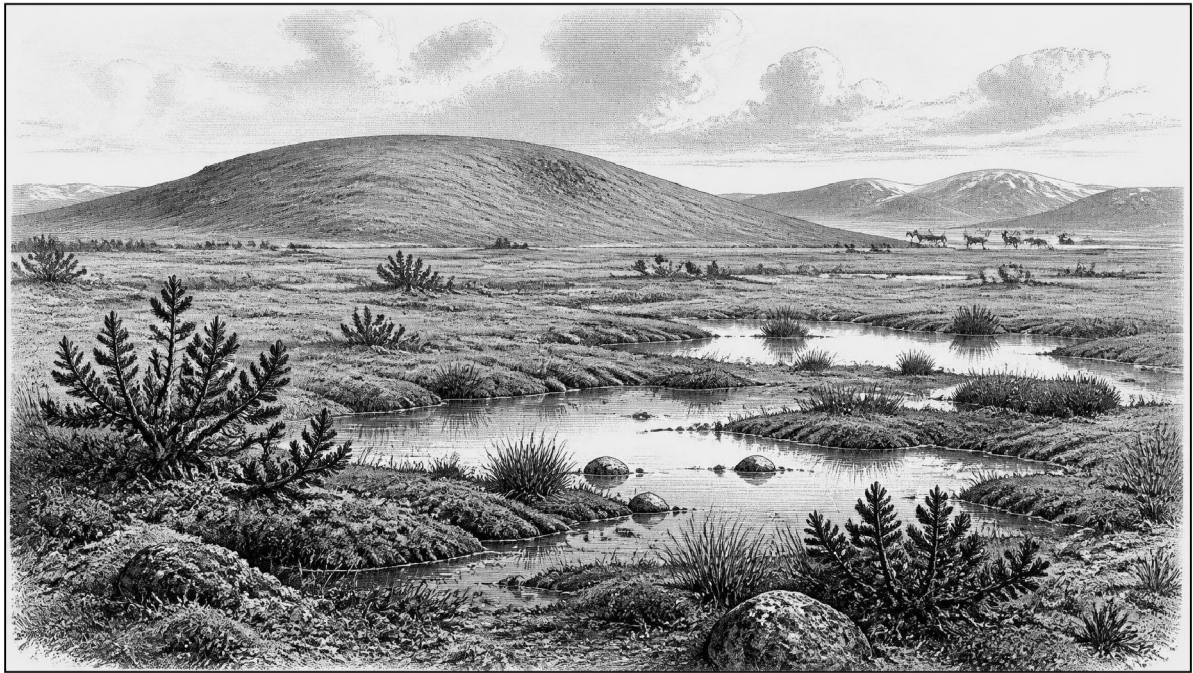
The appropriate history of Ireland at this date is therefore one of environmental opportunity and constraint. Derryvree records an interval when water and vegetation interrupted the glacial sequence; Castlepook preserves the traces of animals that could use such landscapes; later ice both transformed the

island and destroyed much of what might once have survived. Modern research can narrow the setting to calibrated ranges and test individual bones with new methods. It cannot recover a calendar-year event for 31,015 BCE—and it should not pretend otherwise.

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31014 BCE

Derryvree's Sedgebound Drumlin^[87]



31,014 BCE is not a date at which Ireland can be narrated year by year. It is a modern calendar label imposed on a world without written records, rulers' lists, settlements securely dated to a season, or any recoverable indigenous calendar. In archaeological terms it lies roughly 33,000 calibrated years before present (cal BP, conventionally counted back from AD 1950), in the Late Pleistocene and within Marine Isotope Stage 3. The responsible history of Ireland at this point is therefore not a story of named people or events. It is a carefully bounded account of cold-climate environments, animal movement, changing ice and the very limited possibility of human presence.

A Date Within Broad Ranges

Even this chronological placing needs caution. A radiocarbon determination is not itself a calendar date: atmospheric carbon levels altered through time, so laboratory ages must be calibrated and are normally expressed as probability ranges. At this depth of time those ranges are wide. The central Irish environmental reference is Derryvree, near Maguiresbridge in County Fermanagh. Organic sediments there produced a conventional radiocarbon age of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Later modelling of the wider western British–Irish Ice Sheet record treats Derryvree as evidence for pre-Last Glacial Maximum ice-free conditions around 35.1 $\pm$ 3.2 thousand years ago. Such figures make the deposit relevant to about 31,014 BCE, but they do not demonstrate that every feature in it existed in that particular numbered year.

The older Irish terms “Middle Midlandian” and “Derryvree Cold Phase” remain useful regional labels, provided they are not mistaken for sharply bounded historical periods. Ireland's climate and ice cover changed repeatedly during Marine Isotope Stage 3. Conditions could differ substantially over

relatively short intervals, and the surviving sites are scattered, incomplete and often difficult to correlate. The evidence supports a cold, largely treeless Irish landscape in places; it does not permit a map of the whole island for one precise year.

Freshwater Beneath the Ice Debris

Derryvree is exceptional because roadworks in 1969 cut through a drumlin and exposed a sequence that later ice had not entirely erased. A lower till — stony sediment laid down by glacier ice — was separated from an upper till by freshwater silts, fine sands and organic-rich layers. The order matters. It proves that after one episode of local glaciation and before another, water accumulated long enough for sediments, plants and insects to build up. The deposit was subsequently sealed beneath renewed ice-derived material.

Its fossil content provides the clearest local picture available for this broad interval. Freshwater mosses and sedges, together with insects of cold northern affinities, indicate wet ground and shallow water under severe conditions. Earlier analysis also identified a mixture of grasses, sedges, herbs and juniper, commonly described as an open, treeless muskeg or tundra-like wetland. That language should not conjure a uniform polar desert. Rather, Derryvree suggests a patchwork of sedgy margins, mossy ground, small pools, fine mineral sediment and sparsely vegetated terrain. Summers may have allowed a brief productive season; winters were evidently much harsher than those of modern Ireland.

The Derryvree record gains strength when set beside other northern Irish inter-till deposits. At Hollymount, also near Maguiresbridge, and at Greenagho near Belcoo, organic muds and peat preserve signs of cold, open country between glacial episodes. Their dates and correlations are not equally secure, and they cannot simply be merged into one simultaneous landscape. Nevertheless, together they show that the northern part of the island was not a permanently featureless ice sheet throughout the entire Middle Midlandian. Local ice-free or non-glacial intervals existed, though their timing, extent and duration remain debated.

Animals at Castlepook

County Cork supplies another, very different archive: Castlepook Cave near Doneraile, historically known as Mammoth Cave. Excavated in the early twentieth century, it yielded a remarkable assemblage of Late Pleistocene animal remains. Mammoth and spotted hyena bones previously returned radiocarbon ages in the region of 35,000–34,000 BP, placing at least part of the fauna broadly within the same cold-stage world as Derryvree. Research on the wider collection has also identified remains attributed to reindeer, giant deer, brown bear, wolf, fox or Arctic fox, hare, stoat and lemmings. Not every species need have lived there at the same time; a cave assemblage can collect remains over many millennia through carnivore activity, natural deaths, water movement and excavation disturbance.

What can be stated confidently is that suitable habitats existed somewhere in or near Ireland for a varied cold-climate fauna during portions of this period. Reindeer imply open grazing country; mammoth and giant deer point to substantial herbivore biomass in favourable zones; hyenas and wolves show that predators followed or occupied those landscapes. The cave itself should not be imagined as a human village. It was a natural cavity used and entered in different ways over a long span, and the early excavations did not provide the kind of fine-grained stratigraphic record expected today.

A reindeer femur from Castlepook has been publicly reported as approximately 33,000 years old and as bearing a deep mark interpreted as possible stone-tool damage from butchery. If that interpretation is confirmed by full specialist publication and contextual analysis, it would be important evidence for a human visit to Ireland far earlier than the established post-glacial settlement record. It is not, however, evidence for a resident population, a camp, a hearth, a tool-making site or a continuous occupation. No securely associated stone-tool assemblage, dwelling floor, burial or repeated activity area has been demonstrated for Ireland at this horizon. The distinction between a possible carcass-processing episode and a settled society is crucial.

People: Possibility, Not Population

It is reasonable to ask whether hunter-gatherers could have reached Ireland around this time. In neighbouring parts of north-west Europe, Upper Palaeolithic people possessed stone technologies, controlled fire, made fitted clothing and moved across demanding seasonal landscapes. Mobile groups could follow game, exploit short-lived opportunities and leave very little behind. Lower sea levels also meant that the outlines of coasts, estuaries and shallow seas were unlike those of today. Yet lower sea level did not automatically create a simple, dry land route to every part of Ireland. Ice margins, rivers, wetlands, exposed shelf terrain and stretches of water changed through time, while the precise configuration at 33,000 cal BP is uncertain.

Consequently, a cautious interpretation is stronger than a dramatic one. Ireland may have been visited intermittently by small groups during favourable windows, perhaps in association with animal movements; it may equally be that much evidence has been destroyed by later glaciation or remains undiscovered. The material presently available cannot identify a community's size, language, ancestry, seasonal round or social organisation. It cannot establish hunting territories, kinship networks or exchange partnerships. "Trade" is especially inappropriate as a claim: there are no Irish objects of this date whose source, transport and social context demonstrate an exchange system.

There were likewise no identifiable political affairs, diplomacy or warfare in the historical sense. No chieftdom, state, boundary, treaty or named conflict can be recovered from the record. Predation and competition among animals were real features of the landscape, but that is not evidence of human conflict. If people were present, decisions about movement, shelter, fuel, clothing and access to carcasses would have been matters of immediate survival rather than institutions visible to archaeology. The absence of proof is not proof that humans were absent; equally, it is not permission to invent an Ice Age Irish society.

Culture Beyond Recovery

Religion, art, music, storytelling and learning cannot be described specifically for Ireland in 31,014 BCE. Upper Palaeolithic communities elsewhere in Europe made images, ornaments and other objects with social or symbolic importance, but no comparable Irish evidence belongs securely to this date. It would be unsound to transfer continental cave art, burial customs or ceremonial practices directly across the sea. The most that can be said is that any visiting humans would have brought knowledge and social traditions with them; none has yet been recovered from an Irish context of this age.

The same restraint applies to everyday life. Derryvree's wetland tells us much about habitat but nothing directly about food preparation or households. Castlepook's fauna can show animals reached the region, but cannot establish who hunted which species, whether they were eaten by people, or how long

anyone stayed. The potential cut-marked reindeer bone is therefore important precisely because it is so limited: one modified object, if securely verified, can change the question archaeologists ask without answering all the larger questions.

Ice, Erosion and Historical Silence

The long-term setting explains why the evidence is so fragmentary. The British–Irish Ice Sheet was growing and changing during the millennia after this notional date. Research places the major Last Glacial Maximum expansion later, with ice reaching its greatest extent across Ireland and its continental shelf roughly 27,000–23,000 cal BP. Advancing ice eroded bedrock and older sediments, transported material, redeposited till and reshaped drainage. Much of any earlier archaeological landscape would have been scoured away, buried or mixed beyond recognition.

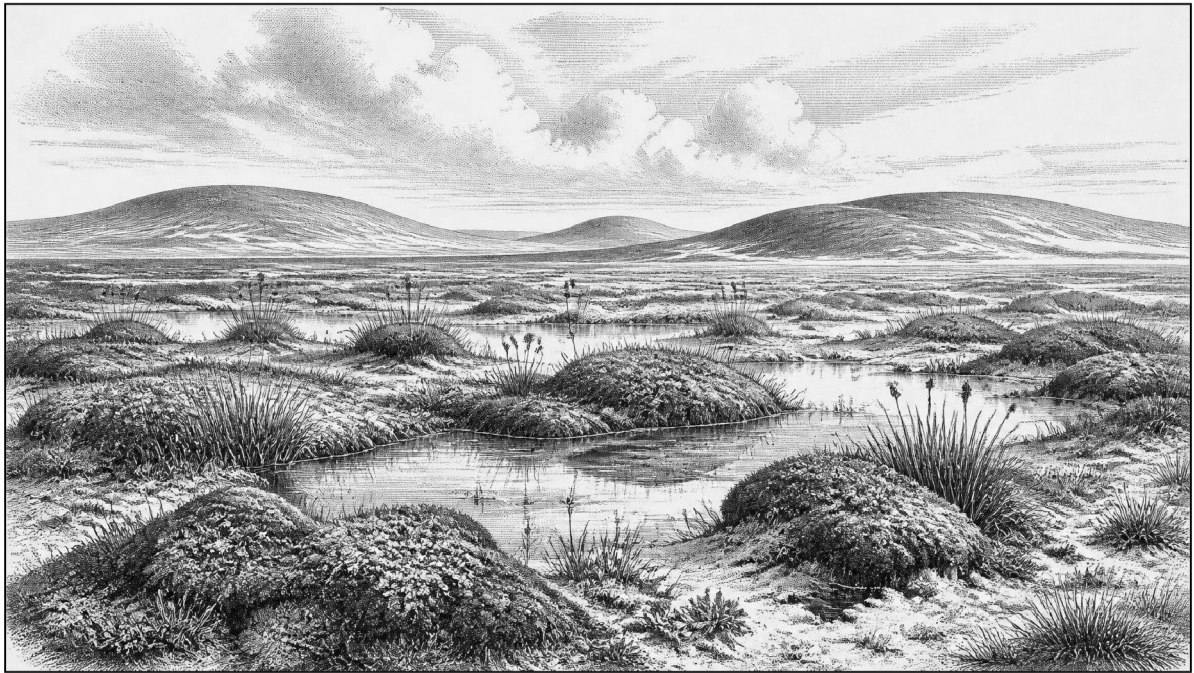
This later glaciation also means that no straightforward line joins a possible visit around 33,000 cal BP with the much later re-peopling of post-glacial Ireland. The island's securely evidenced Mesolithic communities belong to a wholly different environmental world after the ice had retreated and woodland had developed. Around 31,014 BCE, the principal Irish story is instead one of ecological opportunity amid instability: cold wetlands in Fermanagh, large mammals and predators in Cork, uncertain routes across a changing north-west European margin, and an archaeological record reduced to rare survivals.

That is not an empty history. It is a history written in silts beneath a drumlin, bones in a limestone cave, insect remains, pollen and the sequence of ice-laid deposits. Its central lesson is methodological as well as historical: Ireland at this date can be illuminated, but only through broad calibrated ranges, closely observed material evidence and a clear separation between what survives, what it suggests and what remains unknown.

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31013 BCE

Derryvree's Periglacial Poolscape^[88]



The label 31,013 BCE is a modern way of locating a point in very deep time, not a year that can be recovered from an Irish record. There were no written calendars, named rulers or datable events on the island. In archaeological terms, it lies roughly 33,000 calendar years before AD 1950, within the Late Pleistocene, the Midlandian cold stage in Ireland and the climatically erratic Marine Isotope Stage 3 (MIS 3). Evidence can illuminate broad spans of centuries or millennia around it; it cannot responsibly distinguish what happened in this particular calendar year.

The most useful Irish evidence comes not from a settlement but from sediments, caves, animal remains and the landforms made or later reshaped by ice. Around this notional date, Ireland was part of a changing north-west European cold-world. It was moving towards the major expansion of the last British-Irish Ice Sheet, but it should not automatically be pictured as a single, uniformly ice-covered island. Local ice margins shifted, and the surviving evidence is too discontinuous to map the island's exact condition in 31,013 BCE. What can be said is that parts of Ireland had supported freshwater, tundra-like vegetation and Pleistocene animals during the relevant broad interval, before later glaciation buried, reworked or destroyed much of that record.

A Date Without an Annal

Scientific dating is essential but has limits. Radiocarbon ages are conventionally measured before AD 1950 and must be calibrated to account for past variations in atmospheric carbon. At ages of around 30,000 radiocarbon years and beyond, calibrated results commonly cover substantial ranges rather than a single year. Sediments may also build up over time, while bones date the death of an animal rather than every later process affecting the specimen. Consequently, a modern BCE number is useful for filing this article, but it is not a chronological pin driven into an ancient Irish event.

The closest important environmental anchor is Derryvree, near Maguiresbridge in County Fermanagh. Road works in 1969 exposed a drumlin section in which organic silts and fine sands lay between deposits of glacial till. The freshwater sediments produced a radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 BP. Published calibrations place the broad age of this evidence at approximately 36,900–31,700 calibrated years BP. That wide range encompasses the chronological neighbourhood of 31,013 BCE, but does not prove that the entire deposit formed then. Its value lies in showing that, during an ice-free interval later sealed beneath renewed glacial deposits, freshwater habitats and cold-adapted vegetation existed in south Fermanagh.

Derryvree's Open Wetlands

The Derryvree fossils offer the clearest local picture of the landscape. Pollen, plant macrofossils, mosses and insects indicate an open, largely treeless environment, often described as tundra or muskeg-like ground. Sedges and grasses were important; mosses flourished in wet places; herbs and low shrubs occurred in the wider vegetation. Shallow pools and waterlogged ground lay amid exposed mineral surfaces shaped by frost. The evidence does not support forest, farmland or a settled countryside. It instead suggests a sparse, seasonal landscape in which cold winters and periglacial processes were major ecological forces.

That scene should not be treated as an unchanging national landscape. Derryvree is one locality, and pollen can travel beyond its immediate source. Some grains may have been reworked from older deposits. Nevertheless, its combined plant and insect evidence is unusually valuable because independent forms of evidence point in the same direction: cold conditions, little tree cover, wet ground in places and open country elsewhere. It establishes that Ireland's Late Pleistocene environments could be more varied than the shorthand image of an island wholly entombed beneath ice.

Across the North Atlantic region, MIS 3 was marked by abrupt climatic oscillations. Greenland ice cores document repeated swings between relatively milder interstadials and severe stadials. Irish deposits preserve local results of those changes but are rarely dated precisely enough to assign them confidently to a named Greenland event. The responsible conclusion is therefore modest: the surroundings of 31,013 BCE were cold, unstable and increasingly vulnerable to glaciation, rather than permanently uniform.

Animals in a Changing Island

Caves in the limestone country of north County Cork provide another fragmentary archive. Castlepook Cave, near Doneraile, has yielded a remarkable Late Pleistocene faunal collection, including remains attributed to reindeer, giant deer, brown bear, wolf or fox, hare, Norwegian lemming, woolly mammoth and spotted hyaena. The list is striking because it links Ireland with wider cold-stage faunas of Britain and continental Europe. It demonstrates that large herbivores and predators reached the island during favourable parts of the Late Pleistocene.

Yet the cave must not be made to tell more than it can. Its deposits were affected by carnivores, water movement, older excavations and later disturbance. Bones of different ages may have been mixed, and a species list does not prove that every animal lived together in the same valley, season or decade. The remains are best understood as a time-averaged record of changing animal communities rather than a snapshot of a single hunt or a complete food web in 31,013 BCE.

For people, these animals would have represented potential food, hides, bone and danger. But that sentence is an inference from hunter-gatherer lifeways elsewhere, not direct evidence of an Irish community. No securely dated camp, hearth, stone-tool assemblage, dwelling floor, burial or repeated occupation surface of this age has been published from Ireland. In consequence, there is no basis for describing families, social ranks, language, territories or a permanent Palaeolithic population on the island.

The Castlepook Reindeer Question

The principal possible human trace is a reindeer femur from Castlepook reported as approximately 33,000 years old and bearing a deep linear mark interpreted by palaeozoologist Ruth Carden as a stone-tool cut or chop made during butchery. If the modification is confirmed as human-made and contemporary with the animal's death, it would be significant evidence that a person or small group handled a reindeer in Ireland during MIS 3. It would push possible human activity far earlier than Ireland's better-established post-glacial settlement record.

The conditional wording matters. One modified bone does not demonstrate a settlement, a population, a migration route or a continuous occupation. A radiocarbon age for the bone dates the animal's death, not necessarily the marking episode; the cave context is complex; and no associated tools or hearth have yet converted this intriguing object into a documented habitation site. The evidence may record a brief hunting or scavenging visit, but it cannot identify who came, from where, how often or whether they remained.

Nor can lower sea level alone settle the question of access. With much global water held in ice, coastlines and continental shelves differed greatly from those of today. Ireland's separation from Britain may have been narrower or its routes different at various times, but lowered seas do not automatically prove a continuous dry crossing. Animals and any humans could have moved by changing combinations of exposed terrain, short crossings or seasonal routes. The precise geography remains an active research question.

No Politics, No Proven Ritual

Political affairs, diplomacy and organised warfare are beyond the reach of the evidence. There are no named groups, fortifications, weapons caches or territorial monuments from Ireland at this horizon. It would be misleading to project later Gaelic kingdoms, Celtic identities or even the well-attested Mesolithic societies of millennia afterwards into this Ice Age landscape. If humans did visit, they belonged to mobile Upper Palaeolithic worlds known elsewhere in Europe; Ireland itself has not yielded enough securely contextual material to assign a local tool tradition or social identity.

The same restraint applies to religion, art and learning. Caves can invite speculation about ritual, but Castlepook's known Pleistocene remains are chiefly faunal and geological evidence. No Irish cave art, figurine, grave, shrine, musical instrument or symbolic object can be securely placed around this date. The absence may partly reflect later ice erosion, acidic soils, sea-level change and the limited survival of excavation contexts. It is still an absence in the present record, not permission to invent an unseen tradition.

Economy, if a human presence is ultimately established, can only be discussed at the smallest scale: possible processing of a reindeer carcass. There is no evidence for agriculture, herding, craft specialisation, long-distance exchange or regular trade on the island. The dominant economic processes

visible archaeologically were ecological: plants colonising exposed ground, herbivores exploiting open vegetation, predators following prey, and ice repeatedly remaking the terrain.

Ice, Loss and Historical Perspective

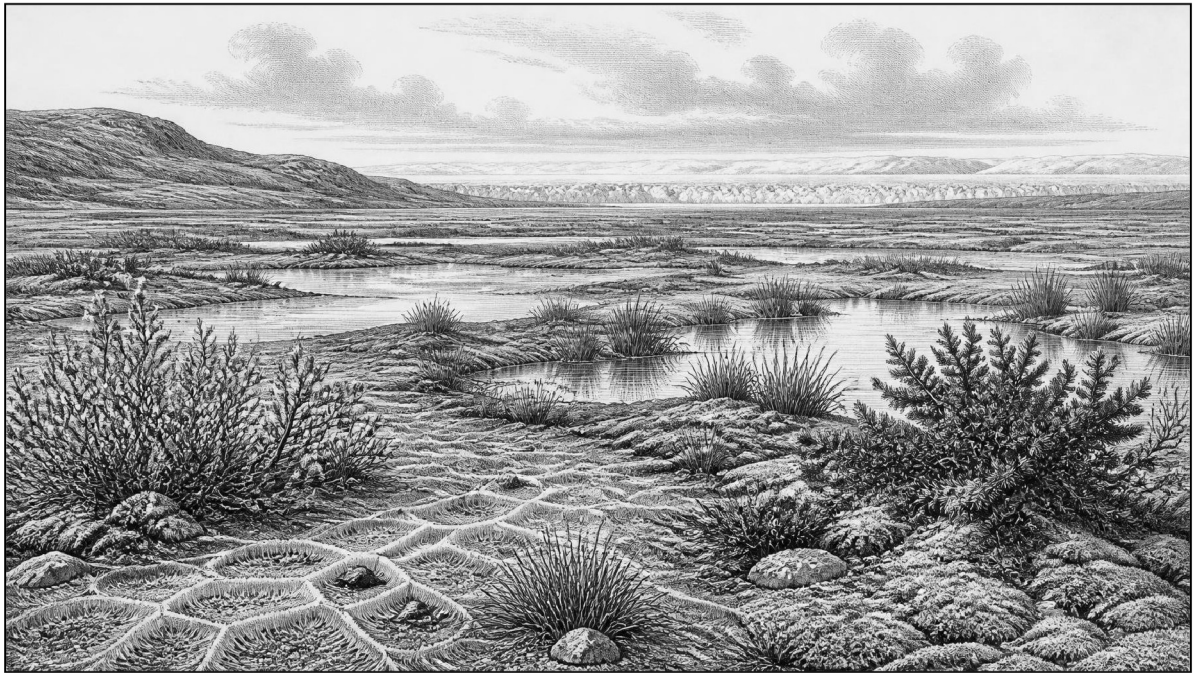
Within several millennia, the last British–Irish Ice Sheet expanded dramatically towards its later maximum. Glacial erosion and deposition moulded drumlins, stripped surfaces, diverted drainage and concealed older deposits beneath till. This helps explain why Ireland’s record for the time is so sparse. The scarcity of early sites is not proof that no person ever arrived; equally, it cannot be used as proof of a substantial vanished population. Archaeology must preserve both possibilities while treating the evidence in proportion to its strength.

The chief development around 31,013 BCE was therefore environmental, not political: an unstable cold-stage Ireland of open wetlands, sparse tundra vegetation, mobile Pleistocene fauna and growing ice. Derryvree’s buried freshwater deposits show that life persisted in ice-free pockets; Castlepook’s bones show connections with the wider Ice Age fauna of north-west Europe; the marked reindeer femur poses, but does not yet settle, the question of human activity. That is a thin record, but it is a real one—and its uncertainty is part of the history.

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31012 BCE

Maguirebridge Beneath Advancing Ice^[89]



31,012 BCE is not a date that can be treated as a recorded Irish year. No people on the island left writing, calendars, named polities or dated monuments from this depth of time. The number is a modern chronological label. Measured against the archaeological convention in which “present” is AD 1950, it falls roughly 32,960 calendar years before present, in the later part of the Last Glacial Period and within Marine Isotope Stage 3. Scientific evidence can illuminate broad intervals, sometimes several millennia long; it cannot identify a particular winter, journey, hunt or political event in Ireland in this nominal year.

A Date Within Wide Ranges

The closest important Irish chronological anchor is the Derryvree deposit near Maguiresbridge, County Fermanagh. Organic freshwater sediments there produced a radiocarbon determination of about 30,500 radiocarbon years before present, with a large uncertainty. When calibrated against changing past concentrations of atmospheric carbon-14, this has been placed broadly at about 36,900–31,700 calibrated years before present. The modern label 31,012 BCE lies within that broad range. It does not follow that every plant, insect or pool represented in the deposit existed in that exact year, nor that conditions at Derryvree applied unchanged across all of Ireland.

This distinction is fundamental. Radiocarbon dating measures the age of once-living material, not a calendar entry; calibration converts that measurement into a probability range rather than a pinpoint. At more than 30,000 years’ distance, the interval is necessarily wide. The responsible subject is therefore Ireland during a cold, unstable Late Pleistocene phase, not an invented episode of national history.

The Derryvree Sequence

Derryvree is valuable because later glaciers buried its evidence rather than completely destroying it. Roadworks exposed fine sands and organic silts enclosed between two tills: unsorted material deposited by glacier ice. The lower till shows that ice had previously occupied the locality. Above it, water accumulated and plants, insects and other organic remains entered a wetland or shallow freshwater environment. The upper till demonstrates that ice later returned across the site. This sequence records a local interval between glacial episodes, preserved beneath the drumlin landscape of Fermanagh.

Its fossil content indicates an open, treeless and periglacial environment. Grasses, sedges, herbs, juniper and mosses point to tundra-like vegetation rather than forest. Finds associated with the deposit include evidence for plants now familiar from cold or wet ground, such as dwarf willow, lesser clubmoss and bogbean. Insect evidence has been interpreted as consistent with wet ground, open pools and abundant plant matter. The picture is not of a featureless frozen desert: it is of a biologically active but austere mosaic of marshy ground, shallow water and low vegetation, subject to severe winters and repeated freezing and thawing.

That is evidence for a particular north-western Irish locality over an extended phase. It supports an inference that at least some land in the region could sustain freshwater habitats and plant communities despite harsh climate. It does not demonstrate a single uniform “Irish climate”, much less permit a weather report for 31,012 BCE. Upland, coastal and ice-marginal settings may have differed markedly, while the later passage of ice removed or disturbed much of the evidence that might have refined the picture.

Ice Was Growing, Not Static

Ireland’s Last Glacial Period was not a simple story in which the whole island was either wholly iced or wholly open. Research on the British–Irish Ice Sheet shows mobile and regionally asynchronous growth, advance and retreat. At around 31,000 years before present, modelling and geological reconstructions suggest a landscape in transition: substantial ice lay over some high ground and sectors, while other areas could remain ice-free or become temporarily free of local ice. The full maximum volume of the last British–Irish Ice Sheet came much later, around 23,000 years ago in the BRITICE-CHRONO reconstruction.

For people living far later, glaciers would leave the obvious legacy: drumlins, scoured rock, erratic boulders, tills and altered drainage. At this earlier point those landforms were still being made, reworked or waiting to be overrun. Derryvree’s paired tills are a direct reminder that the freshwater interval was temporary. A wetland capable of supporting mosses, sedges and aquatic plants was ultimately sealed by renewed ice. Environmental change, rather than stability, is the central historical fact.

Animals at the Western Edge

Evidence from Castlepook Cave near Doneraile, County Cork, provides the clearest Irish indication that large mammals entered the island during portions of the period before the Last Glacial Maximum. The cave’s old collections include remains attributed to reindeer, woolly mammoth, spotted hyaena, brown bear and other animals. The Irish Quaternary Fauna Project concluded that a comparatively broad mammal fauna colonised Ireland between at least about 45,000 and 20,000 years ago. Later re-dating and reassessment have also shown why individual old dates and cave assemblages require careful handling.

A cave bone collection is not a photograph of a living herd. Carnivores can drag carcass parts into caves; water can move bones; deposits can mix over long periods; and early excavations did not always record context to modern standards. Castlepook is especially important for demonstrating that Ireland formed part of an Ice Age animal world, but it cannot establish that every listed species lived together near Doneraile in 31,012 BCE. Nor can it safely supply exact population numbers, migration routes or seasons.

Nevertheless, the fauna makes the Derryvree landscape easier to understand. Open vegetation, wet hollows and broad exposed ground could support grazing animals in suitable phases, while predators and scavengers exploited them. Such relationships were ecological, not political: no territory, chiefdom, alliance or war can be recovered from these bones. The evidence supports a changing food web, not a prehistoric state.

A Possible Human Trace

Castlepook also raises the most consequential question for Irish human history at this date. A reindeer femur from the cave has been published by Cork County Council as dating to about 31,000 BC and bearing a deep mark interpreted by palaeozoologist Ruth Carden as damage made by a stone tool during butchery. If that interpretation and association withstand further scrutiny, it may be evidence that Upper Palaeolithic people handled a reindeer in Ireland at roughly this horizon. It would push possible human activity on the island far earlier than the better-established post-glacial record.

But the claim must remain proportionate to its evidence. One modified bone is not a settlement. No securely associated hearth, stone-tool assemblage, dwelling surface, burial, store, artwork or repeated butchery area has yet demonstrated a resident community in Ireland at this age. The cave's deposits and collections have complicated histories, and the animal bone's date is not a timestamp for the precise moment when the mark was made. Recent excavation and survey at Castlepook aim to recover better-contexted material, including sediments capable of environmental, dating and microscopic analysis.

The most cautious interpretation is therefore one of possible, perhaps very brief, human presence or visitation rather than proven permanent occupation. If people did reach Ireland, hunting or scavenging large animals is a reasonable inference from the marked femur; the size, composition, technology, language and origin of any group are unknown. Continental European Upper Palaeolithic cultures, cave art and ritual practices cannot simply be imported into Ireland as facts.

No Recoverable Politics

There is no evidence from Ireland around this point for government, diplomacy, organised conflict, religion, trade networks or formal learning in the later historical sense. There are no named leaders, communities, settlements or institutions. Neither farms nor domestic animals nor cultivated crops belong to the known Irish record of this period. If humans visited, their economy would have depended upon mobile foraging in a severe landscape; that remains an interpretation, not a documented local social system.

Religion and culture are similarly beyond direct recovery. A single cave bone or a buried wetland cannot reveal beliefs, stories, kinship rules, music or language. Silence in the record does not prove that people possessed none of these things. It means only that archaeology has not recovered evidence capable of describing them responsibly. The remarkable achievement of the surviving record is different: it preserves the environmental setting in which any human encounter, if it occurred, would have taken place.

What This Year Can Mean

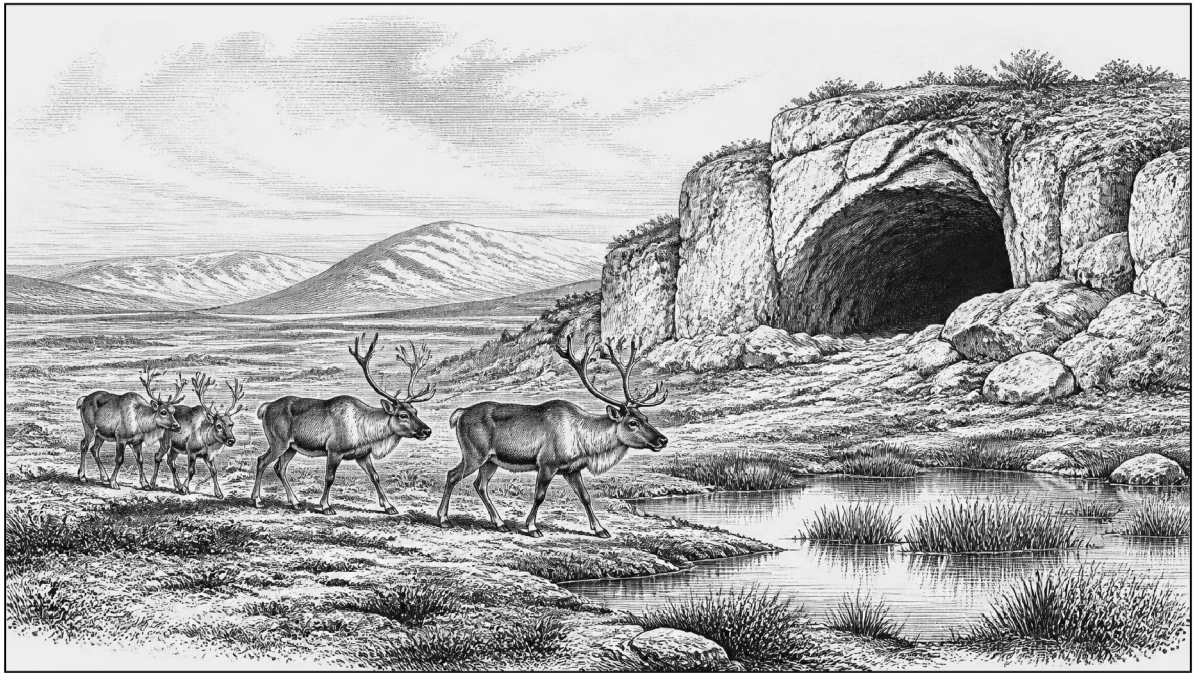
For Ireland, 31,012 BCE represents neither a national beginning nor a calendar-worthy event. It is a point within a long interval of climatic fluctuation, advancing ice and intermittent ecological opportunity. Derryvree preserves an open freshwater tundra environment caught between glacier advances. Castlepook preserves animal remains and a provocative possible trace of human butchery. Together they show an Ireland connected to wider Ice Age processes while retaining a fragmentary and locally uneven archive.

The appropriate history is consequently one of evidence and limits. Beneath later drumlins, a Fermanagh wetland retained seeds, spores, insects and silts. In a Cork cave, bones retained clues to vanished animals and perhaps to a human hand. Those traces do not yield an annual chronicle, but they do make this remote Irish past more tangible: a cold land of open pools and low vegetation, increasingly vulnerable to returning ice, at the edge of the known Upper Palaeolithic world.

Chapter 090 of 100

31011 BCE

A Reindeer Bone at Castlepook^[90]



31,011 BCE is a modern chronological label, not a date at which archaeology can identify an Irish event, ruler, settlement or expedition. Calendar-year precision is not available for Ireland at this depth of time. The most responsible approach is to place the notional year within the later part of Marine Isotope Stage 3 (MIS 3), a highly variable phase of the last Ice Age, and to use calibrated ranges and individual scientific measurements rather than imagine a single day or year. Around this point, Ireland was approaching the expansion of the British–Irish Ice Sheet that would later transform much of the island. What survives is a small, difficult body of environmental and faunal evidence, supplemented by one especially provocative bone from a cave near Doneraile in north County Cork.

A Landscape Without Annals

There were no written records, named peoples, political boundaries or recoverable institutions in Ireland in 31,011 BCE. There is no basis for describing kingdoms, diplomacy, formal warfare, religious leadership, language or a national society. Even the basic question of whether people were present is unresolved. The evidence is instead geological: sediments trapped beneath later glacial deposits, animal bones preserved in caves, pollen and plant fragments, insect remains, and radiocarbon measurements. Each records a particular place and process; none supplies a complete map of the island.

The nominal date falls roughly 32,960 years before AD 1950, the conventional reference point for “before present” dating. That arithmetic does not turn it into an archaeological timestamp. Radiocarbon ages are not calendar years and must be calibrated against changing atmospheric carbon levels. At this antiquity, calibrated ranges can be broad, and a bone dates the death of an animal rather than necessarily

the human action, sediment layer or climatic episode with which it is now associated. The distinction matters particularly in caves, where carnivores, water, frost, collapse and nineteenth- or twentieth-century excavation can mix materials from different periods.

Before the Greatest Ice Advance

In broad climatic terms, this was an interval of the Late Pleistocene before the Last Glacial Maximum. MIS 3, conventionally spanning about 59,400 to 27,800 years ago, was not a single unchanging “Ice Age winter”. Greenland ice-core records demonstrate repeated abrupt swings between colder stadials and relatively milder interstadials, changes capable of reshaping vegetation, animal ranges and the viability of travel across north-west Europe. Ireland’s local record is far less continuous than Greenland’s, so those wider climatic oscillations cannot be assigned mechanically to a particular Irish valley or cave.

Nevertheless, the long-term direction was towards more severe conditions and greater ice-sheet growth. The large BRITICE-CHRONO reconstruction places the growth and retreat of the last British–Irish Ice Sheet within roughly 31,000 to 15,000 years ago, with its maximum volume later, around 23,000 years ago. Thus 31,011 BCE should not be pictured as the island uniformly buried beneath the maximum ice cover. It was, rather, a threshold period: parts of Ireland could still support open cold-climate ecosystems, while the conditions that would ultimately envelop and scour extensive areas were gathering force.

Sea level was lower globally than today because water was stored in continental ice sheets. Exposed shelf landscapes changed the geography around Ireland, Britain and continental Europe, but this does not demonstrate a simple, continuous land bridge usable by animals or people at this particular moment. Reconstructions of the Irish Sea are contested and depend on ice extent, relative sea level and local topography. For human movement, cold water, tidal channels, glacial margins and the availability of food may have been more significant than a line on a map labelled “land”.

Derryvree’s Cold Wetland

The clearest Irish environmental evidence relevant to this broad timeframe comes not from a habitation site but from Derryvree near Maguiresbridge, County Fermanagh. Road works in 1969 exposed organic freshwater silts and fine sands enclosed between tills within a drumlin. The deposit produced a conventional radiocarbon determination of $30,500 \pm 1,170/1,030$ radiocarbon years before present. Calibration places such a measurement several millennia earlier than the modern BCE label used here, rather than precisely in 31,011 BCE; its importance is that it preserves a rare pre-maximum Irish landscape from the same climatic world.

Pollen, seeds, plant macrofossils, mosses and small animal remains from Derryvree point to treeless, periglacial terrain with shallow freshwater, saturated ground and open tundra vegetation. Finds include sedges, bogbean, water-milfoil, dwarf willow, mountain-avens, Arctic clubmoss and a rich moss flora. This was not the later, familiar Ireland of oak woodland, enclosed fields and blanket bog. Nor was it necessarily a featureless white desert. It was a patchwork of pools, wet sedge ground, sparse herb-rich surfaces and seasonally frozen soils: a cold wetland or muskeg within an exposed landscape.

Derryvree is especially valuable because it demonstrates that, during at least one cold phase before overriding ice, parts of Ireland sustained freshwater habitats and a specialised flora. It cannot prove that every region had identical conditions, or that the exact mix of species survived uninterrupted through

every climatic fluctuation. Its sediments were later sealed beneath glacial material, a reminder that much of the evidence for earlier landscapes was destroyed, displaced or buried when ice advanced.

Castlepook's Faunal Archive

In the south, Castlepook Cave—also known historically as Mammoth Cave—near Doneraile has yielded Ireland's most celebrated assemblage of older Ice Age animal remains. Excavations begun by Richard J. Ussher in the early twentieth century, followed by later investigations and reassessments, produced bones of woolly mammoth, giant deer, reindeer, brown bear, spotted hyaena, wolf, Arctic fox, hare and lemmings. Revised radiocarbon work has shown that some Castlepook fauna belongs to MIS 3, with mammals present in Ireland between at least about 45,000 and 20,000 years ago. It is therefore reasonable to place reindeer and other cold-adapted or open-country animals in the wider Irish environmental setting relevant to this article.

The cave was not a village. Its bones chiefly illuminate animal behaviour and site formation. Carnivores could have carried limbs and carcass fragments into chambers; hyaenas in particular may have used caves as dens. A cave collection can therefore combine prey, scavengers and animals dying at different times. Mammoth or hyaena remains do not mean that a mixed herd or pack stood outside the entrance together, still less that humans hunted every species represented. The strongest conclusion is ecological: Ice Age Ireland periodically possessed enough open habitat, forage and connectivity for a diverse large-mammal fauna to reach and inhabit parts of the island.

The Marked Reindeer Femur

The object most closely connected with the conventional date of 31,011 BCE is a reindeer femur from Castlepook. It has been presented by zooarchaeologist Ruth Carden and in County Cork heritage material as dating to about 33,000 years ago, commonly rendered as c.31,000 BCE, and as bearing a deep mark made by a sharp stone implement during butchery. If that interpretation is sustained, it would be extraordinary: evidence that an Upper Palaeolithic person processed a reindeer in Ireland long before the better-established terminal Pleistocene human evidence from Alice and Gwendoline Cave in County Clare, dated to approximately 12,810–12,590 calibrated years before present.

But the correct historical language remains cautious. The femur is evidence for a possible act of carcass processing, not proof of a settlement, a hunting camp, a permanent population or a route by which people arrived. No securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or stratified occupation surface of the same age has yet been published from Castlepook. Earlier cave excavations did not meet modern recording standards, while later glacial and cave processes complicate association. The important fact is not that "Ireland had been settled" in 31,011 BCE; it is that one marked bone has opened a serious question about earlier human incursions.

People, If Present

If people did reach Ireland in this period, they would have been mobile Upper Palaeolithic hunter-gatherers, reliant on intimate knowledge of weather, animal movement, shelter, fuel and routes through changing coastal and glacial landscapes. Reindeer offered meat, fat, hide, sinew, antler and bone; a single

limb bone, however, cannot reveal whether a group killed the animal, found it already dead, exchanged it, or encountered it after carnivores had fed. It cannot identify group size, sex, ancestry, spoken language, belief or technology beyond the possible use of a sharp stone edge.

There is likewise no direct Irish evidence at this date for domestic animals, cultivation, pottery, metalworking, built monuments, formal exchange networks or seafaring. “Economy” can only mean subsistence within a demanding wild environment: animals exploiting seasonal grasslands and wetlands, predators following prey, and perhaps occasional people exploiting carcasses and game. The practical social world, if human visitors were present, would have depended on relationships beyond Ireland, because survival at Europe’s north-western edge required wider knowledge and contact. That is an inference from the setting, not evidence for diplomatic links or a mapped trading system.

Silence, Then Overrunning Ice

The next major regional development was environmental rather than political. As the ice sheet expanded, it remodelled valleys and lowlands, deposited tills, altered drainage and removed or deeply buried earlier surfaces. This helps explain why the Irish Palaeolithic record is so slight compared with those of Britain and continental Europe. Absence of discovered camps is not proof that no person ever entered Ireland; equally, the possibility raised by a cut-marked bone must not be inflated into a narrative of continuous occupation.

For 31,011 BCE, the most vivid defensible image is consequently not a tribe or a battle but an unstable cold-world landscape: open tundra and wet hollows in Fermanagh; reindeer and other mammals moving through suitable habitat; caves in the Cork limestone serving animals and carnivores; and a climate heading towards a glacial maximum that would erase much of what came before. Ireland’s history at this depth is real, but it is fragmentary. Its principal witnesses are silt, pollen, bone and ice.

Chapter 091 of 100

31010 BCE

Derryvree's Moss and Meltwater^[91]



31,010 BCE is a modern calendar label imposed on a world that did not use calendars, writing or recorded regnal years. It therefore cannot identify a dated Irish event, a named person or a particular day. In archaeological terms, it falls about 32,959 years before AD 1950, within the Late Pleistocene and Marine Isotope Stage 3 (MIS 3), a volatile interval of the last Ice Age. The most responsible account is not a conventional annual chronicle but a reconstruction from deposits, fossils and changing scientific methods. The strongest Irish environmental evidence relevant to this broad horizon comes from Derryvree near Maguiresbridge, County Fermanagh, while the most important animal archive lies far to the south at Castlepook Cave near Doneraile, County Cork.

A Date Within a Range

Calendar-year precision is unavailable at this depth in time. Radiocarbon laboratories report ages in years before present, conventionally before AD 1950, rather than in BCE dates. Those results must then be calibrated because the concentration of atmospheric carbon-14 has varied through time. At around 33,000 calendar years ago, calibration produces broad probability ranges, not a pinpoint date. The central Derryvree radiocarbon determination, BIRM-166, was 30,500 radiocarbon years BP, with a substantial uncertainty of +1,170 and -1,030 years. Modern calibration has placed the deposit broadly at c. 36,900–31,700 calibrated years BP. Thus 31,010 BCE lies within the wider horizon illuminated by Derryvree, but cannot be assigned to a particular layer, season, plant or occurrence there.

This distinction is fundamental. A radiocarbon measurement dates the sampled organic material; it does not date all activity in a cave, all vegetation in a county, or the entirety of Ireland. Likewise, a modern conversion into BCE does not create an ancient Irish year. The evidence supports a landscape history spanning centuries or millennia, not a narrative of events in one numbered year.

A Wetland Between Ice Advances

Derryvree is exceptional because roadworks exposed freshwater silts, fine sands and organic-rich layers enclosed between two beds of glacial till. Till is unsorted material laid down directly by glacier ice. The sequence establishes a secure order of events: ice had formerly affected the locality; an interval followed in which freshwater and wetland deposits accumulated; later ice crossed the area and sealed that fragile record beneath another till. It does not prove that all of Ireland was ice-free at once, but it does show that this part of Fermanagh supported an exposed, cold landscape between glacial episodes.

The biological remains recovered from the intervening sediments are unusually informative. Pollen, plant macrofossils, mosses and insects point to open, treeless country under a periglacial regime. Grasses, sedges, herbs, juniper and cold-adapted plants occurred, with freshwater mosses and pools in wetter ground. The assemblage has often been described as tundra or muskeg-like: waterlogged, mossy and sedgy terrain, with shallow open water and organic-rich margins. That description is an interpretation based on several lines of evidence, rather than a claim that Derryvree precisely matched any modern Arctic environment.

It was not the familiar wooded Ireland of later millennia. There is no basis for imagining oak woods, hazel scrub, cultivated clearings or permanent pasture. A short growing season, frost action, strong winds and thin or unstable soils would have constrained vegetation. Yet the presence of freshwater sediments and plant remains is equally important: this was not necessarily an unbroken expanse of snow or bare ice. In favourable hollows, water persisted long enough for a wetland community to form and leave a record.

Climate on an Unsteady Margin

MIS 3 was marked across the North Atlantic region by abrupt climatic shifts. Irish evidence from Crag Cave in County Kerry independently shows episodes when calcite formations could grow, requiring liquid water to pass through the cave and conditions less severe than sustained ground freezing. Such cave records support the broader conclusion that the last Ice Age was not climatically uniform. Derryvree belongs to this unsettled world: locally ice-free ground and freshwater existed, but under markedly cold conditions and within a longer history of expanding and returning ice.

It would be misleading, however, to turn Derryvree into a weather report for every Irish region. Fermanagh's drumlin country, limestone caves in Munster, Atlantic coasts and uplands had different topographies and local conditions. Nor can the exact footprint of ice over Ireland be reconstructed for 31,010 BCE alone. Larger studies of the British-Irish Ice Sheet show that ice growth, flow and retreat varied between sectors, while much of the detailed chronology becomes firmer only later, nearer the Last Glacial Maximum. The safest conclusion is regional: at least parts of northern Ireland had experienced cold, non-glacial conditions before renewed glaciation buried the Derryvree wetland.

Castlepook's Animal Archive

Castlepook Cave offers a contrasting, southern window onto the same broad age. The cave's old excavations recovered more than 2,000 bones from a complicated deposit repeatedly affected by carnivores, water movement and early excavation practice. Direct dates on individual bones now indicate

that the cave accumulated animal remains over a long stretch of the middle and late Ice Age, rather than representing one moment or one intact living community. Geological Survey Ireland identifies it as Ireland's richest site for vertebrate fauna preceding the Last Glacial Maximum.

The dated fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena; later material includes Arctic fox, wolf and lemmings. These species do not all need have lived side by side at 31,010 BCE, and their presence in a cave does not mean the cave was a simple habitation site. Nevertheless, the assemblage demonstrates that parts of Ireland could support large herbivores and predators during portions of MIS 3. Reindeer and giant deer imply grazing or browsing opportunities in open landscapes; hyaenas and wolves point to predator and scavenger relationships; mammoth remains underline how different this Ice Age fauna was from Ireland's later historic fauna.

Castlepook has also prompted discussion of a reindeer femur bearing a mark interpreted by some investigators as possible stone-tool damage from carcass processing. That suggestion is potentially important, but it remains insufficient evidence for a settled human population or a securely documented hunting camp in Ireland at this date. The bone's age, the origin of its surface mark and the disturbed history of the cave deposit are separate questions. A solitary possible modification cannot establish how many people were present, whether they arrived once or repeatedly, what route they used, or whether they remained in Ireland for any length of time.

No Politics, No Settlements

There is no evidence from Ireland around this horizon for political communities, chiefs, territories, diplomacy, warfare, trade networks, houses, hearths, burials or monuments. It would be anachronistic to supply them merely because contemporary Upper Palaeolithic populations elsewhere in Europe made sophisticated stone tools and art. Those wider European comparisons help frame possibilities, but they are not evidence for an Irish society. No named people, languages, ethnic identities or religious beliefs can responsibly be attached to Derryvree or Castlepook at 31,010 BCE.

If people did briefly reach Ireland during this broad period, their most plausible activities would have been mobile and practical: moving through an exposed cold landscape, observing animal movements, seeking sheltered ground, and perhaps processing a carcass. Even that is an inference, not a demonstrated account. There is no securely dated Irish camp assemblage from this age to reveal toolkits, seasonal movement, food-sharing, clothing, kinship or exchange. The first unambiguous evidence for sustained human settlement in Ireland belongs much later, after the harshest phases of the last glaciation.

Deep History, Narrow Evidence

The importance of this date lies not in an invented episode but in what a few difficult records preserve. Derryvree shows a cold, wet, locally ice-free Fermanagh landscape existing between glacial advances. Castlepook records the presence, over a broad span, of mammals adapted to open Ice Age environments and the complex processes by which bones entered a cave. Crag Cave shows that climatic amelioration occurred episodically in south-west Ireland. Together they reveal an Ireland whose geography, ecology and habitability changed sharply long before later human communities arrived.

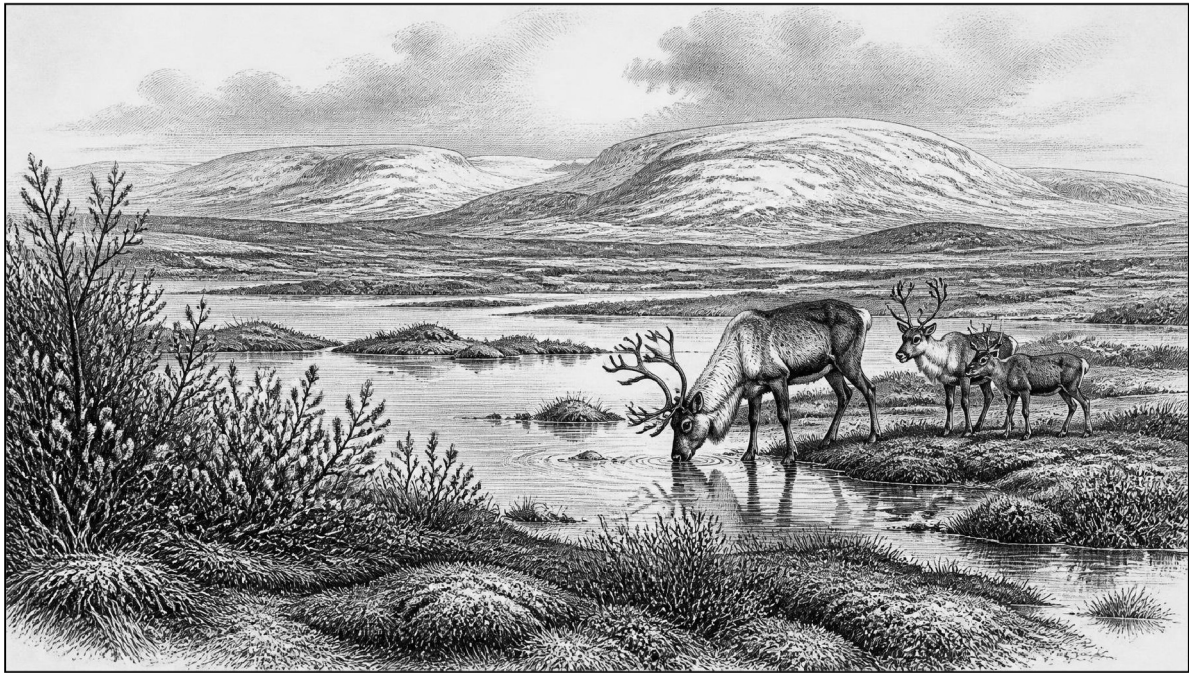
The historical lesson is therefore one of restraint as well as discovery. Around 31,010 BCE, Ireland has no recoverable political history in the ordinary sense. Its history is environmental and archaeological: meltwater settling into a basin, mosses and sedges growing at a pool edge, animals crossing open country,

and later ice sealing or eroding the evidence. Those traces are fragmentary, but they are real. They provide a more compelling account than false precision: an island-region repeatedly reshaped by climate, with life persisting in the intervals that the ice did not erase.

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31009 BCE

Maguirebridge's Bogbean Waters^[92]



Modern calendar-year precision is not available for Ireland in 31,009 BCE. No written chronology, settlement sequence or dated event can identify what happened in that particular year. The responsible approach is to place the notional date within the Late Pleistocene, broadly Marine Isotope Stage 3 and the Irish Midlandian cold stage, and to use evidence whose ranges overlap it. Around 32,959 calibrated years before present (where “present” is conventionally AD 1950), Ireland was a changing Ice Age landscape. Its history survives not in annals but in sediments, pollen, seeds, insects, animal bones and the marks left by later ice.

A Date Within Broad Ranges

The closest exceptional environmental archive lies at Derryvree near Maguiresbridge, County Fermanagh. Roadworks exposed freshwater sands, silts and organic layers sealed between two tills: unsorted deposits made by glacier ice. Their order is clear. Ice had occupied or affected the district; a period of freshwater and wet-ground deposition followed; then another glacial advance buried the record. Organic material from the deposit produced a conventional radiocarbon determination of $30,500 \pm 1,100$ radiocarbon years BP. That is not a calendar date. When calibrated, it corresponds to a broad interval, commonly expressed at roughly 36,900–31,700 calibrated years BP, rather than to a single year. The range encompasses the requested horizon, but does not prove that every plant or pool described by the deposit existed in 31,009 BCE itself.

This distinction matters. Derryvree was an accumulating wetland record, not a moment frozen in time. Radiocarbon dating gives an age estimate for carbon in sampled organic matter; calibration translates that estimate probabilistically against changing atmospheric radiocarbon. The large uncertainty of the original measurement, the duration over which sediment accumulated and the later disturbance

caused by glaciation all require restraint. The deposit can illuminate conditions in part of northern Ireland around this broad period. It cannot provide an annual weather report, a political history or a date for an individual animal's death.

Open Water in a Treeless Country

What Derryvree does demonstrate is a cold, open, periglacial wetland landscape. Pollen, plant macrofossils, mosses and insect remains indicate that local freshwater pools and saturated ground supported vegetation despite harsh conditions. Sedges and grasses were important. Fossil evidence also includes dwarf willow, lesser clubmoss, bogbean and water-milfoil: plants suited to open ground, wet margins or shallow water. Their presence should not be turned into a picturesque certainty about a whole island. It does, however, show that at least one Fermanagh locality was not simply a lifeless field of ice at the time its organic beds formed.

The landscape was tundra-like rather than forested. There is no evidence for closed woodland, arable fields or managed pasture. Low vegetation would have been exposed to strong winds, frost, short growing seasons and marked seasonal contrast. Moss-rich ground and plant-filled pools could coexist with more sparsely vegetated mineral soils. Insects recovered from the deposit support this reconstruction of muskeg or marshy tundra with open water. The fossil plants are direct evidence of local habitats; interpretations of regional temperature, rainfall and seasonality are necessarily broader inferences from that ecology and from comparison with cold environments elsewhere.

Animals at the Atlantic Edge

Irish cave collections provide a second, different window. Castlepook Cave, near Doneraile in north County Cork, is the island's richest known Pleistocene vertebrate locality. Its old excavations recovered remains attributed to mammoth, reindeer, giant deer, horse, brown bear, wolf, fox, hare, lemmings and spotted hyaena, among other animals. Not every specimen belongs to the same time, and the cave deposits were disturbed by carnivores, water movement and early excavation. Nevertheless, radiocarbon programmes and subsequent reassessment show that a varied large-mammal fauna reached Ireland before the Last Glacial Maximum.

For the broad period surrounding 31,009 BCE, the combination of Derryvree and Castlepook suggests an island with exploitable but demanding habitats: wet tundra in parts of the north and open country capable of supporting grazing and browsing mammals in the south. Reindeer are especially compatible with such a world, though an animal bone from a cave does not map an entire herd range. Hyaena remains are equally important reminders that caves may have been dens, scavenging places and bone traps rather than human shelters. The animals indicate episodes of connectivity with wider north-west European populations during low-sea-level phases; they do not establish a simple, permanently dry land bridge or a constant route into Ireland.

The Castlepook Human Question

A reindeer femur from Castlepook has made this period unusually significant for Irish prehistory. It has been reported as bearing a deep modification interpreted as a cut or chopping mark made on fresh bone with a sharp stone tool. Public heritage material has associated the specimen with about 31,000 BC,

while reports of its radiocarbon age have used other chronological conventions. If the modification is confirmed as human-made, it would be evidence that somebody processed a reindeer in Ireland during the Upper Palaeolithic, vastly earlier than the formerly accepted record of post-glacial human activity.

It is vital, however, to state what the bone cannot yet demonstrate. It is not proof of a permanent Irish population, a village, a hunting territory, a family group or continuous occupation. The specimen derives from an older cave collection rather than a securely excavated living floor with associated stone tools, hearths, structures and discarded food remains. A bone date gives the age of the animal's death, not necessarily the instant when a surface mark was made. Carnivore damage, sediment abrasion, breakage and excavation damage must be excluded through detailed taphonomic study. Recent work at Castlepook has identified surviving deposits and renewed scientific interest, but the 2022 excavation recovered no cultural artefacts.

People, Society and Culture

Accordingly, society around this date remains unknown rather than absent. If people did reach Ireland, they were most plausibly highly mobile hunter-gatherers operating within the wider Upper Palaeolithic world of north-west Europe, using perishable equipment and stone tools that have not yet been securely recovered in Ireland from this horizon. That is an interpretation based on neighbouring regions and the proposed Castlepook evidence, not a demonstrated Irish social system. There is no responsible evidence for named groups, languages, chiefs, clans, territorial boundaries, laws or diplomacy.

There is likewise no evidence here for agriculture, herding, pottery, metalworking, markets, overseas commerce, monuments, formal burial, art or organised religion. A single possible butchered bone could suggest the practical use of animal meat, hide, marrow or sinew, but cannot reveal ritual, belief or learned tradition. The most meaningful “economy” visible in the evidence is ecological: animals feeding across open country, carnivores using caves, and any possible visitors obtaining resources from a difficult seasonal landscape. Trade cannot be inferred. Nor can conflict: predation and competition among animals are not evidence of human warfare.

Ice Was Approaching

The date sits before the fullest development of the last British–Irish Ice Sheet. Large-scale reconstructions show that ice growth and maximum extent varied between sectors, with major advances and shelf-edge ice later in the last glacial cycle. By roughly 27,000–23,000 calibrated years ago, the Irish Ice Sheet achieved much of its last maximum extent; its effects erased or buried extensive earlier evidence. At about 31,009 BCE, therefore, it is misleading to imagine either a uniformly ice-covered Ireland or a stable ice-free island. Northern Ireland may already have contained growing ice centres, while the Derryvree record preserves an earlier or broadly overlapping ice-free wetland interval whose exact relation to every regional glacier remains uncertain.

That later ice is part of the story, not merely an obstacle to it. It explains why the archaeological record is so slight and why Derryvree and Castlepook carry such weight. Their evidence reveals a real Ice Age Ireland of freshwater pools, sparse tundra vegetation and substantial mammals, while also exposing the limits of present knowledge. For 31,009 BCE, the strongest conclusion is not a year-specific event but

a carefully bounded one: Ireland lay within a volatile cold-stage world, and its rare surviving deposits preserve habitats and animals that make a possible early human visit worth investigating, not yet a settled national prehistory.

Chapter 093 of 100

31008 BCE

Derryvree's Bogbean Basin^[93]



Modern calendar-year precision is not available for Ireland in 31,008 BCE. This is not a year that anyone on the island could have named, recorded or remembered in an annual chronicle. It is a point projected backwards from a modern calendar, roughly 32,960 years before AD 1950 on the conventional “cal BP” scale. The responsible history is therefore not of a dated event, ruler or settlement, but of a broad Late Pleistocene interval whose environmental and faunal evidence overlaps this notional date.

That interval belongs to Marine Isotope Stage 3 (MIS 3), a climatically unsettled part of the last Ice Age. Ireland was not yet uniformly buried beneath the later maximum of the British–Irish Ice Sheet, but neither was it a familiar green island. Ice, water, vegetation and coastlines changed over centuries and millennia, often differently from one region to another. The most illuminating Irish record close to this date lies beneath a drumlin at Derryvree, near Maguiresbridge in County Fermanagh: a small, buried freshwater world that survived because later ice sealed it.

A Date Within a Range

The key Derryvree organic deposit produced a conventional radiocarbon determination of 30,500 +1,170/–1,030 radiocarbon years BP. A radiocarbon age is not itself a calendar age: atmospheric carbon-14 has fluctuated through time, and older samples require calibration against independently dated records. Modern calibration curves extend this far back, but their ranges are necessarily broad. Published discussion places the Derryvree material approximately within 36,900–31,700 calibrated years BP. The modern label 31,008 BCE falls within that wide span, not at a known beginning, end, season or moment in the deposit's formation.

This distinction matters. Derryvree cannot tell us what happened throughout Ireland in one twelve-month period. It does, however, establish a sequence of considerable importance. A lower till shows that glacier ice had previously occupied the locality. Fine sands, silts and organic-rich freshwater sediments then accumulated during an interval when the site was not overridden by ice. A later till buried the wetland beneath renewed glacial debris. The record is thus direct evidence for local environmental change: ice, an ice-free freshwater setting, then ice again.

Fresh Water Between the Tills

Derryvree was exposed during roadworks in 1969. Its preservation is exceptional because ice sheets commonly erode, disperse or conceal the ground surfaces on which earlier life took place. Here, the sediment trapped between tills retained pollen, plant macrofossils and insect evidence. These remains do not reveal a village or a hunting camp. They reveal the biological character of a wet place: shallow fresh water, waterlogged margins and open ground in a cold climate.

The assemblage includes mosses, sedges and plants associated with freshwater or damp ground, among them bogbean and water-milfoil. Dwarf willow, mountain-avens and other cold-tolerant vegetation support an interpretation of largely treeless, tundra-like country rather than woodland. This should not be imagined as a single uninterrupted plain of snow. A more faithful reconstruction is a mosaic of pools, wet sedge beds, mineral ground, low shrubs and exposed ground, changing with drainage, season and climate. The basin itself could have remained biologically productive even while the wider landscape was harsh and windswept.

Such evidence is local, but it has wider significance. Other Northern Irish inter-till deposits, including those at Greenagho near Belcoo and Aghnadarragh in County Antrim, show that the Irish record contains more than one cold-stage episode and more than one phase of ice advance. They also warn against treating “the Ice Age” as a single frozen condition. Ireland’s landscapes altered repeatedly; old regional schemes and individual dates are continually reassessed as laboratories, calibration methods and geological models improve.

Ice on the Horizon

At about this point in deep time, the British–Irish Ice Sheet was building towards its later major expansion. Recent reconstructions begin at 31,000 years ago precisely because earlier ice limits are difficult to constrain. They indicate that ice accumulation and mountain glaciers were possible in parts of Ireland, while the amount and distribution of ice remain uncertain. One reconstruction depicts a substantial ice cap in north-western Ireland and smaller ice fields or glaciers in several uplands; it is a model constrained by uneven evidence, not a photograph of the island.

The fullest expansion came later. The maximum areal extent of the wider British–Irish Ice Sheet is placed around 26,000 years ago, with different sectors reaching their maxima at different times. Thus 31,008 BCE should be understood as an ice-sheet build-up interval, not as the Last Glacial Maximum itself. Derryvree’s buried wetland is particularly valuable because it demonstrates that, within this variable setting, at least one part of Fermanagh had an ice-free freshwater environment before a subsequent advance.

Sea level was also lower than today because enormous quantities of water were locked in global ice sheets. Reconstructions for 31,000 years ago indicate relative sea levels across the British–Irish region tens of metres below present levels, producing very different coastlines and exposing parts of the

continental shelf. Yet this does not prove a simple, continuous land bridge from Ireland to Britain or mainland Europe. The Irish Sea basin was complex; local ice loading altered land levels, while sea, ice and coastline shifted through time. Routes taken by animals, and any people, cannot be identified from lowered sea level alone.

Animals and Cave Archives

Southern Irish caves provide a complementary, if less neatly stratified, record. Castlepook Cave near Doneraile in north County Cork contained remains of reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, lemmings and spotted hyaena. These finds show that Ireland was connected ecologically to the wider north-west European world often enough for cold-adapted and large mammals to reach it. They do not prove that all the species lived together in one herd-filled landscape, or even that every specimen belongs to the same century. The cave accumulated bones over very long periods, and water movement, carnivore activity and early excavations have complicated the original contexts.

Radiocarbon re-dating has made the Castlepook archive both more important and more difficult. Some older determinations have proved unreliable when bone samples were retested using improved pretreatment. The principal conclusion remains secure: Irish caves preserve a time-depth of Late Pleistocene fauna extending well before the final retreat of the ice. The more ambitious claim—that a particular bone recreates a complete local ecosystem—does not follow. A mammoth bone may have been dragged, washed or redeposited; hyaenas may have used parts of a cave differently from bears or accidental animal falls.

For everyday animal life, then, evidence is strongest for ecological possibilities rather than a precise scene. Reindeer and lemmings imply open, cold habitats; large herbivores required accessible forage; carnivores and scavengers exploited prey, carrion or cave shelter. Their presence indicates movement through a changing landscape, not domestication or a human-managed economy. There was no agriculture, stock-raising, metalworking, market system or demonstrable Irish trade network at this date.

The Human Question

One Castlepook reindeer femur has attracted exceptional attention. County Cork heritage material, drawing on the reassessment of the National Museum of Ireland collection by zooarchaeologist Ruth Carden, identifies a deep mark as a possible stone-tool trace made while fresh bone was being processed. The bone has been publicly presented as dating broadly to around 31,000 BCE. If the mark is genuinely anthropogenic and contemporary with the animal's death, it may represent a very early human encounter with a reindeer in Ireland.

The claim is important, but its limits must govern the interpretation. The femur was recovered during early twentieth-century cave excavation, rather than from a modern, sealed occupation floor. No securely associated stone-tool assemblage, hearth, shelter, burial, repeated butchery area or settlement of comparable age has been found in Ireland. A date for the animal establishes its broad age, not the exact time of a surface mark, where the animal was killed, or how long people remained. Natural damage, carnivore activity, sediment movement and the difficulty of old collections all demand specialist caution.

The most that can responsibly be said is that the Castlepook femur is compatible with a brief visit by mobile Upper Palaeolithic people who had access to a reindeer carcass and a sharp implement. It cannot demonstrate a resident population, continuous occupation, a named cultural group or descent into later Irish communities. The securely published evidence for human activity is much later: cut marks on a

brown-bear patella from Alice and Gwendoline Cave, County Clare, date to about 12,810–12,590 calibrated BP. That later discovery demonstrates why a single worked bone can be consequential, but it does not confirm the earlier Castlepook interpretation.

No Politics, but a Deep History

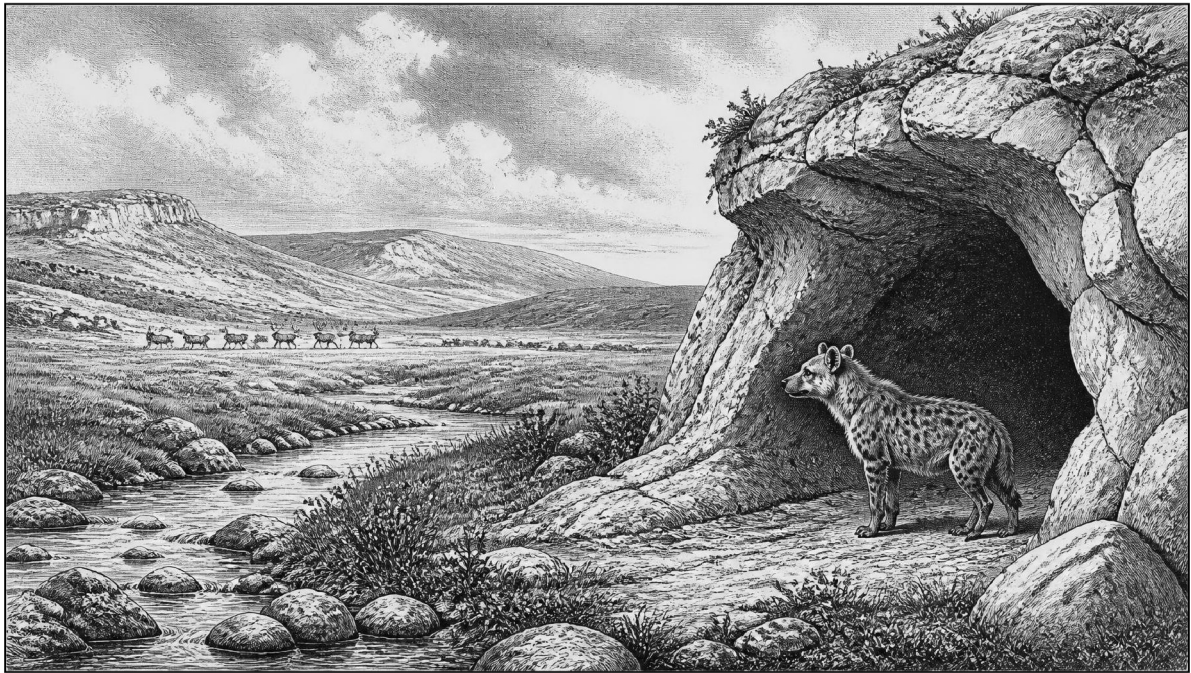
Political affairs, diplomacy, warfare, religion, named leaders, languages and formal learning cannot be recovered for Ireland at this date. There is no evidence for an Irish polity, permanent settlement or ritual monument. It would be misleading to supply them from better-known Upper Palaeolithic societies elsewhere in Europe. Even if people briefly reached Ireland, the archaeological record has not yet revealed how they organised themselves, what languages they spoke, what beliefs they held or whether they returned.

Yet the absence of chronicles is not an absence of history. Around the modernly designated year 31,008 BCE, Ireland was part of an unstable north-west European Ice Age world. At Derryvree, cold-water plants and sediments accumulated in a freshwater basin between episodes of glaciation. In southern caves, animal bones preserve evidence of wide-ranging mammal communities and changing ecological links. The approaching growth of ice would remodel the island and erase or bury much older ground. What survives is fragmentary, but it is sufficient to replace a blank past with a carefully bounded one: a landscape of sedges, open water, large animals and advancing ice, with the possibility—but not proof—of fleeting human presence.

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31007 BCE

Castlepook's Carnivore Passage^[94]



31,007 BCE is not a year that can be recovered from Ireland's evidence in the way that a later historical year can. No written calendar, settlement sequence or securely dated event allows archaeology to distinguish this one modern calendar label from the centuries on either side of it. Expressed in archaeological convention, it lies about 32,956 years before AD 1950, within the later part of Marine Isotope Stage 3, an unstable phase of the last Ice Age. The responsible history of Ireland at this point is therefore not an annual chronicle, but a carefully bounded account of landscapes, animal remains and a possible human trace.

That distinction matters. A date given as "about 33,000 years ago" may be a radiocarbon age, a calibrated calendar estimate, or a rounded public description; these are not interchangeable. Ireland's Pleistocene record is fragmentary, and many important cave discoveries were made before modern excavation and sampling methods. Around this notional date, the island's evidence can illuminate a cold-world ecology and the possibility of brief human activity. It cannot demonstrate a kingdom, a named people, permanent villages, trade routes or a political frontier.

A Changing Ice-Age Island

Ireland was then in the Midlandian cold stage, the Irish expression of the last glacial cycle. This was not one unbroken deep freeze. Climate shifted abruptly over millennia and centuries; glaciers advanced and retreated; sea level stood substantially lower than today; and the extent of ice varied greatly by region and time. The maximum expansion of the last British-Irish Ice Sheet belongs later, broadly after about 26,000 years ago, with evidence for major ice advance west of Ireland after $24,720 \pm 260$ calibrated years BP. Thus 31,007 BCE should not be pictured automatically as an island buried beneath its final, fullest ice cover. It was instead part of the long, climatically deteriorating approach to that maximum.

What the terrain looked like locally is harder to establish. Ice, frost, running water and later erosion removed or disturbed much of the evidence. Geological Survey Ireland's mapping records tills, glaciofluvial and glaciolacustrine sediments, landforms and striae across the island, reminders that the landscape has repeatedly been remodelled by ice. Modern eskers, drumlins and valleys are not a direct view of 31,007 BCE, but they are part of the long Quaternary inheritance of those transformations.

There are important signs that, at least in some intervals and some districts, Ireland supported open cold-climate environments rather than a uniform ice sheet. Older stratigraphic work in Ulster identified a middle Midlandian phase described as cold but non-glacial, represented by organic deposits beneath later tills and conventionally dated to around 30,500 radiocarbon years BP. Such figures are broad chronological anchors, not dates for a particular season or a single island-wide landscape. They nevertheless show why a simple narrative of uninterrupted ice cover is misleading.

The Castlepook Archive

The strongest directly relevant Irish evidence comes from Castlepook Cave, also called Mammoth Cave, near Doneraile in north County Cork. The limestone cave system lies in the Awbeg Valley, below the Ballyhoura Hills. Excavations from the early twentieth century produced a remarkable collection of Ice Age animal bones, much of it now associated with the National Museum of Ireland. Recent work has returned to the site because the early excavators lacked today's methods of sediment recording, microscopic analysis, sieving, accelerator dating and ancient-DNA research. A 2022 project specifically sought intact deposits and a better understanding of the old collection.

Castlepook is particularly valuable because it preserves evidence of an animal community that has no modern Irish equivalent. Spotted hyena remains make it Ireland's most important last-cold-stage mammal site. Museum research places hyenas and associated mammals at Castlepook within a broad migration and occupation window of roughly 45,000 to 30,000 years ago, interpreted against climate and changing sea levels. Other remains from the cave assemblage include reindeer, woolly mammoth, giant deer, brown bear, wolf, Arctic fox, stoat, mountain hare and lemmings. Not every species necessarily lived there at the same moment, and a cave bone collection is not a census of the surrounding countryside. Yet together they establish that southern Ireland was connected to a wider north-west European cold-stage fauna.

Hyenas are especially important for interpreting the cave. They could drag carcass parts underground, break bones, leave droppings and accumulate a mixed assemblage over a long period. Water, collapse, frost and scavenging could further alter deposits. Castlepook should therefore not be imagined as a human hunting camp simply because bones occur there. It was above all a carnivore landscape: a place where large herbivores, predators and scavengers moved through seasonally difficult country, and where caves could become dens, traps or repositories of transported remains.

A Reindeer Bone and a Human Question

The most arresting possibility is a reindeer femur from Castlepook that has been publicised as bearing a deep mark made by a sharp stone implement during carcass processing. County Cork heritage material associates the object broadly with "31,000 BC", while recent research and public discussion have treated it as potential evidence of Upper Palaeolithic human activity far earlier than the securely documented post-glacial occupation of Ireland. If the mark is confirmed as anthropogenic, it would show that a person handled a reindeer carcass on the island during the Ice Age. It would be a major discovery.

But the limits of that claim must be stated just as plainly. The bone came from an old cave collection, not a freshly excavated occupation floor containing hearths, stone tools, structures and food debris in secure association. A radiocarbon determination dates the animal's death, not necessarily the exact moment at which a surface mark was made. Distinguishing a cut made by a stone tool from damage caused by carnivores, excavation, breakage or other processes requires specialist taphonomic assessment. Ongoing research has found further Pleistocene-bearing deposits, but the evidence presently available does not establish a settled population at Castlepook or elsewhere in Ireland.

This is where calibrated ranges are essential. Recent reassessment of Irish cave fauna has demonstrated that some older bone dates can be seriously misleading: at Castlepook, ultrafiltration re-dating showed one reindeer antler to be more than 7,500 years older than a 1990s result. By contrast, directly dated reindeer remains from Alice and Gwendoline Cave in County Clare belong much later, to calibrated ranges of 12,620–11,885 and 12,745–12,487 cal BP. Those later ranges cannot be projected backwards to the Castlepook femur. They underline why “about 33,000 years ago” is a research problem, not calendar-year precision.

Life Without a Recorded Society

If people did reach Ireland in this broad period, the most defensible interpretation is of brief, small-scale movement through a demanding northern Atlantic environment. A single modified bone could reflect butchery of a carcass, whether hunted, found dead or taken from another predator. It does not reveal the size of a group, its language, kinship, beliefs, territory or route of arrival. Nor does it prove repeated seasonal visits. Reindeer would have offered meat, hide, sinew, marrow and bone, but no Irish assemblage of this age allows us to reconstruct an economy from those possibilities.

Accordingly, political affairs, diplomacy and organised conflict are absent from the record—not because Ice-Age people elsewhere lacked social lives, but because Ireland supplies no evidence from which they can responsibly be described here. There are no known houses, graves, monuments, art objects, toolkits or ritual deposits securely attributable to this point around 31,007 BCE. There is no basis for speaking of tribes, chiefs, alliances, trade or religious institutions. Silence is not proof that none existed; it is the boundary of the surviving evidence.

The same caution applies to culture and learning. Continental Europe preserves rich Upper Palaeolithic traditions, including sophisticated stone technology, portable art and cave art. It would be unsound to transfer any named archaeological culture wholesale across the sea to Ireland on the strength of one disputed or provisional trace. Ireland may have been visited by people who knew such wider traditions, but that is an inference about regional possibility, not a demonstrated Irish cultural identity.

Regional Change and Deep Time

The broader environmental story is more secure than the human one. Open herb-rich ground, tundra-like vegetation, patches of wetland and sheltered valleys could support grazing animals, while carnivores followed prey or scavenged carcasses. At the same time, worsening cold and the growing ice sheet would have made habitats unstable. Faunal movements and any human visits depended on changing coastlines, weather, vegetation and access through or around glaciated terrain. The familiar wooded and farmed Ireland of later millennia was still unimaginably distant.

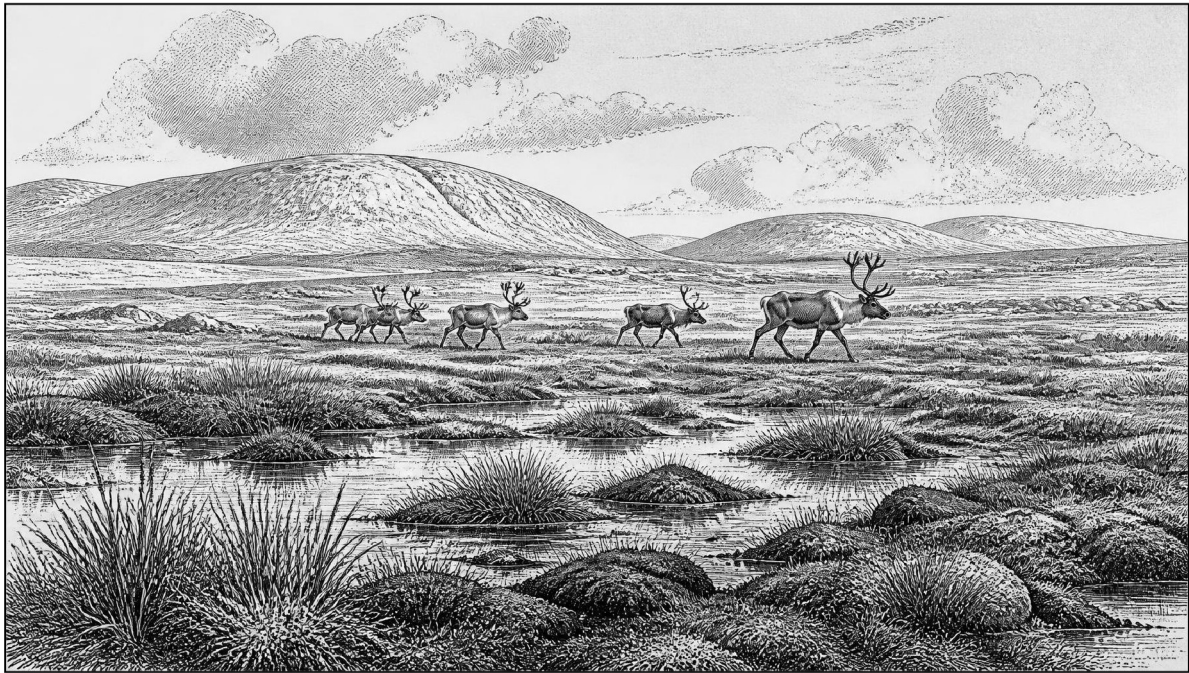
The subsequent advance of ice helps explain the scarcity of traces. Glacial erosion could strip deposits; later sediment could bury them; acidic soils often destroy bone outside favourable limestone caves. The archaeological record is therefore biased towards unusual survival places such as Castlepook and towards museum collections whose original contexts are imperfect. Geological and archaeological research continues to refine the island's Quaternary map and cave chronology, so conclusions remain provisional.

For Ireland around 31,007 BCE, then, the key development is neither a recorded battle nor the foundation of a settlement. It is the existence of a cold-stage ecological corridor in which reindeer, hyenas, mammoths and other animals reached the island, and in which a reindeer femur may preserve evidence of human action. Castlepook offers an extraordinary opening onto that world, but not a licence to invent one. Its lesson is methodological as much as historical: deep Irish history begins with fragments, date ranges and contested marks, and gains clarity only when evidence and interpretation are kept distinct.

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31006 BCE

Castlepook's Reindeer Dilemma^[95]



A Date Without a Dated Event

31,006 BCE cannot be treated as a year in the ordinary historical sense. No Irish written record, settlement sequence or archaeological deposit can be resolved to that exact calendar year. The number is useful only as a modern point within a much wider Late Pleistocene interval: roughly 32,955 calibrated years before AD 1950, in Marine Isotope Stage 3 (MIS 3), during the last glacial cycle. The responsible account of Ireland at this depth of time is therefore built from calibrated ranges, cave bones, sediments, pollen, insects and glacial landforms—not from named people, events or annual chronicle.

It was not yet the Last Glacial Maximum, when the British–Irish Ice Sheet reached its greatest later extent. Around the broad period containing 31,006 BCE, conditions were severe but highly variable. Greenland ice-core records and Irish cave deposits show that the last glacial period was punctuated by abrupt shifts: comparatively milder interstadials alternated with colder stadials. Ireland's climate, vegetation and ice cover did not change everywhere at once. A single nationwide picture—whether of a wholly frozen island or a habitable green refuge—is misleading.

The chief evidence relevant to this nominal year comes from two very different kinds of archive. In County Fermanagh, water-laid organic deposits beneath later glacier sediments record a cold, treeless freshwater environment. In north County Cork, Castlepook Cave near Doneraile preserves bones from a striking Ice Age fauna and one especially debated reindeer femur. Together they illuminate an Ireland of open ground, wetlands, large mammals and advancing climatic instability. They do not establish a permanent human population.

Derryvree Between the Ice Sheets

The most informative environmental evidence lies at Derryvree near Maguiresbridge, County Fermanagh. There, researchers found organic-rich freshwater sediments sandwiched between two tills: compacted deposits left by glaciers. The sequence has an obvious historical importance. First, ice had occupied the locality and laid down the lower till. Then, during an interval when the site was free of overriding glacier ice, shallow freshwater and wet ground accumulated silt, plant remains and insects. Finally, renewed glaciation deposited the upper till and sealed the earlier landscape.

A conventional radiocarbon determination from Derryvree was published as 30,500 $\pm$ 1,170–1,030 radiocarbon years BP. Radiocarbon years are not calendar years, and the wide uncertainty matters. Later discussion has calibrated the age broadly to about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. Thus 31,006 BCE falls near the younger end of a range that can responsibly be associated with this record, rather than being a moment identifiable within it.

The Derryvree flora and fauna describe a cold northern landscape, not woodland. Freshwater mosses, sedges and aquatic plants indicate wet margins, pools and sluggish water; insect evidence likewise points to chilly conditions. The landscape is often characterised as muskeg or tundra wetland: patchy, waterlogged ground with low vegetation, open water and seasonally difficult terrain. Such a setting could sustain specialised plants and animals, but it offered neither the stable forest resources nor the agricultural potential familiar from much later Irish prehistory.

Related deposits at Hollymount and Greenagho in County Fermanagh, and at Aghnadarragh in County Antrim, reinforce the crucial point that glaciation was episodic and regionally varied. They are not all precisely contemporary with Derryvree, nor can their dates be compressed into a single climatic episode. Yet they demonstrate that parts of northern Ireland retained or regained ice-free ground during portions of the long cold stage. Their pollen, plant and insect assemblages consistently suggest open, cold environments rather than dense forest.

Open Country and Unstable Seasons

Around this period, Ireland's geography also differed fundamentally from that of the modern island. Global sea level was lower because immense volumes of water were held in continental ice sheets. The Irish Sea basin was therefore shallower and land connections or narrowed crossings between Ireland, Britain and continental Europe varied through time. That does not mean a simple, dependable land bridge existed at the precise date in question. Coastlines, sea levels and ice margins changed repeatedly, and the routes available to animals or people remain matters for regional reconstruction rather than assumption.

Evidence from southern Irish caves confirms that cold-adapted and large mammals reached Ireland during MIS 3. Castlepook has produced reindeer, giant deer, woolly mammoth, brown bear, hare, fox and spotted hyaena remains. The cave collection is exceptionally important because it shows that the island supported, at different times, a more varied Ice Age fauna than its modern ecology suggests. Reindeer particularly suit an open, treeless setting, while hyaenas and other carnivores indicate a food web containing substantial herbivores.

That fauna should not be imagined as a fixed herd grazing one unchanging plain in 31,006 BCE. Cave deposits accumulated over long intervals and may combine material brought in by carnivores, water, natural deaths and excavation practices that predated modern recording. Individual animals did not

necessarily live together or occupy exactly the same local habitat. Nevertheless, the assemblage makes one conclusion secure: southern Ireland was accessible to large mammals during parts of the pre-maximum glacial period, and it contained landscapes capable of sustaining them.

The Reindeer Femur Question

Castlepook's relevance to this date centres on a reindeer femur held in the National Museum of Ireland's Natural History collections. County Cork heritage material describes it as a Palaeolithic bone of about 31,000 BC and identifies a deep mark as one made with a sharp stone tool while the animal was butchered. If that diagnosis proves sound, the object would be potentially momentous: evidence that one or more people handled a reindeer carcass in Ireland during the Upper Palaeolithic, many millennia earlier than the island's long-established post-glacial archaeological record.

Yet the qualifications are as important as the possibility. The femur comes from an old cave archive, not from a modern excavation in which its precise sedimentary position, associated artefacts and activity surface were recorded together. A date on bone establishes when the animal lived or died, not the exact instant when the mark was made, the location of any killing, or the length of any human visit. The bone may have been processed outside the cave and later transported underground by scavengers. Carnivore damage, breakage and excavation history all require close taphonomic scrutiny.

Most importantly, Castlepook has not yielded a securely associated hearth, stone-tool assemblage, dwelling floor, burial, refuse deposit or repeated occupational layer of this age. The National Museum of Ireland continues to state that clear evidence for Palaeolithic human presence in Ireland has not yet emerged. It is therefore best to describe the marked femur as a serious and potentially transformative claim, rather than as proof of an established Irish Palaeolithic community. Ongoing work at the cave may clarify the issue, but it cannot be anticipated as a conclusion.

People, Society and Belief: What Cannot Be Recovered

There is no evidential basis for political affairs, diplomacy, territorial communities, warfare, leaders, languages or kin groups in Ireland in 31,006 BCE. Nor can archaeology identify Irish religion, ritual, art, learning, trade networks or social organisation at this date. It would be tempting to import images of Upper Palaeolithic hunting societies from France, Iberia or central Europe. Such comparisons can suggest what mobile hunter-gatherers elsewhere were capable of—co-operative hunting, hide-working, stone-tool production and seasonal movement—but they do not fill Ireland's silence with facts.

If people did reach Ireland during this broad interval, the Castlepook evidence would be consistent only with a brief, small-scale episode of access to an animal carcass. Reindeer could have supplied meat, fat, hide, sinew and bone; a sharp stone edge would have been an effective implement for cutting tissue. These are general observations from hunter-gatherer technology, not documented details of a Castlepook camp. No Irish tool from this time has been securely recovered, and no exchange or trade can be demonstrated.

For the same reason, there is no known permanent settlement. The most defensible human-scale image is not of villages but of a landscape that may occasionally have been visited by highly mobile people, just as it was used by mobile animals. Even that remains conditional. Ireland's archaeological record has been heavily reduced by subsequent glaciation, erosion, rising seas and early excavations, so absence of evidence is not absolute proof of absence. But the sparse record cannot justify claims of continuous habitation.

An Island Approaching Greater Cold

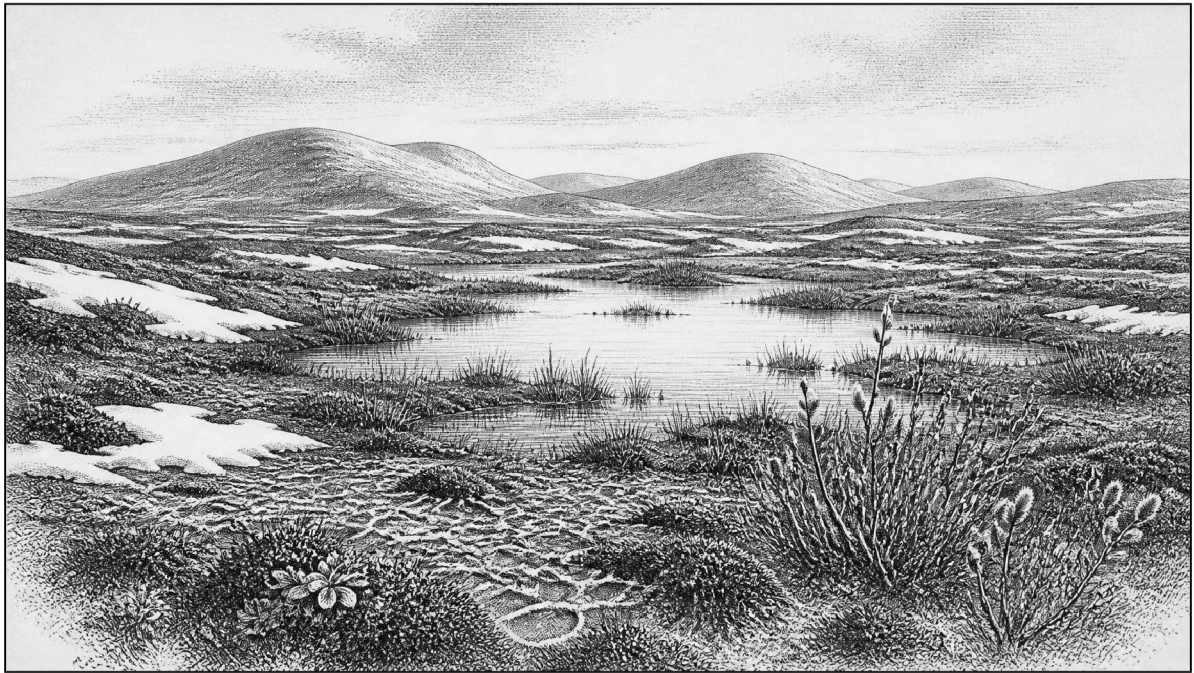
The larger development was environmental. The climatic oscillations of MIS 3 were giving way towards the more extensive glaciation that would follow. Irish ice-sheet histories remain debated in detail, especially before the Last Glacial Maximum, but the evidence agrees that ice growth was uneven, dynamic and capable of overriding earlier soils, wetlands and archaeological traces. Derryvree's freshwater bed survives precisely because it was buried between tills; most exposed surfaces from its time have not survived so clearly.

Thus the best history of Ireland around 31,006 BCE is one of fragile evidence and powerful environmental change. Derryvree preserves a cold wetland under later ice. Castlepook preserves an animal world of reindeer and predators, plus an unresolved mark that may record human butchery. These are not the foundations for a conventional national narrative. They are, however, enough to show that Ireland was neither archaeologically blank nor environmentally uniform: it was a changing north-western edge of Ice Age Europe, intermittently open to freshwater life, large mammals and perhaps fleeting human encounter.

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31005 BCE

Maguiresbridge's Road-Cut Tundra^[96]



The label 31,005 BCE gives a useful place in a modern timeline, but it cannot identify a recoverable Irish year in the way that it can for literate history. No calendar, settlement sequence or event record exists for this point in the Late Pleistocene. The evidence is instead geological and biological: layers of sediment, pollen, seeds, mosses, insects, cave bones and the traces left by advancing ice. These materials are dated in ranges, often with substantial uncertainty, and they describe environments lasting generations or millennia rather than a single season.

The most informative Irish evidence close to this notional date comes from Derryvree near Maguiresbridge in County Fermanagh. There, a 1969 road cutting through a drumlin exposed freshwater silts and fine sands sealed between two sheets of glacial till. Organic material from this deposit produced a conventional radiocarbon determination of 30,500 +1,170/-1,030 years BP. Later calibration places the deposit broadly at about 36,900–31,700 calibrated years BP: approximately 34,950–29,750 BCE when expressed against the conventional 1950 “present” used in radiocarbon dating. That wide interval includes 31,005 BCE, but does not establish the precise appearance of Derryvree, much less all Ireland, in that exact year.

A Wetland Between Ice Advances

Derryvree is important because its organic bed lies between deposits made by ice. It demonstrates that this part of Fermanagh was ice-free long enough for freshwater sediments, plants and small animals to accumulate, before a later ice advance buried the evidence beneath till. The site therefore preserves a local interval of exposed ground within the fluctuating cold of Marine Isotope Stage 3, the long climatic phase preceding the coldest extent of the last glaciation.

The deposits do not show a wooded Ireland. Their pollen, plant macrofossils and insect remains point instead to a cold, largely treeless, periglacial wetland: a patchwork of shallow pools, waterlogged ground, mosses, sedges, grasses and herbs. Recorded plants include species associated with northern or alpine settings, among them mountain-avens and bogbean. Moss remains and aquatic indicators show that this was not simply a dry grassland; standing or slow-moving freshwater and damp organic ground mattered greatly. Sparse dry-land vegetation probably occupied better-drained patches around the pools.

Such a landscape should not be pictured as an unchanging white wilderness. “Tundra” describes an open ecological character, not a uniform scene. Seasonal thaw could create wet hollows, muddy margins and short-lived growth. Summers were cool and brief, while winters were severe. Frost action, snow cover, frozen ground and meltwater would have shaped the terrain. The low productivity of the land placed firm limits on the numbers of large animals it could support, yet wetland plants, insects and sheltered watercourses created small but significant ecological refuges.

Not Yet the Maximum Ice Sheet

At this time Ireland was moving towards, rather than already experiencing everywhere, the greatest extent of the last British–Irish Ice Sheet. Modern reconstructions emphasise that ice growth was neither instantaneous nor uniform. Different sectors of Ireland, Britain and the continental shelf responded differently to climate, topography and the supply of snow. A local freshwater deposit in Fermanagh cannot be transformed into a map of an entirely ice-free island; equally, later widespread glacial landforms must not be projected backwards to make every part of Ireland ice-covered at once.

Derryvree’s position beneath later till gives the regional change particular force. It records living wet ground before ice overrode or approached the area. The later ice sheet would erode, transport and bury vast quantities of older sediment, destroying many possible archaeological and environmental sites. This is one reason Ireland’s evidence for the deeper Palaeolithic is so sparse. Absence of campsites now is not proof that no person ever passed through the wider region, but it does mean that permanent occupation cannot responsibly be asserted.

Sea level was much lower than it is today because large volumes of water were locked in northern ice sheets. The outline of the modern island was therefore not the relevant geography. Exposed shelves and changing coastal plains altered routes between Ireland, Britain and mainland Europe. Yet neither lowered sea level nor animal movement proves a stable, easily crossed land bridge at every moment. Routes could have opened and closed, and the evidence is too incomplete to reconstruct a single reliable journey for 31,005 BCE.

Cork’s Cave Fauna

Another window on this broad period lies far to the south-west at Castlepook Cave, near Doneraile in County Cork, historically called Mammoth Cave. Its collections contain remains of a striking Pleistocene fauna, including woolly mammoth, reindeer, giant deer, brown bear, Arctic fox and spotted hyaena. Revised radiocarbon work has shown that some of the cave material belongs to Marine Isotope Stage 3, before the Last Glacial Maximum. The National Museum of Ireland’s spotted-hyaena skull from the cave is a particularly vivid reminder that Ireland’s animal communities were once unlike those of any later historical age.

These bones illuminate ecological possibility, not a single simultaneous animal community. Cave deposits may accumulate over long periods; bones can be moved by scavengers, water or excavation, and individual specimens have different histories. It would be unsafe to place mammoth, hyaena and reindeer together in one precisely dated Irish scene, or to suppose that Castlepook's fauna inhabited Fermanagh at the same time as the Derryvree wetland. The responsible conclusion is narrower but still remarkable: cold-stage Ireland could intermittently support, or be reached by, large herbivores and formidable carnivores during this wider pre-maximum interval.

Reindeer and mammoth indicate open habitats with substantial grazing or browsing resources across parts of the landscape. Hyaena is evidence of a predator and scavenger capable of exploiting large carcasses and of using caves or sheltered places. Such animals also suggest recurrent ecological connections beyond Ireland, because their populations could not have arisen in isolation. But fossils reveal presence more readily than population size, seasonality or migration route. They cannot tell us whether a herd crossed a particular valley, nor how long any species persisted locally.

The Human Question

There is no securely dated house, hearth, stone-tool assemblage, burial or occupation surface in Ireland that can be assigned to around 31,005 BCE. Consequently, there is no basis for naming an Irish community, describing leaders, territories, warfare, diplomacy, language, ritual or artistic tradition in this period. Nor is there evidence for farming, managed livestock, pottery, metalworking, long-distance exchange or a settled economy. The ordinary political and social categories of a year-by-year history simply do not yet apply.

A reindeer femur from Castlepook has attracted attention because a mark on the bone has been interpreted as possible fresh-bone modification by a stone tool. If ultimately confirmed as a human butchery mark and securely tied to the bone's age, it would be important evidence for a brief Upper Palaeolithic human presence far earlier than Ireland's better-established terminal-Pleistocene evidence. At present, however, one disputed or incompletely contextualised bone cannot demonstrate a camp, a resident population or a human event in this particular calendar-labelled year. Dating the animal and identifying the cause and timing of a surface mark are separate evidential questions.

The earliest published, directly dated Irish evidence widely accepted as humanly modified remains much later: the cut-marked brown-bear patella from Alice and Gwendoline Cave in County Clare, dated to about 12,810–12,590 calibrated BP. That discovery establishes Late Upper Palaeolithic activity after the maximum glaciation, not settlement at Derryvree's much earlier horizon. It also illustrates the value of museum collections, whose reassessment can alter long-held ideas about Ireland's past.

What Can Be Said Responsibly

For the human history of Ireland around 31,005 BCE, the honest account is chiefly one of limits. No known evidence supports a polity, conflict, diplomacy, religion, trade network or enduring settlement. If people entered the Irish landscape during the broader period, they would have been small mobile hunter-gatherer groups operating in a harsh, thinly productive environment; that is an inference from wider north-west European prehistory, not a demonstrated Irish fact. It must not be converted into a story of named bands, camps or ceremonies.

What the evidence does reveal is a country in profound environmental transition. At Derryvree, a cold freshwater tundra wetland flourished for part of an ice-free interval. In Cork, cave deposits preserve traces of a wider cold-stage fauna whose members arrived through changing northern landscapes. Later glacial expansion erased much of the ground on which people or animals might once have left clearer traces. The history of this nominal year is therefore not a dated human episode, but a fragile environmental archive: wetland life, open country, mobile fauna and ice advancing towards a landscape that would soon be transformed.

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31004 BCE

Derryvree's Mosses and Mammoths^[97]



A Date Without a Calendar

“31,004 BCE” is a modern chronological label, not a year that anyone in prehistoric Ireland could have named or recorded. No calendar, settlement sequence or historical event permits precision to a single year at this depth of time. The responsible question is therefore not what happened in Ireland in that exact year, but what evidence can illuminate the broad interval in which it falls.

In calendar terms, 31,004 BCE lies roughly 32,950 years before AD 1950, the conventional reference point for radiocarbon dating. The crucial Irish evidence is the Derryvree freshwater deposit near Maguiresbridge, County Fermanagh. Its organic silts yielded a conventional radiocarbon determination of 30,500 $\pm$ 1,170/–1,030 radiocarbon years BP. Calibration converts radiocarbon measurements into calendar-age ranges rather than exact dates; published discussion places Derryvree broadly at about 36,900–31,700 calibrated years BP, approximately 34,950–29,750 BCE. The numbered year in this article sits inside that range, but cannot be attached to a particular season, animal death, human visit or climatic episode.

This was the later part of Marine Isotope Stage 3, during the Midlandian, Ireland’s last major glacial period. It was before the fullest expansion of the Last Glacial Maximum, when the British–Irish Ice Sheet later occupied much of the island and its surrounding shelves. Conditions were unstable on long timescales: colder phases, episodes of relative amelioration, advancing ice and locally ice-free ground succeeded one another. Ireland at this point was not a timeless white wilderness, nor can it be reconstructed as a uniformly habitable country. Its environments varied sharply by place and changed over centuries and millennia.

Water Between Two Ice Advances

Derryvree is exceptionally important because a road cutting exposed freshwater silts and fine sands trapped between two thick till sheets in a drumlin. Till is debris laid down directly by glacier ice. The sequence shows that ice had affected the locality before the freshwater sediments accumulated, and that a later ice advance sealed them beneath further glacial material. It is firm evidence for a locally ice-free interval in this part of Fermanagh; it is not proof that all Ireland was simultaneously free of ice.

The fossils within those sediments offer the clearest direct picture of an Irish landscape relevant to this date. Pollen was dominated by herbaceous plants, while macrofossils included mosses, sedges and cold-adapted plants such as mountain avens, dwarf willow and bogbean. Beetle and other invertebrate evidence added ecological detail. Together, these remains indicate open, treeless tundra or muskeg: wet, mossy ground with sedge-rich vegetation, shallow pools and patches of drier exposed terrain. Plant cover was sufficient to sustain a living ecosystem, but the climate was harsh, with severe winters and little resemblance to modern wooded Fermanagh.

The word “muskeg” is useful because it prevents an overly simple picture of dry grassland. Derryvree was a watery, organic landscape. Standing or slowly moving freshwater allowed fine sediment, plant remains and small animal evidence to gather. Mosses and sedges occupied wet ground; aquatic plants signal pools or quiet water. Yet this was still an open cold-stage setting, vulnerable to frost action, short growing seasons and sudden environmental change. The deposit preserves an ecological moment, not a map of an entire island.

Its chronology also demonstrates why caution matters. The original radiocarbon result has a substantial uncertainty, and calibration across the older part of the radiocarbon timescale produces broad ranges. More recent Irish cave and speleothem research confirms that climatic conditions in the region could shift markedly during Marine Isotope Stage 3. Crag Cave in County Kerry preserves episodes of calcite growth requiring liquid water and temperatures favourable to it, interspersed with colder intervals when growth stopped. Such records support the view that Ireland’s climate responded to rapid North Atlantic fluctuations, but they do not allow the weather of 31,004 BCE to be specified.

Castlepook’s Animal Archive

Far to the south-west, Castlepook Cave near Doneraile in north County Cork provides a different sort of evidence. Also called Mammoth Cave, it is Ireland’s richest known archive of vertebrate remains from the period leading towards the Last Glacial Maximum. Excavations begun in the early twentieth century recovered more than 2,000 bones from complex limestone passages and chambers. Subsequent radiocarbon work has shown that the assemblage spans a long period, rather than representing one brief occupation or one perfectly contemporaneous animal community.

Its fauna includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyena, with wolf, Arctic fox, lemmings and hares represented among later cold-stage material. These finds establish that, during parts of the wider Ice Age interval, Ireland supported or was visited by large herbivores and formidable carnivores suited to open, cold environments. They make the Derryvree tundra tangible: reindeer and mammoth were not imagined additions to an Irish Ice Age scene, but animals known from the fossil record.

There are important limits. Cave deposits are not ordinary settlements and are often mixtures created by carnivores, water movement, natural deaths, excavation practices and later disturbance. The Castlepook bones have dates ranging across many thousands of years. It would be misleading to place

every recorded species together in a single landscape in 31,004 BCE, or to assume that a mammoth bone, a hyena skull and a reindeer femur document one encounter. What the cave securely supplies is a long, uneven record of fauna in southern Ireland during a changing glacial world.

Spotted hyenas deserve particular attention. Their presence at Castlepook is evidence not only of a carnivore but of processes of accumulation. Hyenas may have carried or modified bones; other remains may have entered through water or collapsed sediment. The cave is therefore a record of animal movement, predation, scavenging and geological sorting. It is not a royal hunting lodge, a battlefield or a human village. The surviving evidence is richer in animals than in people.

The Human Question

The most provocative object associated with this broad horizon is a reindeer femur from Castlepook reported to bear a deep mark interpreted as having been made by a sharp stone tool during butchery. County Cork heritage material dates the specimen to about 31,000 BCE and presents it as potentially very early evidence of human handling of an animal in Ireland. If the mark is anthropogenic and contemporary with the fresh bone, it would indicate that at least one Upper Palaeolithic person, or a small travelling group, may have processed a reindeer in Ireland long before the final retreat of the last ice sheet.

That is an important possibility, not a licence to invent a settled Palaeolithic population. A radiocarbon measurement dates the animal bone, not automatically the instant at which a mark was made. Nor has a securely associated hearth, stone-tool assemblage, dwelling floor, burial, food store or repeatedly occupied camp of this age been established at Castlepook. The cave's complicated collection history and sedimentary disturbance demand restraint. The femur can support discussion of a possible human action; it cannot establish a village, a migration route, a population size or a continuous occupation of Ireland.

Consequently, political affairs, conflict, diplomacy, religion, named leaders and formal institutions are beyond recovery for this date. There is no evidence for tribes, territories, alliances or ceremonial places in Ireland around 31,004 BCE. Nor is there evidence for trade in the usual archaeological sense. If people were present, their material world has not yet been recovered in an assemblage capable of describing their tools, social organisation, beliefs or exchange networks. Silence in the record does not prove that none existed, but it does set strict limits on historical reconstruction.

Connections and Approaching Ice

The animal record nevertheless shows that Ireland was not ecologically isolated in every phase of the Ice Age. Mammals reached the island during periods when changing sea levels, ice margins and exposed continental shelves allowed movement from neighbouring lands. Exactly how particular species travelled cannot simply be read from a cave bone, and the geography altered repeatedly. The safest conclusion is connectivity: reindeer, hyenas and other mammals found routes into Ireland during suitable intervals, demonstrating that its fauna formed part of the wider north-west European world.

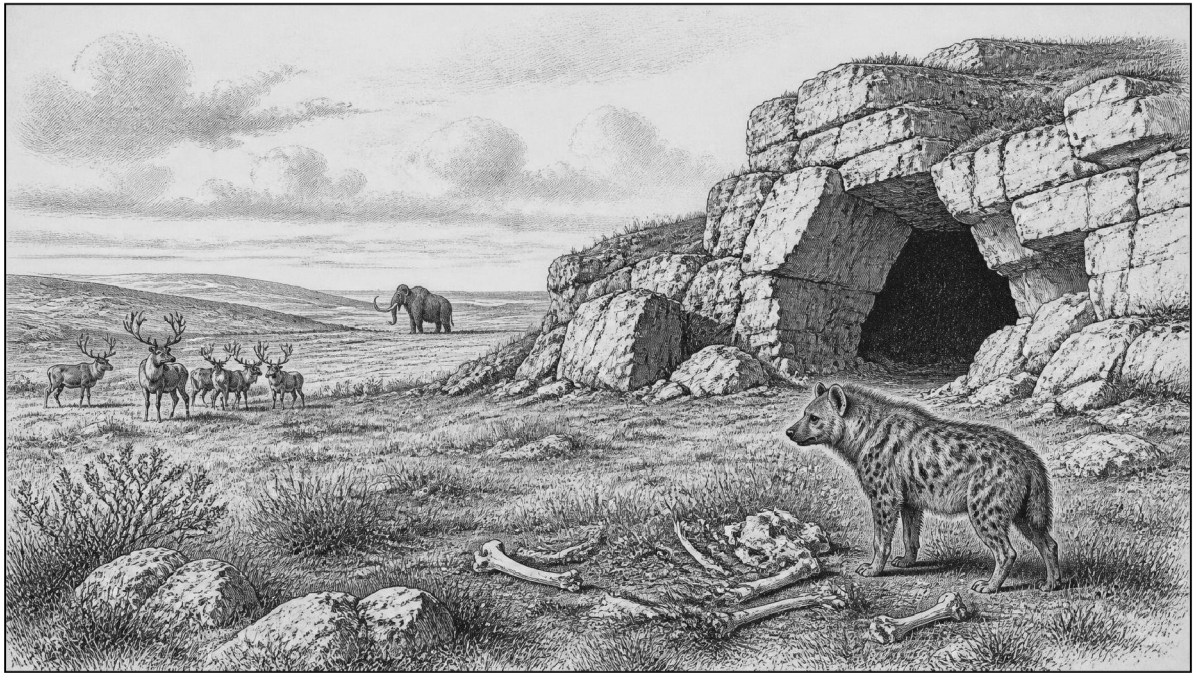
At the same time, the future held severe disruption. Large-scale reconstructions of the British–Irish Ice Sheet show major growth after this general interval and eventual ice expansion across Ireland and offshore shelves. Derryvree's upper till is local testimony to renewed glaciation. Later ice erosion and deposition destroyed or buried many older landscapes, helping to explain why evidence for human activity before the Last Glacial Maximum is so sparse.

A careful portrait of Ireland around this point is therefore one of regional evidence rather than national certainty: wet tundra pools and mosses beneath the later drumlins of Fermanagh; cave passages in Cork collecting bones from a cold-adapted fauna; climate fluctuating on scales far longer than a human year; and perhaps, but not demonstrably, a fleeting human encounter with a reindeer. The history is not empty. It is simply geological, ecological and fragmentary—and it must remain more precise about its evidence than about its stories.

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31003 BCE

Castlepook's Thirty-Three-Millennia Fauna^[98]



The label 31,003 BCE is useful only as a modern filing point. No event in Ireland can be assigned to that exact calendar year, and no person, settlement or political episode can responsibly be placed within it. At this depth of time, chronology comes from radiocarbon measurements, geological sequences and comparison with wider climatic records; each has margins of uncertainty. The best approach is therefore to examine Ireland in the broad interval around 33,000 radiocarbon years before present, within Marine Isotope Stage 3, while distinguishing that laboratory timescale from calibrated calendar ages. The period was long before the Last Glacial Maximum, but it belonged unmistakably to the last Ice Age.

For Ireland, the outstanding evidence is not a village, graveyard or tool-making floor. It is a scattered record of animal bones, cave sediments, landforms and environmental deposits. Together they show an island—or, more accurately, a western peninsula within a much lower-sea-level north-west European landscape—whose climate, coastlines and living communities differed profoundly from those of modern Ireland. They do not provide a continuous national story. They instead preserve brief, uneven glimpses of a cold-world frontier.

Dating a Calendarless World

Radiocarbon years are conventionally counted from 1950, not from the present calendar. Nor are they identical to calendar years: changes in atmospheric carbon mean that a radiocarbon determination must be calibrated against an internationally maintained curve. Around 33,000 radiocarbon years before present, calibration can produce broad and sometimes irregular calendar ranges rather than a single equivalent

date. Consequently, it is safer to speak of a later Marine Isotope Stage 3 setting, broadly in the tens of thousands of years before the global ice maximum, than to treat 31,003 BCE as an archaeological timestamp.

This caution matters particularly at Castlepook Cave, near Doneraile in north County Cork. The cave is Ireland's richest known repository of vertebrate remains dating to the interval before and around the approach to the Last Glacial Maximum. More than 2,000 bones have been recovered through antiquarian excavation and later investigation. Direct radiocarbon dating has shown that the assemblage spans a considerable length of time, rather than representing one moment or one neatly bounded animal community. Individual bones document repeated deposits between roughly 45,700 and 19,950 radiocarbon years before present. A bone dated from the cave tells us when that animal died, not automatically when a different animal entered, when a carnivore used the cave, or when a human may have handled a carcass.

A Cold, Open Ireland

Ireland around this broad horizon was part of the Late Pleistocene cold stage. It was not simply the modern island covered in snow. The British–Irish Ice Sheet had a complicated history of growth, advance and fluctuation, and its precise pre-maximum extent remains debated. Research does, however, agree that the continental-scale maximum came later, principally between about 27,000 and 21,000 years ago. At the time represented by the older Castlepook fauna, substantial areas of Ireland could support grazing animals and predators, even as the climate was colder, more variable and generally more continental than today.

Sea level was much lower than now because immense quantities of water were held in northern ice sheets. The seas around Ireland did not have their modern outlines: broad shelves were exposed, rivers crossed landscapes now submerged, and the distance to Britain and continental Europe was reduced. Lower sea level did not mean that every route was a simple, dry land bridge at every moment. Ice margins, channels, estuaries and changing coastal terrain created shifting obstacles. Nonetheless, Ireland was less isolated geographically than it later became after post-glacial sea-level rise drowned the surrounding lowlands.

Vegetation evidence from Ireland is fragmentary for this exact interval, and it must not be stretched beyond what it can bear. The animal assemblage, however, supports the picture of an open, cold-adapted landscape: mosaics of grassland, herb-rich steppe, sparse shrub vegetation, exposed ground and wet hollows rather than a closed, oak-rich woodland. Such terrain could feed large herbivores, though it was seasonally severe and vulnerable to abrupt climatic change. Caves, sheltered slopes, river corridors and wetland margins would have mattered disproportionately within an otherwise exposed country.

Castlepook's Mammal Community

The fauna from Castlepook provides the clearest Irish evidence for this landscape. It includes woolly mammoth, giant deer, reindeer, brown bear and spotted hyaena, with later or differently dated cave material also including foxes, wolves, mountain hare and lemmings. These species should not be imagined standing together in a single Ice Age tableau. The cave deposits accumulated over thousands of years, and water movement, carnivore activity, earlier disturbance and old excavation methods complicate their context. Yet the combined record securely establishes that Ireland could support a far more varied Pleistocene mammal fauna than the island's modern terrestrial fauna suggests.

Reindeer indicate cold, open country with extensive forage and, potentially, seasonal movement across broad landscapes. Mammoths and giant deer point to substantial grazing and browsing resources. Brown bears may have used caves intermittently, while wolves and spotted hyaenas were active predators and scavengers. Hyaenas are especially important because their use of caves can explain why bones entered and accumulated underground: they carried carcass parts, gnawed bones and left remains where humans might also later have sheltered or passed. Castlepook is therefore not an ordinary hunting camp. It is a complex natural archive shaped by animals, water, geology and excavators.

That distinction changes how everyday life can be discussed. There is no demonstrated resident human population for Ireland at this date. No securely associated house, hearth, stone-tool assemblage, burial, midden or repeatedly occupied camp has been published from Castlepook's Marine Isotope Stage 3 horizon. It follows that there is no evidence for Irish political institutions, diplomacy, communal territories, ritual practices, language, farming, domestic animals, pottery, metalworking, trade networks or formal learning. Those categories belong to much later Irish prehistory and cannot be projected backwards merely because people elsewhere in Upper Palaeolithic Europe practised varied forms of social life.

The Reindeer Femur Question

One object makes this period unusually significant for Irish archaeology: a reindeer femur from Castlepook reported to bear a deep linear mark interpreted as having been made by a sharp stone tool while the bone was fresh. Public heritage accounts have connected the specimen with an age of about 33,000 years and with the possibility of reindeer butchery. If the interpretation of the mark as anthropogenic, and its association with the dated animal, are confirmed, it would be Ireland's earliest known indication that an Upper Palaeolithic person processed an animal on the island.

The conditional language is essential. A single mark is not equivalent to a settled population. It cannot establish how many people arrived, where they came from, whether they crossed in one expedition or repeatedly, how long they stayed, or whether they left descendants. The cave's deposits are not a sealed occupation layer, and old collections often lack the precise stratigraphic records expected today. Carnivore damage, sediment movement and damage from excavation all have to be considered when interpreting a modified bone. The specimen is best understood as an important and testable claim, not as a licence to populate Ice Age Ireland with permanent communities.

Even so, the possibility is historically meaningful. Across western Europe, people of the Upper Palaeolithic were highly mobile hunter-gatherers who used stone tools, fire, hides, social knowledge and seasonal movement to live through difficult climates. The Castlepook femur does not demonstrate that such a community occupied Ireland, but it leaves open the possibility of a brief visit, an opportunistic hunt or the processing of a found carcass. In a landscape later reshaped by ice, rising seas and erosion, a light and short-lived human presence would be exceptionally difficult to detect.

Landscape Without States

In this setting, the most consequential 'regional change' was environmental. Ireland's inhabitable zones could expand or contract as temperatures, precipitation, vegetation and ice margins altered. Animals capable of moving through open country could arrive during favourable phases and disappear when conditions deteriorated. The record suggests colonisation and local loss rather than stable continuity. Giant deer and spotted hyaena, for example, appear to have been absent from Ireland by the time of the Last Glacial Maximum, while later recolonising faunas were more restricted.

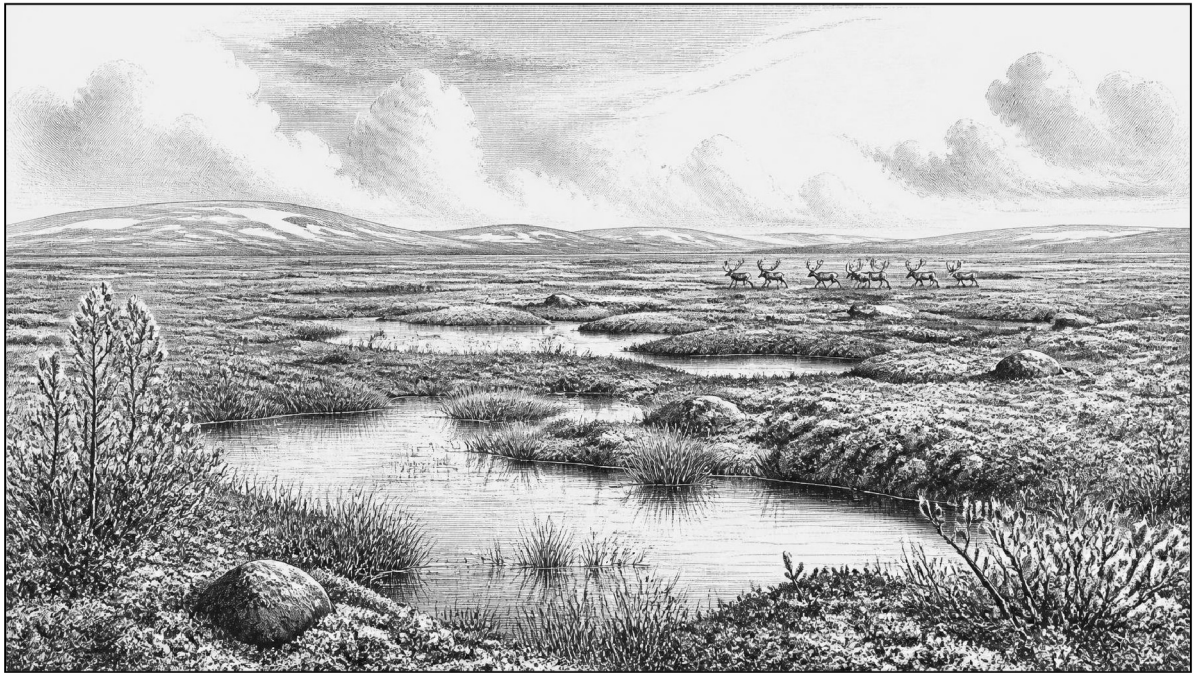
There was no Irish economy in the later sense, but herbivore movements and scavenging opportunities structured the energy available to any animal—and perhaps any occasional human—on the landscape. Reindeer meat, marrow, hide, sinew, antler and bone would have been valuable resources to Upper Palaeolithic hunters if they were present. This is a reasonable inference from wider European evidence, not a fact demonstrated at Castlepook. Likewise, a cave may have offered temporary shelter, but its principal demonstrated role is as a repository of faunal remains, partly formed through carnivore behaviour.

Thus the Ireland of this notional year was not yet a society with rulers, monuments or named peoples. It was a changing Ice Age environment inhabited by large mammals and predators, with Castlepook Cave preserving the strongest evidence. Its reindeer femur offers a provocative possible human trace, while the wider faunal archive provides firmer ground: a cold, open and biologically richer Ireland, poised before the far harsher expansion of the ice sheet that would later transform much of the island.

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31002 BCE

Hyena Hall's Open Country^[99]



“31,002 BCE” is a modern label for a point deep in the Late Pleistocene, not a year that can be recovered from an Irish calendar. No written record, named individual, political event or securely dated human settlement belongs to this precise year. The evidence works at a much broader scale: radiocarbon determinations with substantial uncertainty, calibrated ranges, cave deposits, fossil bones, pollen and plant macrofossils, and the landforms left by moving ice. In calendar terms, the label falls roughly 32,950 years before AD 1950, but that arithmetic conversion must not be confused with a calibrated archaeological date.

The relevant period is the later part of Marine Isotope Stage 3, within the Irish Middle Midlandian cold stage and close to the large-scale growth of the last British–Irish Ice Sheet. It was a world of abrupt climatic shifts rather than a single unchanging “Ice Age”. Ireland was not uniformly buried beneath ice at every moment. Crucially, however, evidence from one locality cannot be made to stand for the whole island. Around this notional date, Ireland is best understood as a changing north-western European landscape in which open ground, wetlands, animals and advancing ice shaped the possibilities for any human visitor.

A Date Measured in Ranges

The most illuminating environmental sequence is at Derryvree, near Maguiresbridge in County Fermanagh. In 1969, road works cut through a drumlin and exposed freshwater silts and fine sands lying between two substantial layers of till, sediment deposited directly by glacier ice. The sequence shows that ice had occupied the locality, that a later ice-free interval allowed freshwater sediments and organic

material to accumulate, and that renewed glaciation subsequently sealed them beneath another till sheet. It is powerful evidence for environmental change, but it does not identify what happened at Derryvree in any particular calendar year.

Organic material from the freshwater deposit returned a conventional radiocarbon determination of $30,500 \pm c.1,100$ radiocarbon years BP. Such a result is not the same thing as a calendar age: radiocarbon years must be calibrated against changing atmospheric carbon-14 levels, and the uncertainty is considerable at this depth of time. The deposit has therefore been used responsibly to place an ice-free, periglacial episode in south Fermanagh broadly within late MIS 3, rather than to pin it to 31,002 BCE. More recent ice-sheet modelling similarly treats Derryvree as a constraint on the timing of ice expansion, not as a dated historical episode.

Wet Ground Beneath a Cold Sky

Derryvree preserves a rare glimpse of an Irish cold-stage ecosystem. Its pollen was poorly preserved, yet was predominantly herbaceous. Mosses and other plant macrofossils included taxa associated with tundra and wet habitats; bogbean, sedges, mountain-avens, dwarf willow and clubmoss are among the plants reported from the sequence. These remains support an interpretation of treeless, open vegetation with freshwater pools, marshy ground and sparse dry-land cover. They do not prove a continuous carpet of the same vegetation across Ireland, nor do they recreate a picturesque, stable tundra. The landscape would have been patchy, seasonally exacting and altered by frost, waterlogging, snow cover and changing temperatures.

That environmental setting matters because it defines everyday survival for animals and any people who may have entered the island. There is no evidence here for farms, cleared fields, domestic livestock, pottery, metalworking or permanent villages. Woodlands of the kind familiar from later prehistoric Ireland had not developed. Fuel, shelter material and edible plants would have been scarce and unevenly distributed. Fresh water was available locally, but living beside it was not necessarily easy: freezing conditions, exposure and unstable ground could make a wetland as much an obstacle as a resource.

The broader glacial history reinforces the need for caution. The last British–Irish Ice Sheet expanded substantially after this phase and reached its greatest overall extent at different times in different sectors, rather than in one simultaneous island-wide event. Reconstructions indicate major ice growth across the wider Irish and British region from about 31,000 years ago, with extensive shelf-edge glaciation later, around 27,000–26,000 years ago. Thus 31,002 BCE belongs to an interval of growing climatic severity and changing ice margins, not necessarily to a moment when every part of Ireland was engulfed by ice.

Castlepook and the Animal Record

In north Cork, Castlepook Cave near Doneraile—also called Mammoth Cave—provides Ireland's most important archive of mammal remains from before the Last Glacial Maximum. Its evocatively named chambers, including Hyena Hall and Elephant Hall, produced bones of woolly mammoth, reindeer, giant deer, brown bear, wolf, foxes, Arctic fox, lemmings and spotted hyena. Taken together, the fauna indicates repeated ecological links with the wider European landmass and an open, cold environment capable of supporting large herbivores and their predators or scavengers.

Yet Castlepook is not a neatly preserved snapshot of one day or one community. Early excavations removed large quantities of material; water movement and later disturbance complicated the deposits; and bones accumulated through more than one process. Hyenas could drag carcass parts into caves, gnaw

bones and leave droppings. Animals could die naturally, and water could move remains from one place to another. Radiocarbon programmes have shown that the Irish cave fauna spans long intervals, while later reassessment has stressed the limitations of some older determinations. A mammoth, a reindeer and a hyena found in the same cave do not automatically prove that they met at the same time.

Nevertheless, Castlepook makes one central point secure: late Pleistocene Ireland supported a much richer large-mammal fauna than the modern island. Reindeer imply grazing or browsing opportunities over open terrain; mammoths and giant deer point to substantial available forage, though their precise local population sizes cannot be calculated from scattered bones. Hyenas reveal a food web in which carcasses were contested and caves could be dens or scavenging places. The term “Irish elk”, often used for giant deer, is misleading: the animal was neither uniquely Irish nor an elk, although Irish deposits later became famous for its spectacular antlers.

The Reindeer Bone Question

Castlepook also bears on the most difficult question of all: were people in Ireland around this broad period? A reindeer femur in the National Museum of Ireland collection has been presented in Cork heritage material as dating to about 31,000 BC and as carrying a deep mark interpreted as a fresh-bone cut or chopping mark made with a sharp stone implement. If that interpretation and association are upheld, it may record human handling of a reindeer far earlier than the previously recognised terminal-Pleistocene evidence from Alice and Gwendoline Cave in County Clare.

The proper conclusion remains deliberately limited. One marked animal bone is not proof of a resident population, a hunting camp or a migration route. Castlepook has produced no securely associated hearth, stone-tool assemblage, habitation floor, burial, repeated refuse deposit or human bone of this age. The bone’s date is the date of the animal’s death, while identifying a surface modification as a human tool mark is a separate taphonomic judgement. It cannot tell us whether a person killed the reindeer, scavenged it, removed meat, hide or sinew, or encountered it elsewhere before the bone reached the cave. The most that can be said is that it is a significant possible trace of human activity, demanding further scientific testing and contextual excavation.

No Kingdoms, No Frontiers

Political affairs, diplomacy and organised warfare cannot responsibly be reconstructed for Ireland at this date. There were no known kingdoms, borders, chiefs, treaties or institutions, and no evidence for a settled Irish population from which such structures might be inferred. Nor can language, kinship rules, religious belief, art or formal learning be recovered from the Derryvree sediments or the Castlepook bones. To invent them would turn a thin archaeological record into fiction.

If people did reach Ireland, they were likely mobile foragers operating within a much wider north-west European world, but even that is an inference from the ecological setting and contemporary human presence elsewhere, not a demonstrated Irish society. Travel itself is unresolved. Lower sea levels altered coastlines, but water, ice and changing channels still made access contingent; there is no excavated boat, route or shore camp. “Trade” in the later sense is equally unsupported. The only exchange plainly visible is ecological: animals and perhaps occasional people moving when terrain, climate and food allowed.

The history of Ireland around 31,002 BCE is therefore not a story of rulers or monuments. It is the story of a cold, open country in transition: freshwater tundra wetlands at Derryvree, a formidable mammal community recorded at Castlepook, and a possible human cut mark whose importance lies precisely in its

uncertainty. As the ice sheet built towards its later maximum, such habitats and corridors would have narrowed, shifted or vanished. What survives is fragmentary, but it is enough to show that the deep past of Ireland was environmentally dynamic, biologically diverse and far less empty than older accounts once suggested.

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31001 BCE

Derryvree's Intertill Garden^[100]



“31,001 BCE” is a useful modern label, not a date that can be recovered from Ireland’s archaeological record with calendar-year precision. No event, journey, birth or settlement can responsibly be assigned to that year. The evidence instead belongs to a broad Late Pleistocene interval, within Marine Isotope Stage 3, when climate repeatedly shifted between relatively milder interstadial episodes and severe cold. The best Irish record relevant to this notional date is an ancient freshwater deposit at Derryvree, near Maguiresbridge in County Fermanagh. Its radiocarbon result of $30,500 \pm c.1,100$ radiocarbon years before present calibrates broadly to about 36,900–31,700 calibrated years before present. Thus 31,001 BCE falls within the possible span of this environmental archive, but not at a detectable point within it.

A Landscape Between Ice Advances

Derryvree was exposed during roadworks in 1969, when a cutting through a drumlin revealed an unusual sequence. Glacial till lay below, freshwater silts and fine sands in the middle, and another till above. Till is the unsorted sediment left by glacier ice. The sequence therefore records a local history in three parts: ice had previously crossed the ground; a period followed in which open water and wetland sediment could accumulate; then ice returned or expanded over the locality. It is one of Ireland’s rare surviving records of an ice-free or less heavily glaciated interval during the later Ice Age.

This is crucial context for 31,001 BCE. Ireland was not a stable island with familiar coastlines, woodland and settled communities. Sea level was much lower than today because enormous quantities of water were held in northern ice sheets. The modern Irish Sea basin and surrounding shelves were different landscapes, while the degree and timing of land connections between Ireland, Britain and continental

Europe varied through the glacial cycle. Yet lower sea level did not automatically make every route easy: cold seas, shifting ice margins, exposed plains, rivers and periglacial ground formed formidable barriers as well as potential corridors.

At the scale of the British–Irish Ice Sheet, recent reconstructions place this period at the beginning of major ice-sheet growth, from about 31,000 years ago. They reconstruct ice accumulation in the north-west of Ireland, particularly around the Derryveagh and Sperrin uplands, alongside mountain glaciers and icefields elsewhere. This is a model-based regional picture, constrained by landforms, sediments and dates; it should not be converted into a claim that every Irish valley or county was ice-covered in a particular year. Derryvree itself shows why local sequences matter. Its buried wetland demonstrates that conditions could differ markedly through time and place before the ice sheet reached its later maximum extent.

What Grew Around the Water

The Derryvree silts preserve pollen, plant macrofossils, mosses and insect remains. Their combined evidence points to a cold, open, periglacial landscape rather than forest. Herbaceous plants dominate the pollen record. Mosses and the remains of plants associated with tundra, sedge-rich ground and shallow freshwater indicate damp hollows, pools and marshy margins. Among the notable finds is bogbean, a three-leaved wetland plant, alongside water-milfoil and other aquatic or waterside species. Mountain avens, dwarf willow, clubmosses and sedges help to evoke exposed ground where vegetation could survive a rigorous climate.

This was not necessarily a uniform blanket of “tundra”. Plant communities respond to drainage, snow cover, soil disturbance, slope and exposure. A shallow pool could support aquatic plants while nearby ridges carried sparse herbs and mosses; wetter ground might have held sedges and dwarf shrubs. The few grains of tree pollen in the record do not demonstrate local woodland. They may have travelled long distances, been redeposited, or represent only very scattered trees beyond the immediate basin. The sound conclusion is a largely treeless, cold mosaic of wetland and open ground, not a precise reconstruction of every hillside.

Seasonality would have organised life in this environment. Short growing seasons, frost action and prolonged winter darkness limited plant productivity. In summer, however, wetlands could have produced a concentrated flush of vegetation and attracted grazing animals. Meltwater and standing water also shaped the ground, while repeated freezing and thawing moved soils, cracked surfaces and altered drainage. The landscape that Derryvree records was alive, but it was not benign or predictable.

Animals in an Open Country

Irish cave deposits provide a complementary, though imperfect, glimpse of the larger animal world. Castlepook Cave near Doneraile, County Cork, has yielded remains attributed to reindeer, woolly mammoth, giant deer, brown bear, wolf, fox, Arctic fox, lemmings and spotted hyaena. Not all of those animals need have been present together, and cave sediments were disturbed by earlier excavations and natural processes. Nevertheless, the fauna shows that parts of Ireland supported a varied cold-stage mammal community during the wider period between roughly 45,000 and 20,000 years ago.

Reindeer are especially informative. They are adapted to cold, open terrain and their presence accords with the treeless vegetation inferred at Derryvree. Mammoth and giant deer likewise suggest that, at least in some phases and places, there was sufficient forage and accessible terrain for large herbivores.

Predators and scavengers complicate any simple picture of a peaceful grazing landscape. Wolves and hyaenas could exploit carcasses and hunt vulnerable animals; caves may have served as dens, shelters or traps rather than human homes. Animal bones in caves therefore record mortality, scavenging, transport and geological disturbance as much as they record a living community.

The most arresting find from Castlepook is a reindeer femur reported to carry a deep mark interpreted as a stone-tool cut or chop mark. Modern radiocarbon work has placed the bone broadly around 33,000 years ago, making it potentially relevant to the era represented by 31,001 BCE. If the mark was made during carcass processing by people, it would be extraordinarily early evidence of human activity in Ireland. But the distinction matters: the dated bone proves that a reindeer lived and died in the relevant broad period; the identification of the mark as human-made is a separate taphonomic interpretation. No associated hearth, stone-tool assemblage, dwelling, burial or repeated occupation surface has yet been securely demonstrated at this age.

People: A Possibility, Not a Population

Accordingly, Ireland around this date cannot be described as a settled human country. There is no evidence for villages, cultivated fields, domestic animals, pottery, metalworking, monuments, writing, named groups, leaders or institutions. There can be no responsible account of Irish political affairs, diplomacy, formal warfare or religion for this year. Such categories depend on evidence that does not exist here.

The Castlepook bone permits a narrower possibility: small groups of Upper Palaeolithic hunter-gatherers may have reached, crossed or briefly visited parts of Ireland during a relatively accessible climatic window. If so, their movements would have been shaped by animal migrations, shelter, fresh water, raw materials and weather rather than by borders. They may have travelled seasonally and left little trace. A single processed carcass would not establish permanent residence, population size, language, social identity or a durable community. Equally, the scarcity of evidence is not proof that no person ever entered Ireland; glaciation, erosion, rising seas and antiquarian excavation have removed or obscured many possible sites.

The more secure evidence for humans in Ireland comes much later, after the Last Glacial Maximum, with Late Upper Palaeolithic traces in County Clare and then Early Mesolithic settlement. That chronological gap is historically important. Any people represented by a possible Castlepook butchery episode cannot presently be connected genealogically, culturally or politically to Ireland's later Mesolithic inhabitants, much less to later Irish populations. Around 31,001 BCE, the human story is a hypothesis at the extreme edge of the evidence, while the environmental story is much stronger.

Economy, Culture and Knowledge

There is no direct evidence for an Irish economy in the usual historical sense. The Derryvree plants and Castlepook fauna indicate ecological resources, not markets or trade. For any transient foragers, meat, hides, sinew, bone, antler and fat would have been valuable resources, as they were among Upper Palaeolithic communities elsewhere in Europe. But it would be an inference, not Irish evidence, to claim that these resources were certainly used at Derryvree or Castlepook. No securely contemporary tools, ornaments, pigments, art or structures allow a local cultural reconstruction.

Nor is there evidence for formal learning or religious practice. People capable of reaching Ireland, if they did, would have possessed skills transmitted through social learning: knowledge of animals, stone, weather, routes and survival in cold conditions. That general proposition cannot identify their beliefs or customs. It is better to recognise the limits of the archive than to fill the silence with later Celtic, medieval or modern ideas of Irishness.

An Environmental History Before History

The significance of 31,001 BCE lies in this tension between possibility and proof. Derryvree reveals a cold freshwater world briefly preserved between glacial advances: mossy margins, sedges, aquatic plants and sparse open vegetation in south Fermanagh. Castlepook preserves a fragmentary faunal archive from a broader cold-stage Ireland, including reindeer and formidable carnivores. Together, they show that the island was neither timelessly frozen nor recognisably habitable in the modern sense. It was changing rapidly, with ecological opportunities appearing and disappearing as climate and ice altered the land.

For this date, then, Ireland has no annals and no calendar. It has silts under a drumlin, bones from caves, radiocarbon ranges, pollen grains, plant remains and competing scientific interpretations. These are enough to recover an ancient landscape in outline: open, wet in places, cold, biologically active and increasingly vulnerable to renewed ice-sheet growth. They are not enough to narrate one year. That restraint is not a failure of history; it is the essential discipline required by deep time.



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 — Maguirebridge's Buried Sedgebed (31100 BCE). Sources: References 1, 12, 22–23, 25, 49, 79, 102, 123, 134, 145, 164, 186, 193, 199, 205, 222, 238, 323, 331, 344, 350, 356, 368.
2. Chapter 002 — Reindeer Bone, Drumlin Silt (31099 BCE). Sources: References 1, 13, 29, 82, 86, 103, 115, 134, 162, 167, 194, 199, 205, 231, 323, 331, 338, 345, 356, 368.
3. Chapter 003 — Derryvree's Dwarf-Willow Wetland (31098 BCE). Sources: References 12, 22, 26, 30, 43–44, 46–47, 62, 102, 104, 124–125, 134, 153, 162, 205, 210, 226, 292, 303, 323, 332, 369.
4. Chapter 004 — Cork's Marked Reindeer Bone (31097 BCE). Sources: References 1, 13, 25, 66, 77, 79, 103, 123, 134, 168, 173, 205, 209, 226, 282, 308, 331, 356–357, 363.
5. Chapter 005 — Maguiresbridge's Frozen Reedland (31096 BCE). Sources: References 1, 13, 25, 63, 100, 103, 123, 135, 182, 200, 205, 209, 222, 226, 323, 330, 344, 356–357, 368.
6. Chapter 006 — Derryvree's Mountain-Avens Basin (31095 BCE). Sources: References 11, 13, 19, 22, 67, 69, 92, 123, 137, 148, 162, 180, 226, 232, 243, 247, 293, 323, 347, 358, 361, 369, 376.
7. Chapter 007 — Maguirebridge's Water-Milfoil Silt (31094 BCE). Sources: References 1, 13, 25, 43, 47, 77, 92, 100, 114, 142, 153, 174, 196, 205, 226, 235, 294, 303, 323, 333, 356, 368.
8. Chapter 008 — The Derryvree Bogbean Lens (31093 BCE). Sources: References 1, 13, 25, 43–44, 47, 69, 92, 123, 134, 159, 162, 182, 196, 205, 226, 240, 293, 323, 334, 347, 356.
9. Chapter 009 — Derryvree's Interstadial Muskeg (31092 BCE). Sources: References 13, 25, 79, 90, 123, 134, 147, 159, 184, 205, 226, 230, 251, 290, 308, 323, 331, 347, 356, 368.
10. Chapter 010 — The Castlepook Butchery Claim (31091 BCE). Sources: References 1, 13, 22–23, 25, 48, 67, 125, 134, 162, 182, 204, 209, 232, 236, 243, 295, 315, 333, 347, 356, 368.
11. Chapter 011 — The Fermanagh Pool Mosaic (31090 BCE). Sources: References 1, 22–24, 27, 124, 134, 145, 159, 162, 186, 199, 205, 232, 288, 293, 301, 309, 323, 356, 369, 374.
12. Chapter 012 — Mammoth Cave's Unsettled Reindeer (31089 BCE). Sources: References 9, 13, 25, 47, 60, 66, 73, 103, 126, 153, 205, 209, 236, 282, 315, 323, 331, 347, 350, 356.
13. Chapter 013 — Derryvree's Buried Tundra (31088 BCE). Sources: References 13, 26, 43, 47, 49, 77, 87, 102, 104, 134, 153, 205, 209, 226, 228, 244, 251, 281, 303, 315, 332, 340.
14. Chapter 014 — Hyaena Hall's Last Passage (31087 BCE). Sources: References 19, 51, 67, 104, 118, 134, 153, 157, 199, 205, 209, 232, 241, 257, 276, 283, 304, 315, 333, 347.
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19. Chapter 019 — Castlepook's Reindeer Crossing (31082 BCE). Sources: References 12, 27, 47, 77, 80, 125, 134, 145, 153, 186, 193, 199, 205, 216, 218, 226, 240, 291, 318, 332, 347, 369.
20. Chapter 020 — Derryvree's Living Silt (31081 BCE). Sources: References 1, 13, 25, 63, 72, 92, 100, 104, 123, 134, 205, 226, 262, 282, 303, 308, 323, 331, 350, 356.

- 21.** Chapter 021 — BIRM-166's Reindeer Question (31080 BCE). Sources: References 26, 33, 43–44, 69, 116, 123, 134, 169, 182, 196, 205, 209, 236, 240, 308, 318, 323, 329, 333, 344, 369.
- 22.** Chapter 022 — Derryvree's Interrupted Waters (31079 BCE). Sources: References 1, 3, 13, 24–25, 47–48, 68, 115, 123, 134, 145, 182, 205, 295, 308, 321, 323, 331, 356, 363, 368.
- 23.** Chapter 023 — Castlepook's Pre-Maximum Fauna (31078 BCE). Sources: References 1, 12, 32, 62, 67, 76, 78, 98, 105, 115, 163, 170, 205, 226, 236, 261, 293, 303, 323, 333, 354, 356.
- 24.** Chapter 024 — BIRM-166 Under Ice (31077 BCE). Sources: References 1, 5, 12, 22, 27, 54, 66, 77, 87, 134, 144–145, 159, 162, 170, 176, 193, 205, 217, 226, 239, 296, 342, 356.
- 25.** Chapter 025 — Derryvree Roadcut Archive (31076 BCE). Sources: References 12, 27, 36, 40, 43, 67, 80, 123, 134, 150, 159, 184, 205, 250–251, 273, 304, 324, 333, 351, 356.
- 26.** Chapter 026 — Derryvree's Trifoliate Pool (31075 BCE). Sources: References 1, 12, 27, 37, 43, 47, 57, 69, 81, 122–123, 134, 166, 182, 205, 222, 289, 323, 332, 356.
- 27.** Chapter 027 — Maguirebridge's Vanished Fen (31074 BCE). Sources: References 12, 27, 55, 74, 102, 123, 134, 145, 154, 199, 205, 222, 226, 273, 323, 330, 332, 344, 353, 356, 369, 372.
- 28.** Chapter 028 — Derryvree's Moss-Rich Mud (31073 BCE). Sources: References 27, 68, 90, 105, 162, 175, 205, 219, 226, 228, 249, 295, 305, 323, 328, 332, 352, 356, 364, 369.
- 29.** Chapter 029 — Castlepook Femur Under Scrutiny (31072 BCE). Sources: References 12, 22, 25, 41, 47–48, 55, 72, 103, 105, 123, 134, 145, 162, 205, 226, 303, 308, 323, 331, 347, 364.
- 30.** Chapter 030 — Derryvree's Clubmoss Silt (31071 BCE). Sources: References 1, 13, 23, 25, 77, 88, 106, 114, 125, 134, 149, 157, 159, 175, 193, 205, 302, 308, 323, 333, 356, 368.
- 31.** Chapter 031 — Castlepook's Faunal Borderland (31070 BCE). Sources: References 23, 42, 60, 84, 126, 134, 144–145, 159, 162, 179, 209, 213, 242, 251, 264, 294, 332, 336, 351, 356.
- 32.** Chapter 032 — Derryvree's Fossil Plant Census (31069 BCE). Sources: References 1, 13, 43–44, 47, 69, 77, 101, 121, 126, 134, 155, 187, 196, 209, 226, 321, 323, 331, 336, 349, 368.
- 33.** Chapter 033 — BIRM-166's Tundra Ledger (31068 BCE). Sources: References 10, 13, 25, 41, 63, 68, 72, 77, 119, 123, 134, 145, 162, 205, 214, 226, 293, 323, 332, 347, 350, 356, 368.
- 34.** Chapter 034 — Derryvree Intertill Sequence (31067 BCE). Sources: References 12–13, 23, 47, 66, 79–80, 123, 125, 143, 159, 182, 226, 269–270, 280, 310, 323, 328, 331–332, 346, 363, 368, 372.
- 35.** Chapter 035 — The Maguiresbridge Interlude (31066 BCE). Sources: References 1, 18–19, 47, 80, 103, 123, 136, 158, 205, 226, 292, 303, 308, 320, 323, 331, 347, 356, 368.
- 36.** Chapter 036 — Awbeg's Cold Steppe (31065 BCE). Sources: References 1, 19, 21, 27, 102, 104, 124, 134, 153, 199, 204, 209, 222, 226, 232, 240, 277, 315, 332, 340, 347, 356, 369, 375.
- 37.** Chapter 037 — Doneraile's Marked Femur (31064 BCE). Sources: References 13, 49, 95, 104, 118, 123, 134, 153, 158, 186, 195, 205, 226, 247, 286, 303, 323, 332, 347, 360.
- 38.** Chapter 038 — The Last Drips at Crag Cave (31063 BCE). Sources: References 1, 13, 17, 25, 36, 47, 77, 80, 115, 123, 143, 173, 193, 211, 226, 269, 290, 323, 332, 356–357, 368.
- 39.** Chapter 039 — Fermanagh Beneath the Drumlins (31062 BCE). Sources: References 1, 12, 22, 27, 43–44, 69, 87, 102, 125, 159, 169, 204, 223–224, 226, 264, 277, 295, 324, 356, 365, 369.
- 40.** Chapter 040 — Fermanagh's Intertill Tundra (31061 BCE). Sources: References 1, 12–13, 48, 67, 123, 125, 134, 145, 186, 240, 270, 329, 332, 336, 346–347, 351, 356, 369.
- 41.** Chapter 041 — BIRM-166 Before Glaciation (31060 BCE). Sources: References 90, 100, 102, 118, 155, 158–159, 161–162, 205, 222, 249, 257, 273, 293, 302–303, 308, 323, 331, 356, 368.

- 42.** Chapter 042 — The Maguiresbridge Waterline (31059 BCE). Sources: References 1, 12, 26, 43, 68, 96, 116, 120, 143, 145, 166, 175, 192, 205, 218, 244, 262, 270, 292, 295, 321, 332, 364, 369.
- 43.** Chapter 043 — Derryvree's Sedge Country (31058 BCE). Sources: References 13, 25, 48, 61, 66, 100–101, 103, 118, 125, 146, 173, 226, 232, 238, 257, 266, 293, 323, 331, 350, 368.
- 44.** Chapter 044 — Hyaena Hall's Mammoth Bones (31057 BCE). Sources: References 1, 13, 23, 25, 47, 68, 71, 73, 95, 100, 134, 159, 205, 219, 226, 233, 323, 333, 347, 356.
- 45.** Chapter 045 — The Doneraile Limb Mark (31056 BCE). Sources: References 1, 22, 26, 45–47, 56, 64, 68–69, 75, 94, 105, 134, 143, 169, 175, 205, 218, 244, 323, 333, 347, 356.
- 46.** Chapter 046 — Derryvree's Enclosed Wetland (31055 BCE). Sources: References 12–13, 22, 25, 48, 60, 90, 103, 123, 126, 134, 155, 162, 177, 205, 299, 303, 323, 331, 336, 347, 356–357, 368.
- 47.** Chapter 047 — Fermanagh's Tundra Pool (31054 BCE). Sources: References 12, 22, 26, 43–44, 67, 69–70, 134, 143, 158, 162, 204, 219, 226, 243, 255, 292, 321, 325, 332, 356, 369.
- 48.** Chapter 048 — Mammoth Cave's Reindeer Question (31053 BCE). Sources: References 1, 27, 42, 47, 78, 104, 114, 124, 134, 145, 205, 222, 226, 252, 291, 309, 313, 318, 328, 332, 356, 358.
- 49.** Chapter 049 — Cork's Reindeer Hinterland (31052 BCE). Sources: References 13, 23, 25, 47–48, 52, 66, 103, 134–135, 139, 170, 173, 187, 205, 226, 244, 253, 278, 297, 323, 331.
- 50.** Chapter 050 — Bogbean at Derryvree (31051 BCE). Sources: References 1, 23, 43–44, 49, 76–77, 91, 134, 159, 196, 204, 232, 289, 295, 307, 332, 347, 356, 369.
- 51.** Chapter 051 — Fermanagh's Silt Window (31050 BCE). Sources: References 13, 19, 25, 37, 49, 65, 103, 123, 134, 149, 155, 162, 166, 205, 226, 229, 262–263, 303, 332, 344, 347, 356, 362.
- 52.** Chapter 052 — Castlepook's Reindeer Enquiry (31049 BCE). Sources: References 1, 6, 13, 25, 43–44, 69, 86, 123, 155, 201, 205, 209, 217, 231, 269, 292, 330–331, 336, 350, 368.
- 53.** Chapter 053 — Derryvree's Moss Ledger (31048 BCE). Sources: References 14, 18, 23, 27, 77, 80, 92, 134, 166, 175, 190, 205, 232, 267, 270, 283, 295, 303, 331, 356, 364, 370.
- 54.** Chapter 054 — Reindeer, Hyenas and Cave Mud (31047 BCE). Sources: References 5, 24, 27, 43, 104, 123, 132, 134, 137, 186, 190, 205, 219, 226, 295, 326, 333, 356, 359, 369.
- 55.** Chapter 055 — Doneraile's Reindeer Evidence (31046 BCE). Sources: References 13, 25, 103, 105, 123, 134, 139, 141, 205, 209, 222, 226, 231, 238, 271, 278, 311, 313, 316, 323, 332, 368.
- 56.** Chapter 056 — Castlepook's Faunal Archive (31045 BCE). Sources: References 1, 13, 23, 25, 95, 123, 134, 164, 186, 205, 209, 245, 297, 303, 322–323, 331, 356–357, 364.
- 57.** Chapter 057 — Elephant Hall's Bone Mosaic (31044 BCE). Sources: References 1, 26, 47, 56, 104, 123, 160, 182, 205, 209, 225, 237, 240, 256, 262–263, 281, 325, 332, 358.
- 58.** Chapter 058 — Derryvree Pools and Castlepook Reindeer (31043 BCE). Sources: References 1, 4, 13, 23, 25, 74, 107, 123, 125, 134, 155, 162, 173, 205, 247, 292, 303, 323, 333, 354, 357, 368.
- 59.** Chapter 059 — Crag Cave's Broken Stalagmites (31042 BCE). Sources: References 1, 13, 22, 25, 48, 63, 79, 92, 115, 134, 187, 205, 220, 226, 272, 284, 295, 315, 323, 331, 356, 368.
- 60.** Chapter 060 — Derryvree's Intertill Freshwater Series (31041 BCE). Sources: References 1, 12–13, 25, 80, 118, 127, 137, 157, 178, 205, 209, 243, 249, 257, 293, 315, 331, 347, 356.
- 61.** Chapter 061 — Derryvree's Mosses and Midges (31040 BCE). Sources: References 1, 13, 22, 25, 63, 67, 102, 157, 205, 222, 226, 232, 243, 257, 297, 321, 329, 332, 356–357, 364, 368.
- 62.** Chapter 062 — Cork's Reindeer Before Maximum (31039 BCE). Sources: References 13, 22, 25, 43, 46, 66, 108, 123, 134, 173, 205, 209, 226, 262, 270, 278, 281, 295, 323, 331, 356–357, 366, 371.

- 63.** Chapter 063 — Derryvree's Ice-Age Fen (31038 BCE). Sources: References 1, 7, 12, 25, 123, 134, 162, 205, 209, 226, 240, 247, 288, 303, 308, 315, 323, 332, 356, 368.
- 64.** Chapter 064 — Awbeg's Deep Cave Record (31037 BCE). Sources: References 25, 39, 59, 109, 123, 134, 149, 156, 159, 171, 205, 232, 253, 304, 332, 343, 347, 350, 364, 368.
- 65.** Chapter 065 — Castlepook's One Deep Mark (31036 BCE). Sources: References 1, 13, 22, 25, 39, 79, 123, 134, 181, 188, 204, 217, 225–226, 229, 232, 265, 323, 331, 356.
- 66.** Chapter 066 — Reindeer Femur, No Hearth (31035 BCE). Sources: References 9, 12, 22, 26, 36, 106, 126, 134, 145, 153, 169, 204, 209, 226, 241, 246, 263, 313, 325, 332, 347, 356.
- 67.** Chapter 067 — Derryvree's Trifoliate Fen (31034 BCE). Sources: References 10, 12, 22, 25, 33, 43, 66, 69, 92, 100, 123, 134, 205, 226, 297, 321, 327, 331, 356–357, 364, 368.
- 68.** Chapter 068 — BIRM-166's Moss Register (31033 BCE). Sources: References 8, 10, 13, 28, 66, 115, 120, 134, 155, 162, 189, 205, 226, 244, 266, 287, 295, 332, 347, 356, 367–368.
- 69.** Chapter 069 — Maguirebridge Between Tills (31032 BCE). Sources: References 12, 76–77, 104, 114–115, 123, 162, 186, 199, 205, 229, 258, 262, 295, 303, 319, 323, 331, 356.
- 70.** Chapter 070 — Derryvree's Sub-Drumlin Waters (31031 BCE). Sources: References 1, 13, 22–23, 27, 76, 80, 87, 153, 204, 209, 215, 218, 240, 283, 303, 333, 348, 356, 369.
- 71.** Chapter 071 — BIRM-166's Buried Freshwater (31030 BCE). Sources: References 13, 25, 43–44, 47, 69, 79, 85, 103, 115, 125, 134, 150, 166, 187, 196, 205, 226, 291, 293, 323, 332, 356.
- 72.** Chapter 072 — Castlepook's Reindeer Frontier (31029 BCE). Sources: References 1, 12, 23, 26, 47, 60, 124, 134, 153, 169, 175, 199, 205, 226, 232, 323, 332, 336, 347, 351, 356, 369.
- 73.** Chapter 073 — Derryvree's Two-Till Freshwater (31028 BCE). Sources: References 1, 12, 27, 105–106, 127, 134, 142, 145, 162, 193, 204, 255, 262, 326, 330, 332, 356, 358, 370.
- 74.** Chapter 074 — The Fermanagh Bogbean Record (31027 BCE). Sources: References 1, 13, 23, 25, 37, 43–44, 92, 123, 134, 170, 173, 177, 182, 205, 226, 243, 333, 347, 350, 356, 377.
- 75.** Chapter 075 — Castlepook's Lone Reindeer Mark (31026 BCE). Sources: References 1, 13, 25, 41, 110, 118, 123, 134, 153, 175, 205, 209, 224, 226, 231, 281, 308, 315, 323, 332, 343, 356.
- 76.** Chapter 076 — Cork Femur Beyond Fermanagh Drumlins (31025 BCE). Sources: References 1, 15, 22, 25, 43, 68–69, 92, 103, 123, 134, 187, 205, 224, 263, 279, 293, 316, 323, 333, 336, 347, 356.
- 77.** Chapter 077 — Derryvree's Muskeg Corridor (31024 BCE). Sources: References 1, 23, 27, 68, 90, 106, 134, 153, 162, 197, 205, 218, 235, 293, 326, 333, 344, 347, 356, 369.
- 78.** Chapter 078 — Mammoth Cave's Bone Archive (31023 BCE). Sources: References 1, 13, 25, 47, 68, 134, 138, 164, 180, 186, 205, 209, 226, 240, 293, 304, 317, 323, 331, 347.
- 79.** Chapter 079 — Bogbean, Hyena and Reindeer (31022 BCE). Sources: References 1, 13, 25, 43, 49, 69, 80, 134, 149, 162, 186, 204, 209, 226, 291–292, 313, 315, 333, 347, 356–357.
- 80.** Chapter 080 — Castlepook's Unsettled Femur (31021 BCE). Sources: References 1, 10, 16, 27, 58, 114, 134, 152, 158, 165, 177, 193, 204–205, 209, 226, 257, 278, 328, 332, 358, 369.
- 81.** Chapter 081 — Castlepook's Provisional Encounter (31020 BCE). Sources: References 2, 25, 63, 66, 72, 74, 95, 123, 128, 134, 170, 173, 208, 236, 246, 308, 316, 323, 331, 363, 368.
- 82.** Chapter 082 — Hyena Hall's Shifting Ground (31019 BCE). Sources: References 27, 47, 68, 73, 125, 129, 134, 143, 186, 205, 209, 222, 240, 249, 268, 293, 313, 329, 334, 369.
- 83.** Chapter 083 — Castlepook's Growing Ice Margin (31018 BCE). Sources: References 1, 25, 47, 104, 123, 134, 153, 182–183, 205, 226, 230, 240, 244, 298, 308, 315, 331, 339, 347, 353, 356.

- 84.** Chapter 084 — Derryvree's Arctic Herbarium (31017 BCE). Sources: References 1, 13, 25, 66, 89, 100, 103, 118, 123, 143, 205, 236, 259, 283, 292, 323, 333, 336, 351, 356, 363, 368.
- 85.** Chapter 085 — BIRM-166's Reindeer World (31016 BCE). Sources: References 13, 27, 43, 67, 77, 80, 87, 111, 125, 134, 153, 162, 240, 256, 291, 295, 315, 323, 333, 356, 364, 369.
- 86.** Chapter 086 — Derryvree's Brief Green Interval (31015 BCE). Sources: References 13, 25, 52, 123, 134, 145, 159, 182, 191, 205, 226, 232, 234, 253, 262, 308, 323, 331, 357, 373.
- 87.** Chapter 087 — Derryvree's Sedgebound Drumlin (31014 BCE). Sources: References 1, 13, 47, 49, 67, 78, 85, 99, 131, 154, 162, 186, 199, 204, 274, 312, 323, 328, 332, 337, 356, 358.
- 88.** Chapter 088 — Derryvree's Periglacial Poolscape (31013 BCE). Sources: References 1, 20, 22, 47, 49–50, 82–83, 125, 133, 151, 153, 159, 162, 205, 226, 303, 332, 347, 369.
- 89.** Chapter 089 — Maguirebridge Beneath Advancing Ice (31012 BCE). Sources: References 1, 20, 23, 25, 35, 43–44, 46, 125, 129, 134, 150, 202, 205, 207, 232, 249, 256, 262, 266, 273, 323, 333, 356–357.
- 90.** Chapter 090 — A Reindeer Bone at Castlepook (31011 BCE). Sources: References 1, 27, 47, 58, 67, 104, 126, 134, 150, 153, 205, 226, 232, 267, 303, 328, 333, 336, 351, 369.
- 91.** Chapter 091 — Derryvree's Moss and Meltwater (31010 BCE). Sources: References 1, 12, 25, 47, 78, 80, 112, 123, 134, 145, 193, 205, 209, 303, 313, 323, 331, 356–357, 368.
- 92.** Chapter 092 — Maguirebridge's Bogbean Waters (31009 BCE). Sources: References 1, 5, 10, 12, 23, 43–44, 46–47, 68, 97, 123, 134, 196, 218, 226, 254, 277, 333, 356.
- 93.** Chapter 093 — Derryvree's Bogbean Basin (31008 BCE). Sources: References 12, 25, 103, 106, 115, 117–118, 123, 134, 153, 172, 181, 205, 226, 250–251, 290, 306, 308, 323, 332, 356, 364.
- 94.** Chapter 094 — Castlepook's Carnivore Passage (31007 BCE). Sources: References 1, 16, 22, 34, 68, 134, 157, 159, 166, 186, 203–204, 218, 251, 256, 275, 293, 300, 303, 332, 355, 369.
- 95.** Chapter 095 — Castlepook's Reindeer Dilemma (31006 BCE). Sources: References 1, 25, 31, 77, 79, 86, 106, 115, 123, 134, 193, 221, 227, 244, 269–270, 323, 332, 347, 356, 363, 368.
- 96.** Chapter 096 — Maguiresbridge's Road-Cut Tundra (31005 BCE). Sources: References 13, 25, 36, 38, 43, 69, 80, 88, 93, 103, 123, 134, 182, 205, 226, 248, 293, 323, 331, 357, 368.
- 97.** Chapter 097 — Derryvree's Mosses and Mammoths (31004 BCE). Sources: References 1, 13, 25, 37, 43, 47, 66, 69, 79, 110, 123, 163, 205, 209, 217, 226, 292, 314, 323, 333, 356, 362.
- 98.** Chapter 098 — Castlepook's Thirty-Three-Millennia Fauna (31003 BCE). Sources: References 1, 25, 47, 66, 100, 134, 170, 178, 187, 198, 207, 209, 315, 323, 334, 336, 356–357, 364, 368.
- 99.** Chapter 099 — Hyena Hall's Open Country (31002 BCE). Sources: References 1, 12, 47, 53, 87, 124, 126, 134–135, 175, 205, 209, 226, 236, 295, 303, 315, 328, 334, 356, 358.
- 100.** Chapter 100 — Derryvree's Intertill Garden (31001 BCE). Sources: References 4, 36, 41, 52, 113, 123, 130, 134, 185, 204–205, 226, 241, 297, 302, 304, 331–332, 347, 357.

References

1. **2022:564 - Castlepook Cave, Castlepook South, Cork**
<https://excavations.ie/report/2022/Cork/0032564/>
2. **A 60,000 Year Greenland Stratigraphic Ice Core Chronology**
<https://doi.org/10.5194/cp-4-47-2008>
3. **A Critical Review and Re-Investigation of the Pleistocene Deposits at Blackhall Wood, County Kildare, Ireland**
https://nora.nerc.ac.uk/id/eprint/521184/1/Merritt%2520et%2520al%2520Text_Tables_Figure%2520Captions%2520PDF.pdf
4. **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/>
5. **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>
6. **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.2018.10.009>
7. **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>
8. **Advance and retreat of the marine-terminating Irish Sea Ice Stream into the Celtic Sea during the last glacial: Timing and maximum extent**
<https://durham-repository.worktribe.com/output/1305933/advance-and-retreat-of-the-marine-terminating-irish-sea-ice-stream-into-the-celtic-sea-during-the-last-glacial-timing-and-maximum-extent>
9. **Advances in Irish Quaternary Studies**
<https://link.springer.com/book/10.2991/978-94-6239-219-9>
10. **Aghnadarragh**
<https://www.habitas.org.uk/escr/site.asp?item=1>
11. **Aghnadarragh ASSI**
<https://www.daera-ni.gov.uk/protected-areas/aghnadarragh-assi>
12. **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
13. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
<https://doi.org/10.1098/rspb.1972.0018>
14. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
<https://royalsocietypublishing.org/doi/10.1098/rspb.1972.0017>
15. **A Middle Midlandian Freshwater Series at Derryvree, Maguiresbridge, County Fermanagh, Northern Ireland**
https://www.researchgate.net/publication/230161395_A_Middle_Midlandian_Freshwater_Series_at_Derryvree_Maguiresbridge_County_Fermanagh_Northern_Ireland
16. **An All-Ireland Quaternary Map**
<https://gsi.ie/publications/publication/an-all-ireland-quaternary-map/>
17. **An Inter-Till Freshwater Deposit at Hollymount, Maguiresbridge, Co. Fermanagh**
<https://www.habitas.org.uk/escr/site.asp?Item=486>
18. **A North-Western Habitat: the Paleoethology and Colonisation of a European Peninsula**
<https://intarch.ac.uk/journal/issue61/1/6.html>
19. **Anthropogenic Changes to the Holocene Nitrogen Cycle in Ireland**
<https://pmc.ncbi.nlm.nih.gov/articles/PMC6007156/>
20. **Archaeological excavations at Killuragh Cave, Co. Limerick**
<https://researchrepository.ucd.ie/rest/bitstreams/47195/retrieve>

21. 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/bitstreams/0fa70d1c-1476-4f2f-b49a-7a47c83c23bc/download>

22. Archaeological Heritage of County Cork 2020

<https://www.corkcoco.ie/sites/default/files/2023-06/archaeological-heritage-of-county-cork-2020.pdf>

23. Archaeology Research Excavation Grant 2022: Castlepook Cave, Co Cork

https://www.ria.ie/assets/uploads/2024/05/areg_2022_jennings_final_report_web_ready.pdf

24. Archaeology Research Excavation Grant Report 2023: Castlepook Caves Project

<https://www.ria.ie/assets/uploads/2024/10/AREG-2023-Richard-Jennings.pdf>

25. A reconsideration of the radiocarbon dating of the Marine Isotope Stage 3 fauna from southern Ireland

<https://doi.org/10.1111/bor.12451>

26. 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>

27. 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>

28. A Revised Correlation of Quaternary Deposits in the British Isles

<https://www.geolsoc.org.uk/bookshop/products/a-revised-correlation-of-quaternary-deposits-in-the-british-isles/>

29. 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>

30. A Stratigraphic Framework for Abrupt Climatic Changes During the Last Glacial Period Based on Three Synchronized Greenland Ice-Core Records

<https://research.aber.ac.uk/en/publications/a-stratigraphic-framework-for-abrupt-climatic-changes-during-the-/>

31. 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.2014.04.007>

32. 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.2014.09.007>

33. 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>

34. Autumn 2023 Newsletter

<https://www.qub.ac.uk/sites/uas/UASfilestore/Newsletters/UAS%20Newsletter%20Autumn%202023.pdf>

35. Behavioural Tendencies of the Last British–Irish Ice Sheet Revealed by Data–Model Comparison

<https://doi.org/10.1002/jqs.3628>

36. 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>

37. BRITICE-CHRONO Maps and GIS Data of the Last British-Irish Ice Sheet 31 to 15 ka

<https://doi.org/10.1594/PANGAEA.945729>

38. BRITICE-CHRONO Project Aims

<https://britice-chrono.sites.sheffield.ac.uk/project/aims>

39. 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>

40. BRITICE Glacial Mapping Project

<https://sheffield.ac.uk/geography-planning/research/geography/projects/britice>

41. British–Irish Ice Sheet and Polar Front History of the Goban Spur, Offshore Southwest Ireland Over the Last 250,000 Years

<https://doi.org/10.1111/bor.12631>

42. 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>

43. BSBI: *Menyanthes trifoliata*

<https://fermanagh.bsbi.org/menyanthes-trifoliata-l>

44. BSBI: *Salix herbacea*

<https://fermanagh.bsbi.org/salix-herbacea-l>

45. BSBI: *Saxifraga rosacea*

<https://fermanagh.bsbi.org/saxifraga-rosacea-moench>

46. BSBI: *Selaginella selaginoides*

<https://fermanagh.bsbi.org/selaginella-selaginoides-p-beauv>

47. Castlepook Cave

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/CK032_Cork_CGS_Castlepook_Cave.pdf

48. Castlepook Caves

https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf

49. Cenozoic: Tertiary and Quaternary (until 11,700 BP)

<https://files.core.ac.uk/download/pdf/297011667.pdf>

50. Changes in the Thermal Climate in Northwestern Europe during Marine Oxygen Isotope Stage 3, Estimated from Fossil Insect Assemblages

<https://www.cambridge.org/core/journals/quaternary-research/article/abs/changes-in-the-thermal-climate-in-northwestern-europe-during-marine-oxygen-isotope-stage-3-estimated-from-fossil-insect-assemblages-1/A462EB0D181C6B74B7F9038C279BD832>

51. Character of Advance and Retreat of the Southwest Sector of the British-Irish Ice Sheet

https://pure.ulster.ac.uk/files/103161153/Character_of_advance_Final_version.pdf

52. Character of Advance and Retreat of the Southwest Sector of the British-Irish Ice Sheet During the Last Glaciation

<https://doi.org/10.1016/j.quascirev.2022.107655>

53. 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>

54. Conserving Quaternary Geoheritage in Northern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0016787822000670>

55. Could Brown Bears (*Ursus arctos*) Have Survived in Ireland During the Last Glacial Maximum?

<https://pmc.ncbi.nlm.nih.gov/articles/PMC3730640/>

56. Could Brown Bears Have Survived in Ireland During the Last Glacial Maximum?

<https://pubmed.ncbi.nlm.nih.gov/23676655/>

57. County Geological Heritage Audit Reports

<https://www.gsi.ie/programmes-projects/geoheritage/geoheritage-activities/county-geological-heritage-audits/county-geological-heritage-audit-reports/>

58. Dansgaard–Oeschger Events in Climate Models: Review and Baseline Marine Isotope Stage 3 Protocol

<https://cp.copernicus.org/articles/19/915/2023/>

59. Deglacial Rates and Controls for the British-Irish Ice Sheet Western Margin

<https://pureadmin.uhi.ac.uk/ws/portalfiles/portal/15996924/jqs.3315.pdf>

60. 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/>

61. 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>

62. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland

<https://onlinelibrary.wiley.com/doi/full/10.1002/jqs.3077>

63. Deglaciation Chronology of the Donegal Ice Centre, North-West Ireland

<https://doi.org/10.1002/jqs.3077>

64. Devising Quality Assurance Procedures for Assessing and Reporting Cosmogenic-Nuclide Exposure Ages

<https://pure.uhi.ac.uk/files/15996924/jqs.3315.pdf>

65. Devising Quality Assurance Procedures for Assessment of Legacy Geochronological Data Relating to Deglaciation of the Last British-Irish Ice Sheet

<https://doi.org/10.1016/j.earscirev.2016.11.007>

66. Dimensions and Chronology of the Last Ice Sheet in Western Ireland

<https://doi.org/10.1016/j.quascirev.2007.10.019>

67. 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-ireland/>

68. Dimensions and Chronology of the Last Ice Sheet in Western Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379107003022>

69. Dryas octopetala

<https://fermanagh.bsbi.org/dryas-octopetala-l>

70. Dublin Radiocarbon Dates II

<https://www.cambridge.org/core/journals/radiocarbon/article/dublin-radiocarbon-dates-ii/91BB0CA450604FA2B3A216371DE762BE>

71. Dynamic Cycles, Ice Streams and Their Impact on the Extent, Chronology and Deglaciation of the British-Irish Ice Sheet

<https://www.research.ed.ac.uk/en/publications/dynamic-cycles-ice-streams-and-their-impact-on-the-extent-chronol/>

72. Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Margin of Northwest Ireland

<https://eprints.whiterose.ac.uk/140069/8/1-s2.0-S0277379117306157-main.pdf>

73. 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/>

74. Early Deglaciation of the British-Irish Ice Sheet on the Atlantic Shelf Northwest of Ireland Driven by Glacioisostatic Depression and High Relative Sea Level

<https://doi.org/10.1016/j.quascirev.2018.12.022>

75. 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>

76. Early Deglaciation of Western Ireland: Implications for the Last Irish Ice Sheet

<https://livrepository.liverpool.ac.uk/3033771/1/OCofaighetal2019Early%20deglaciation%20of%20western%20Ireland.pdf>

77. 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

78. Early Midlandian–Middle Midlandian, Pleistocene, Northern Ireland

https://earthwise.bgs.ac.uk/index.php/Early_Midlandian%E2%80%93Middle_Midlandian,_Pleistocene,_Northern_Ireland

79. 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>

80. 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>

81. ESCR Site Summary: Deposits of the Last Glaciation

<https://www2.habitas.org.uk/escr/summary.php?item=101>

82. 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>

83. Evidence for major British-Irish Ice Sheet expansion during Marine Isotope Stages 4 and 3 and implications for glacial-isostatic adjustment and high relative sea-levels

<https://www.aiqua.it/pdf/XXI-INQUA-ABSTRACT-BOOK-finale.pdf>

84. Explanation of Radiocarbon Results

<https://c14.arch.ox.ac.uk/explanation.php>

- 85. Exploring Controls of the Early and Stepped Deglaciation of the British-Irish Ice Sheet**
https://researchportal.plymouth.ac.uk/files/39237921/JQS-20-0108.R1_Benetti_Mar21.pdf
- 86. 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>
- 87. 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>
- 88. 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>
- 89. Exploring Controls of the Early and Stepped Deglaciation on the Western Margin of the British Irish Ice Sheet**
https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/23305/Benetti_2021_JQS_Exploring_CC.pdf?sequence=1
- 90. 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>
- 91. Exploring Controls of the Early and Stepped Deglaciation on the Western Sectors of the Last British-Irish Ice Sheet**
https://pure.bangor.ac.uk/ws/portalfiles/portal/37340552/JQS_20_0108.R1_Accepted.pdf
- 92. Exploring the Chronology of the Last British-Irish Ice Sheet: A Review of Previous Dating Attempts and New Constraints**
https://research-repository.st-andrews.ac.uk/bitstream/10023/23305/1/Benetti_2021_JQS_Exploring_CC.pdf
- 93. Exposure-age constraints on the extent, timing and rate of retreat of the last Irish Sea ice stream**
<https://doi.org/10.1016/j.quascirev.2010.04.002>
- 94. 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>
- 95. 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>
- 96. 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>
- 97. Extent and Retreat History of the Barra Fan Ice Stream Offshore Western Scotland and Northern Ireland During the Last Glaciation**
<https://www.sciencedirect.com/science/article/pii/S0277379118300507>
- 98. Extent and Timing of the Last Glacial Maximum (LGM) in Britain and Ireland: A Review**
<https://onlinelibrary.wiley.com/doi/10.1002/jqs.1404>
- 99. 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>
- 100. Extent and Timing of the Last Glacial Maximum in Britain and Ireland: a Review**
<https://doi.org/10.1002/jqs.1404>
- 101. Fast and Slow Components of Interstadial Warming in the North Atlantic During the Last Glacial**
<https://doi.org/10.1038/s43247-020-0006-x>
- 102. Field Guides**
<https://iqua.ie/publications/field-guides/>
- 103. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland**
<https://doi.org/10.1016/j.quascirev.2016.02.029>
- 104. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland**
<https://www.sciencedirect.com/science/article/pii/S0277379116300610>
- 105. 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/>
- 106. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland**
<https://mariondowd.com/wp-content/uploads/2025/04/2016-qsr-palaeolithic-ireland.pdf>
- 107. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland**
<https://doi.org/10.1016/j.quascirev.2016.07.010>

108. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.02.020>

109. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

https://clarecastleballyea.clareheritage.org/wp-content/uploads/sites/5/2025/03/First_evidence_of_a_Late_Upper_Palaeolit.pdf

110. First evidence of a Late Upper Palaeolithic human presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.03.012>

111. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379116300610>

112. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.012>

113. First Evidence of a Late Upper Palaeolithic Human Presence in Ireland

<https://doi.org/10.1016/j.quascirev.2016.07.011>

114. Freshwater organic deposits and stratified sediments between early and late Midlandian (Devensian) till sheets, at Aghnadarragh, County Antrim, Northern Ireland

<https://eurekamag.com/research/018/968/018968909.php>

115. Freshwater Organic Deposits and Stratified Sediments Between Early and Late Midlandian Till Sheets, at Aghnadarragh, County Antrim, Northern Ireland

<https://doi.org/10.1002/jqs.3390020104>

116. Geological Heritage Audit Report: County Cork

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Cork_Audit.pdf

117. Geological Mapping Programme

<https://www.gsi.ie/en-ie/programmes-and-projects/geological-mapping/Pages/default.aspx>

118. Geology of Ireland

<https://www.gsi.ie/geoscience-topics/geology/geology-of-ireland/>

119. 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/>

120. 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>

121. 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>

122. Growth and Retreat of the Last British-Irish Ice Sheet, 31,000 to 15,000 Years Ago: Open Access Version

<https://nora.nerc.ac.uk/id/eprint/533160/>

123. 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>

124. 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>

125. 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%90reconstruction/>

126. 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>

127. 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>

128. 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/bitstream/handle/10023/26038/Clark_2022_Boreas_Growth_retreat_CC.pdf?sequence=1

129. 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>

130. Growth and Retreat of the Last British–Irish Ice Sheet, 31,000 to 15,000 Years Ago: The BRITICE-CHRONO Reconstruction (Maynooth University Research Archive)

<https://mural.maynoothuniversity.ie/id/eprint/16632/>

131. Guide to the National Museum of Ireland

https://www.museum.ie/getmedia/a3ebbb22-2057-4200-aae8-cd958854d89f/ks_guide_web_en-%281%29.pdf

132. Guide to the National Museum of Ireland – Natural History

https://www.museum.ie/getmedia/e46732aa-23b9-459c-9522-0a8604f4df98/nhm_guide_web_en_1.pdf

133. Heinrich Events and the British-Irish Ice Sheet

https://edepositireland.ie/bitstream/handle/2262/102320/Thesis_SabrinaRenken_2023.pdf?isAllowed=y&sequence=1

134. Heritage Artefacts of County Cork 2021

<https://www.corkcoco.ie/sites/default/files/2023-06/heritage-artefacts-of-county-cork-2021.pdf>

135. IAH Ireland Field Trip 2014 Guide

<https://www.iah-ireland.org/field-guides/2014.pdf>

136. Ice Age - Overview

<https://www.arcgis.com/home/item.html?id=edac71eac0464f7b91e5657ce2ef642a>

137. Ice Age Ireland: Cool Fossils!

https://www.museum.ie/getmedia/acab45bf-2252-4f25-9cf0-c0268f0c7f0d/Ice_Age_Activity_Overview.pdf

138. Ice Age Ireland: Cool Fossils! Woolly Mammoth Activity Sheet

https://www.museum.ie/getmedia/48b32fce-19cc-4d70-8e6f-2cf2d7aff73f/Ice_Age_Activity_Mammoth.pdf

139. Ice Sheet Extension to the Celtic Sea Shelf Edge at the Last Glacial Maximum

<https://doi.org/10.1016/j.quascirev.2014.12.010>

140. Ice Sheet Limits and Chronostratigraphy in the Southern Sector of the Last Irish Ice Sheet

<https://infomar.ie/rd-and-education/publications/ice-sheet-limits-and-chronostratigraphy-southern-sector-last-irish>

141. IntCal20 Database

<https://intcal.org/curves/intcal20.14c>

142. IntCal: History

<https://intcal.org/history.html>

143. IntCal: International Radiocarbon Calibration

<https://www.intcal.org/>

144. IntCal Data

<https://www.intcal.org/data.html>

145. IntCal Publications

<https://www.intcal.org/publications.html>

146. IntCal Publications

<https://intcal.org/publications.html>

147. IntCal | RadioCarbon Dating Research | 14Chrono

<https://14chrono.org/research/intcal/>

148. Introduction: The Irish Stone Age

<https://www.cambridge.org/core/books/abs/irish-stone-age/introduction/BCAD1091A7D842CDAEF17DBEFE5FCD36>

149. Introduction to the Glacial Sand and Gravel Landscapes of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=439>

150. Introduction to the Late Quaternary and Holocene of Northern Ireland

<https://www.habitas.org.uk/escr/site.asp?Item=101>

151. Investigating Heritage and Climate Change in the Coastal and Maritime Environments of Wales and Ireland: A Guide to the CHERISH Toolkit

<https://www.cambridge.org/core/journals/advances-in-archaeological-practice/article/investigating-heritage-and-climate-change-in-the-coastal-and-maritime-environments-of-wales-and-ireland-a-guide-to-the-cherish-toolkit/4BEC64EB17461AC638BB34503494669A>

152. Investigating Seasonal Mobility in Irish Giant Deer (*Megaloceros giganteus* Blumenbach)

https://research-portal.uu.nl/files/139756950/J_Quaternary_Science_2022_Douw_Investigating_seasonal_mobility_in_Irish_giant_deer_Megaloceros_giganteus_Blumenbach_.pdf

153. Ireland: Submerged Prehistoric Sites and Landscapes

https://link.springer.com/chapter/10.1007/978-3-030-37367-2_11

154. Ireland: Submerged Prehistoric Sites and Landscapes

<https://www.vliz.be/imisdocs/publications/343799.pdf>

155. Ireland: Submerged Prehistoric Sites and Landscapes

https://doi.org/10.1007/978-3-030-37367-2_11

156. Ireland: Submerged Prehistoric Sites and Landscapes

<https://cora.ucc.ie/handle/10468/9883?show=full>

157. Ireland Through Geological Time

<https://www.gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/>

158. Ireland Through Geological Time

<https://gsi.ie/education/the-geology-of-ireland/ireland-through-geological-time/>

159. 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/>

160. Irish Cave Exploration

<https://www.nature.com/articles/012212b0>

161. Irish Fauna: Ground Floor

https://www.museum.ie/getmedia/cd11862c-a1a7-4691-a39f-d8f77f2268ea/nhm_guide_web_en.pdf

162. Irish Pleistocene Biostratigraphy

https://www.researchgate.net/publication/290822499_Irish_Pleistocene_biostratigraphy

163. Irish Pleistocene Biostratigraphy

<https://www.jstor.org/stable/30002348>

164. Irish Quaternary Vertebrates

https://doi.org/10.2991/978-94-6239-219-9_9

165. Irish Quaternary Vertebrates

<https://doi.org/10.1111/jbi.12220>

166. 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

167. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.05.003>

168. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.02.018>

169. 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>

170. 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>

171. Last Glacial Maximum Cirque Glaciation in Ireland and Implications for Reconstructions of the Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2016.05.002>

172. Late Midlandian, Pleistocene, Northern Ireland

https://earthwise.bgs.ac.uk/index.php/Late_Midlandian%2C_Pleistocene%2C_Northern_Ireland

173. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.011>

174. Late Pleistocene chronostratigraphy and ice sheet limits, southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.02.010>

175. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379110000132>

176. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://doi.org/10.1016/j.quascirev.2010.01.010>

177. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://durham-repository.worktribe.com/output/1486214>

178. Late Pleistocene Chronostratigraphy and Ice Sheet Limits, Southern Ireland

<https://intelligent-earth.ox.ac.uk/node/4030041>

179. Late Quaternary Stratigraphy and Glacial History of Southern Ireland – INQUA Field Guide

<https://durham-repository.worktribe.com/output/1120995/late-quaternary-stratigraphy-and-glacial-history-of-southern-ireland-inqua-field-guide>

180. 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>

181. 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>

182. Mammoth Cave (Castlepook Cave), County Cork

<https://irishcaves.ubss.org.uk/gazetteer/cork/mammoth-cave/>

183. Map and GIS database of glacial landforms and features related to the last British Ice Sheet

<https://doi.org/10.1111/j.1502-3885.2004.tb01246.x>

184. Marine20—The Marine Radiocarbon Age Calibration Curve (0–55,000 cal BP)

<https://doi.org/10.1017/RDC.2020.68>

185. Marine Isotope Stage 4 (71–57 ka) on the Western European Margin: Insights to the Drainage and Dynamics of the Western European Ice Sheet

<https://doi.org/10.1016/j.gloplacha.2023.104221>

186. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland

<https://www.sciencedirect.com/science/article/pii/S027737911530113X>

187. 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>

188. Maximum Extent and Dynamic Behaviour of the Last British–Irish Ice Sheet West of Ireland

<https://doi.org/10.1016/j.quascirev.2015.11.019>

189. Maximum extent and dynamic behaviour of the last British–Irish Ice Sheet west of Ireland

<https://doi.org/10.1016/j.quascirev.2015.10.019>

190. 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>

191. 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>

192. Mesolithic – Iron Age

<https://heritageireland.ie/articles/mesolithic-iron-age-8000bc-400ad/>

193. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://www.jstor.org/stable/30002377>

194. Middle Midlandian Interstadial Deposits at Greenagho, Near Belcoo, County Fermanagh, Northern Ireland

<https://www.jstor.org/stable/30002366>

195. Midlandian Cold Stage Deposits at Loop Head, Southern County Clare

https://www.burren geopark.ie/wp-content/uploads/2014/08/Midlandian_Cold_Stage_Deposits_at_Loop_Head_South.pdf

196. Myriophyllum alterniflorum

<https://fermanagh.bsbi.org/myriophyllum-alterniflorum-dc>

197. Natural History Division Acquisition Strategy

<https://source.museum.ie/en-IE/About/Corporate-Information/Policies-Guidelines/Natural-History-Division-Acquisition-Strategy>

198. New age constraints for the maximum extent of the last British-Irish Ice Sheet (NW sector)

<https://nora.nerc.ac.uk/id/eprint/21216/>

199. New data for the Last Glacial Maximum in Great Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/S0277379101001020>

200. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00102-0](https://doi.org/10.1016/S0277-3791(01)00102-0)

201. New Data for the Last Glacial Maximum in Great Britain and Ireland

[https://doi.org/10.1016/S0277-3791\(01\)00002-3](https://doi.org/10.1016/S0277-3791(01)00002-3)

202. New Data for the Last Glacial Maximum in Great Britain and Ireland

<https://pub.geus.dk/en/publications/new-data-for-the-last-glacial-maximum-in-great-britain-and-ireland/>

203. New Insights into Ireland's Ice Age Past From Castlepook Cave

<https://www.tickettailor.com/events/royalirishacademy/1858138>

204. New Insights on the Fauna of Ireland's Younger Dryas

https://clarecastleballiea.clareheritage.org/wp-content/uploads/sites/5/2025/03/New_insights_on_the_fauna_of_Irelands_Yo_compressed.pdf

205. New insights on the fauna of Ireland's Younger Dryas: its biogeography, ecology and extinctions

<https://doi.org/10.1016/j.quascirev.2024.108827>

206. 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>

207. 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>

208. NOAA/WDS Paleoclimatology: North GRIP Greenland Ice Core Chronology 2005, 60,000 Year, 20 Year Resolution

<https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=noaa-icecore-6086>

209. Occurrence of Mammalia Relicts at Site Castlepook Cave

<https://doi.pangaea.de/10.1594/PANGAEA.63585>

210. 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

211. On the Cave of Castlepook, Near Doneraile, Co. Cork

<https://doi.org/10.1017/S0016756800122435>

212. 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

213. On the Postglacial Isostatic Adjustment of the British Isles and the Shallow Viscoelastic Structure of the Earth

<https://academic.oup.com/gji/article/148/3/443/821518>

214. On the Postglacial Isostatic Adjustment of the British Isles and the Shallow Viscoelastic Structure of the Earth

<https://doi.org/10.1046/j.1365-246X.2002.01786.x>

215. Origin of British and Irish Mammals: Disparate Post-Glacial Colonisation and Species Introductions

<https://www.sciencedirect.com/science/article/pii/S0277379114002078>

216. Origins of Mammals in Ireland

https://biodiversityireland.ie/app/uploads/2021/11/Mammal_Atlas_web.pdf

217. 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>

218. 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>

219. Oscillating Retreat of the Last British-Irish Ice Sheet on the Continental Shelf Offshore Galway Bay, Western Ireland

<https://eprints.gla.ac.uk/206157/>

220. 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.2019.106039>

221. 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.2019.104014>

222. Outreach and Education Resources

<https://iqua.ie/outreach-and-education-resources/>

223. Outreach Links, Events and Exhibitions

<https://iqua.ie/outreach-and-education-resources/outreach-links-events-exhibitions/>

224. OxCal

<https://c14.arch.ox.ac.uk/oxcal.html>

225. OxCal

<https://c14new.arch.ox.ac.uk/oxcal.html>

226. Palaeoecology

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-16-600dpi.pdf>

227. Palaeolithic Ireland – New Evidence Emerges from the Emerald Isle

<https://www.ucl.ac.uk/human-evolution/news/2016/mar/palaeolithic-ireland-new-evidence-emerges-emerald-isle>

228. Pattern, Style and Timing of British–Irish Ice Sheet Advance and Retreat Over the Last 45,000 Years

<https://eprints.gla.ac.uk/234472/1/234472.pdf>

229. 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://doi.org/10.1002/jqs.3296>

230. Pattern, Style and Timing of British–Irish Ice Sheet Retreat: Shetland and Northern North Sea Sector

<https://doi.org/10.1002/jqs.3163>

231. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://doi.org/10.1016/j.quascirev.2010.07.019>

232. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://nora.nerc.ac.uk/id/eprint/507486/>

233. Pattern and Timing of Retreat of the Last British-Irish Ice Sheet

<https://www.sciencedirect.com/science/article/pii/S0277379110002817>

234. Periglacial Wedge-Casts and Patterned Ground in the Midlands of Ireland

<https://doi.org/10.55650/igj.1979.806>

235. Phylogeographic, ancient DNA, fossil and morphometric analyses reveal ancient and modern introductions of a large mammal: the complex case of red deer (Cervus elaphus) in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379112000856>

236. 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)

237. 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://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)

238. Phylogeographic, ancient DNA, fossil and morphometric analyses reveal ancient and modern introductions of a medium-sized mammal into Ireland

<https://doi.org/10.1016/j.quascirev.2012.02.012>

239. Pleistocene, Northern Ireland

https://earthwise.bgs.ac.uk/index.php/Pleistocene%2C_Northern_Ireland

240. Pleistocene Vertebrates in the British Isles

https://www.rhinosourcecenter.com/pdf_files/133/1336577813.pdf

241. Pleistocene Vertebrates in the British Isles

<https://rhinosourcecenter.com/wp-content/uploads/2012/04/1336577813.pdf>

242. Pleistocene Vertebrates in the British Isles

<https://www.rhinosourcecenter.com/wp-content/uploads/2012/04/1336577813.pdf>

243. Prehistoric Details

<https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

244. Prehistoric Details

<https://source.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-%281%29/Stone-Age/Prehistoric-Details>

245. 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)

246. Prehistoric Details

[https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-\(1\)/Stone-Age/Prehistoric-Details](https://cms.museum.ie/en-IE/Collections-Research/Irish-Antiquities-Division-Collections/Collections-List-(1)/Stone-Age/Prehistoric-Details)

247. Proceedings: Postglacial Colonisation Conference

<https://www.irishbiogeographicalsociety.com/pdf/OccPub1PostglacialConflBS.pdf>

248. Project Findings Provide Essential Insight into the Last British–Irish Ice Sheet

<https://www.bgs.ac.uk/news/project-findings-provide-essential-insight-into-the-last-british-irish-ice-sheet/>

249. Publications

<https://iqua.ie/publications/>

250. Quaternary

<https://gsi.ie/en-ie/data-and-maps/Pages/Quaternary.aspx>

251. Quaternary Deposits and Glacial Stratigraphy in Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S0277379187900084>

252. Quaternary Deposits and Glacial Stratigraphy in Ireland

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-29.pdf>

253. 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)

254. Quaternary Deposits and Glacial Stratigraphy in Ireland

<https://pure.ulster.ac.uk/en/publications/quaternary-deposits-and-glacial-stratigraphy-in-ireland-3>

255. Quaternary Geological Map of Ireland

https://inchheritage.org/dist/resources/Quaternary_500k_All_Ireland_Map.pdf

256. Quaternary Geology of Ireland

<https://www.gsi.ie/data-and-maps/quaternary/>

257. Quaternary Geomorphology

<https://www.gsi.ie/ga-ie/data-and-maps/Pages/Quaternary.aspx>

258. Quaternary Geomorphology 1:50,000 Ireland (ROI) ITM

<https://data.gov.ie/dataset/quaternary-geomorphology-150000-ireland-roi-itm/resource/dc0738d0-3460-487d-959b-f472cbcd164c>

259. Quaternary Geomorphology Map Service

https://gsi.geodata.gov.ie/server/rest/services/Quaternary/IE_GSI_Quaternary_Geomorphology_50K_IE26_ITM/MapServer

260. Quaternary Sediments 1:50,000 Ireland (ROI) ITM

<https://data.gov.ie/dataset/quaternary-sediments-150000-ireland-roi-itm/resource/9d047f76-be26-4aff-b3c5-07138334a408>

261. Quaternary Sediments 1:50,000 Map Viewer

https://gsi.geodata.gov.ie/server/rest/services/Quaternary/IE_GSI_Quaternary_Sediments_50K_IE26_ITM/FeatureServer

262. Quaternary Site Descriptions

<https://iqua.ie/wp-content/uploads/2020/10/Quaternary-sites-of-Ireland-map-INQUA-2019.pdf>

263. Radiocarbon, Volume 16, Number 1: Geological Sample D-122, Castlepook 1

<https://journals.uair.arizona.edu/index.php/radiocarbon/article/viewFile/381/386>

264. Radiocarbon Calibration

<https://c14.arch.ox.ac.uk/calibration>

265. Radiocarbon Calibration

<https://www.oxcal.org/calibration.html>

266. 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>

267. 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>

268. 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>

269. Radiocarbon Constraints on the History of the Western Irish Ice Sheet Prior to the Last Glacial Maximum

<https://doi.org/10.1130/G23167A.1>

270. 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/>

271. Reconstructing the Last Irish Ice Sheet 2: A Geomorphologically-Driven Model of Ice Sheet Growth, Retreat and Dynamics

<https://www.sciencedirect.com/science/article/abs/pii/S0277379109003163>

272. Reconstruction and ³⁶Cl Based Geochronology of the Deglaciation of Central Ireland

<https://eprints.gla.ac.uk/381095/>

273. 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/>

274. Reindeer Bone Found in North Cork to Alter Understanding of Irish Human History

<https://www.irishexaminer.com/news/arid-40269116.html>

275. Release of 3 New Quaternary Maps

<https://www.gsi.ie/en-ie/events-and-news/news/Pages/Release-of-3-New-Quaternary-Maps.aspx>

276. 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/>

277. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

<https://www.sciencedirect.com/science/article/abs/pii/S0277379112000029>

278. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

<https://doi.org/10.1016/j.quascirev.2012.01.001>

279. Response of the Irish Ice Sheet to Abrupt Climate Change During the Last Deglaciation

https://www.researchgate.net/publication/257110370_Response_of_the_Irish_Ice_Sheet_to_abrupt_climate_change_during_the_last_deglaciation

280. Revealing the Past 2023: In Search of the Elusive Palaeolithic in Ireland

<https://www.ria.ie/video/revealing-the-past-2023-in-search-of-the-elusive-palaeolithic-in-ireland/>

281. 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/>

282. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

<https://doi.org/10.64898/2026.07.10.737191>

283. Sedimentary Ancient DNA Reveals Late Pleistocene Faunal Connectivity Between Ireland and Eurasia

<https://www.biorxiv.org/content/10.64898/2026.07.10.737191v1>

284. 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>

285. Sedimentology and Chronology of the Advance and Retreat of the Last British-Irish Ice Sheet on the Continental Shelf West of Ireland

<https://eprints.gla.ac.uk/121683/>

286. Sedimentology of Late Glacial Clays in Lacustrine Basins, Central Ireland

<https://www.sciencedirect.com/science/article/abs/pii/S027737919700022X>

287. Sensitivity of the North Atlantic circulation to break-up of the marine sectors of the NW European ice sheets during the last Glacial: A synthesis of modelling and palaeoceanography

<https://doi.org/10.1016/j.gloplacha.2012.09.010>

288. Soils of County Waterford

<https://teagasc.ie/wp-content/uploads/2025/05/Waterford.pdf>

289. Soils of County Waterford

<https://www.teagasc.ie/media/website/publications/2011/Soils-of-Co-Waterford-WEB.pdf>

290. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://doi.org/10.5194/cp-21-261-2025>

291. Spatio-Temporal Dynamics of Speleothem Growth and Glaciation in the British Isles

<https://cp.copernicus.org/articles/21/261/2025/>

292. Spotted Hyena Skull

<https://cms.museum.ie/en-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4>

293. Spotted Hyena Skull

<https://cms.museum.ie/ga-IE/Collections-Research/Collection/Documentation-Discoveries/Artefact/Spotted-Hyena-Skull/a8990d9b-84a9-4107-99b7-f3a8cc17a7d4>

294. Stoats (*Mustela erminea*) provide evidence of natural overland colonization of Ireland

<https://pmc.ncbi.nlm.nih.gov/articles/PMC2176200/>

295. 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/>

296. 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>

297. 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>

298. Studies on the Early Settlement of Scotland and Ireland

<https://www.sciencedirect.com/science/article/pii/S1040618297000505>

299. The Archaeology of Caves in Ireland

<https://caves.org/journal-of-cave-and-karst-studies/jcks-articles/the-archaeology-of-caves-in-ireland-2/>

300. The Brown Bear (*Ursus arctos* L.) in Ireland

https://www.researchgate.net/publication/379235493_The_Brown_Bear_Ursus_arctos_L_in_Ireland

301. The Burren

<https://www.geolsoc.org.uk/science-and-policy/100-great-geosites/landscape/the-burren/>

302. The Castlepook Cave Project

<https://www.corkcoco.ie/sites/default/files/2023-05/county-cork-heritage-grant-scheme-2023-1.pdf>

303. The Colonization of Ireland: A Human Ecology Perspective

<https://doi.org/10.1016/j.quascirev.2020.106632>

304. The Colonization of Ireland: A Human Ecology Perspective

https://hungarcolab.weebly.com/uploads/1/3/0/2/130279092/tune_2020_-_colonization_of_ireland.pdf

305. The Colonization of Ireland: A Human Ecology Perspective

<https://www.sciencedirect.com/science/article/abs/pii/S0277379120305941>

306. The Colonization of Ireland: A Human Ecology Perspective

<https://www.sciencedirect.com/science/article/pii/S0277379120305941>

307. The Deglaciation of the Western Sector of the Irish Ice Sheet

<https://eprints.whiterose.ac.uk/161427/1/bor.12448.pdf>

308. 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>

309. 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>

310. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to Its Terrestrial Margin

<https://doi.org/10.1002/esp.4686>

311. The Deglaciation of the Western Sector of the Irish Ice Sheet from the Inner Continental Shelf to its Terrestrial Margin

<https://eprints.whiterose.ac.uk/id/eprint/161427/1/bor.12448.pdf>

312. The Dungarvan Valley Caves Project: Second Interim Report

<https://researchonline.ljmu.ac.uk/id/eprint/14937/1/The%20Dungarvan%20Valley%20Caves%20Project%20Second%20interim%20report..pdf>

313. The Exploration of Castlepook Cave, Co. Cork. With 3 Plates.

https://sources.nli.ie/Record/PS_UR_073459

314. The Exploration of Castlepook Cave, Co. Cork. With 3 Plates.

https://sources.nli.ie/Record/PS_UR_073459/Details?lng=en&print=1&sid=111354

315. The Exploration of Castlepook Cave, County Cork

https://upload.wikimedia.org/wikipedia/commons/d/da/Proceedings_of_the_Royal_Irish_Academy_%28IA_proceedingsofro34roya%29.pdf

316. 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>

317. The Exploration of Castlepook Cave, County Cork: Bibliographical Record

https://upload.wikimedia.org/wikipedia/commons/a/a2/Geological_magazine_%28IA_geologicalmagazi651918wood%29.pdf

318. The Geological Heritage of County Leitrim

https://gsi.geodata.gov.ie/downloads/Geoheritage/Reports/Leitrim_Audit.pdf

319. 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>

320. The Ice Age in Ireland

<https://www.askaboutireland.ie/narrative-notes/the-ice-age-in-ireland/index.xml>

321. The IntCal20 Approach to Radiocarbon Calibration Curve Construction: A New Methodology Using Bayesian Splines and Errors-in-Variables

<https://eprints.gla.ac.uk/217180/>

322. 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>

323. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP)

<https://doi.org/10.1017/RDC.2020.41>

324. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)

<https://www.cambridge.org/core/journals/radiocarbon/article/intcal20-northern-hemisphereradiocarbon-age-calibration-curve-055-cal-kbp/83257B63DC3AF9CFA6243F59D7503EFF>

325. 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>

326. 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>

327. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)

<https://epic.awi.de/id/eprint/53055/1/reimer2020r.pdf>

328. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 kcal BP)

<https://eprints.gla.ac.uk/210753/>

329. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve PDF

<https://www.cambridge.org/core/services/aop-cambridge-core/content/view/83257B63DC3AF9CFA6243F59D7503EFF/S003382220000417a.pdf/div-class-title-the-intcal20-northern-hemisphere-radiocarbon-age-calibration-curve-0-55-cal-kbp-div.pdf>

330. The Irish Quaternary Association

<https://iqua.ie/>

331. 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)

332. The Irish Quaternary Fauna Project

https://www.researchgate.net/publication/223448450_The_Irish_Quaternary_Fauna_Project

333. The Irish Quaternary Fauna Project

<https://www.sciencedirect.com/science/article/pii/S0277379196000376>

334. The Irish Quaternary Fauna Project

<https://www.sciencedirect.com/science/article/abs/pii/S0277379196000376>

335. The Irish Quaternary Fauna Project

[https://doi.org/10.1016/S0277-3791\(97\)00018-7](https://doi.org/10.1016/S0277-3791(97)00018-7)

336. The Island of Ireland: Drowning the Myth of an Irish Land-Bridge?

<https://www.tara.tcd.ie/items/af898505-9836-458c-a5d6-78ce11d608ab>

337. The Last Eurasian Ice Sheets – A Chronological Database and Time-Slice Reconstruction, DATED-1

<https://doi.org/10.1111/bor.12142>

338. The Last Glacial Maximum

<https://doi.org/10.1126/science.1172873>

339. The Last Glacial Maximum British–Irish Ice Sheet: a reconstruction using digital terrain mapping

<https://doi.org/10.1002/jqs.1143>

340. The Last Irish Ice Sheet: Extent and Chronology

https://www.researchgate.net/publication/309313799_The_Last_Irish_Ice_Sheet_Extent_and_Chronology

341. The Last Irish Ice Sheet: Extent and Chronology

https://www.researchgate.net/publication/320484006_The_Last_Irish_Ice_Sheet_Extent_and_Chronology

342. The Last Irish Ice Sheet: Extent and Chronology

https://doi.org/10.2991/978-94-6239-219-9_5

343. 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/>

344. 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>

345. The Late Quaternary History of East-Central Ireland

<https://doi.org/10.1017/S0016756809990055>

346. The Mammoth Caves of Castlepook, Near Doneraile

<https://corkhist.ie/wp-content/uploads/jfiles/1905/b1905-003.pdf>

347. The Mesolithic in Ireland: When Was It?

<https://www.heritagecouncil.ie/content/files/Our-Ancient-Landscapes-Hunter-Gatherers-in-Ireland.pdf>

348. 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>

349. The Nature of MIS 3 Stadial–Interstadial Transitions in Europe: New Insights from Model–Data Comparisons

<https://doi.org/10.1016/j.quascirev.2011.10.002>

350. 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)

351. The Problem of a Late Quaternary Landbridge Between Britain and Ireland

<https://www.sciencedirect.com/science/article/pii/0277379185900289>

352. The Quaternary History of Ireland

<https://catalogue.nli.ie/Record/vtls000090300>

353. The Quaternary of the Irish Midlands

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-21-300dpi-OCR.pdf>

354. The Quaternary of Western Ireland

<https://people.tcd.ie/Profile?Username=PCOXON>

355. The Stratigraphic Position and Age of the Gortian

https://www.burrengeopark.ie/wp-content/uploads/2014/08/GSI-The_Stratigraphic_Position_and_Age_of_the_Gor.pdf

356. The subdivision of the Quaternary Period in Ireland

<https://iqua.ie/wp-content/uploads/2021/09/IQUA-Guide-17-unlocked.pdf>

357. The Timing and Magnitude of the British–Irish Ice Sheet Between Marine Isotope Stages 5d and 2

<https://doi.org/10.1002/jqs.3611>

358. 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>

359. 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>

360. Timing, Pace and Controls on Ice Sheet Retreat: an Introduction to the BRITICE-CHRONO Transect Reconstructions of the British-Irish Ice Sheet

<https://livrepository.liverpool.ac.uk/3124997/>

361. Timing, Pace and Controls on Ice Sheet Retreat: An Introduction to the BRITICE-CHRONO Transect Reconstructions of the British–Irish Ice Sheet

<https://onlinelibrary.wiley.com/doi/10.1002/jqs.3326>

362. 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>

363. 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>

364. 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>

365. 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>

366. Timing and Pace of Ice-Sheet Withdrawal Across the Marine–Terrestrial Transition West of Ireland During the Last Glaciation

<https://research-repository.st-andrews.ac.uk/handle/10023/22990>

367. Timing and pace of ice-sheet withdrawal across the marine–terrestrial transition west of Ireland during the last glaciation

<https://eprints.gla.ac.uk/234542/1/234542.pdf>

368. Trimlines, blockfields and the vertical extent of the last ice sheet in southern Ireland

<https://doi.org/10.1111/bor.12109>

369. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://onlinelibrary.wiley.com/doi/10.1111/bor.12109>

370. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

https://www.researchgate.net/publication/271141377_Trimlines_blockfields_and_the_vertical_extent_of_the_last_ice_sheet_in_Southern_Ireland

371. Trimlines, Blockfields and the Vertical Extent of the Last Ice Sheet in Southern Ireland

<https://research-repository.st-andrews.ac.uk/handle/10023/6021>

372. UCD School of Archaeology Research Day 2022

https://www.ucd.ie/archaeology/t4media/UCD_Archaeology_Research_Day_2022.pdf

373. Using Novel Methods to Track British and Irish Ice Sheet Dynamics Since the Late Pleistocene, Along the West Porcupine Bank, NE Atlantic

<https://doi.org/10.1016/j.quascirev.2022.107463>

374. 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>

375. What Is the Quaternary?

<https://iqua.ie/wp-content/uploads/2018/08/IQUA-Leaflet-Final.pdf>

376. What Was on the Menu in Prehistoric Ireland?

<https://www.rte.ie/brainstorm/2025/0815/1475736-prehistoric-ireland-food-mesolithic-iron-age-bronze-age/>

377. Who Lived in Ireland Before Neolithic Times?

https://cms.nationalmuseumsni.org/sites/default/files/2022-09/nmni-ancient-ireland-3-who-lived-in-ireland-before-neolithic-times_0.pdf

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